

The Future of Small Farms

Proceedings of a Research Workshop
Wye, UK
June 26-29, 2005

Jointly organized by
International Food Policy Research Institute (IFPRI) / 2020 Vision Initiative
Overseas Development Institute (ODI)
Imperial College, London

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This volume includes (i) papers prepared for presentation at the workshop and subsequently revised and edited; (ii) remarks by commentators that have been transcribed and edited; (iii) summary notes of discussions in each session; and (iv) miscellaneous information such as the program, list of participants, and background notes.

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Foreword

Small farmers are one of the more disadvantaged and vulnerable groups in the developing world—half of the world's undernourished people, three-quarters of Africa's malnourished children, and the majority of people living in absolute poverty can be found on small farms. If the United Nations Millennium Development Goals for poverty and hunger are to be achieved, governments and donors need to shift their attention to developing agriculture in general and strengthening small farms in particular. The task is especially challenging given recent changes in the global political and economic environment, as well as ongoing processes of globalization and integration of agricultural and food markets.

With these challenges in mind, the International Food Policy Research Institute (IFPRI), the Overseas Development Institute (ODI), and Imperial College London came together to organize "The Future of Small Farms" research workshop. The participants met June 26–29, 2005, in Wye, England, with the objectives of better understanding the changing context of small farms, in view of the recent and often contending research findings on this topic, and providing analytical substance to the ongoing policy discussions.

We are grateful to Professor Sir Gordon Conway, FRS, Chief Scientific Adviser at the U.K. Department for International Development (DFID), for inaugurating the workshop and providing a thoughtful introduction highlighting the need to promote productivity increases in agriculture and outlining key areas for action and research gaps.

The workshop focused on seven key themes:

- The role of agriculture in pro-poor growth
- Market opportunities: markets, trade, and competitiveness
- Smallholder farming in difficult circumstances
- Employment, migration, and the nonfarm economy
- Productivity of small farms: technology and innovation
- Services, institutions, intermediation: new directions
- Policies and politics for smallholder agriculture

Given the strong research orientation of the workshop, its key objective was to obtain a detailed overview of the main debates taking place in the academic world around the issue of small farms. Hence, the workshop was designed to juxtapose issues and views. In some cases, two presenters with opposing views were asked to present on an issue, with discussants attempting to identify common ground and reasons for disagreement. The final session was dedicated to synthesizing the main arguments and areas of agreement and disagreement developed during the three days of discussions and to drawing policy recommendations. A highlight of the final session featured a lively debate between IFPRI's Peter Hazell and ODI's Simon Maxwell. A total of 65 prominent representatives from academic, policymaking, and donor circles in the United States, the United Kingdom, Africa, Asia, and Latin America as well as civil society representatives took part in the workshop, sharing their views on the situation and engaging in frank, insightful, and broad-ranging discussions.

This volume presents proceedings of "The Future of Small Farms" workshop, including the papers and presentations from each session, discussants' remarks, and summaries of open discussion. Results of the participant surveys conducted during the workshop and selected background materials are included as well. We hope that the proceedings will shed light on the debate and stimulate further research where needed, as well as contribute to informed policymaking for pro-poor growth strategies.

In an effort to distribute the workshop's findings and conclusions, we shall prepare a synthesis paper that will provide a review of discussions, agreements, and recommendations for policymakers, as well as knowledge gaps and priorities for future research. In addition, selected

papers from the workshop will be compiled and submitted for a special journal issue of *Food Policy*. The collaborating institutions will take the lead in organizing follow-up policy seminars with partners to present the discussion results and the synthesis document to key stakeholder groups in Africa, the United Kingdom, the United States, and Europe.

The collaborating partners gratefully acknowledge the support of the U.K. Department for International Development (DFID) and the U.S. Agency for International Development (USAID) in organizing the workshop and follow-up activities. We warmly thank the workshop participants for fully engaging in rich and stimulating discussions and the authors in particular for preparing comprehensive papers and leading the sessions with their insightful presentations. We also express our sincere appreciation to Oksana Nagayets, Morgane Danielou, and Djhoanna Cruz, research analyst, communications specialist, and administrative coordinator, respectively at IFPRI, for their superb support throughout the workshop preparation and implementation as well as in compiling the proceedings volume. We gratefully acknowledge the excellent logistical support provided by Sara Harden, conference administrator at Imperial College.

We hope this volume conveys the richness of the tremendously successful workshop, stimulates further exchange of ideas, and promotes concrete policy steps to facilitate a viable and prosperous future for small farmers.

Rajul Pandya-Lorch, *Head, 2020 Vision Initiative, and Chief of Staff, Director General's Office, International Food Policy Research Institute*

Peter Hazell, *Senior Institute Fellow, International Food Policy Research Institute*

Steve Wiggins, *Research Fellow, Rural Policy and Governance Group, Overseas Development Institute*

Colin Poulton, *Research Fellow, Centre for Development and Poverty Reduction, Imperial College London*

Andrew Dorward, *Director, Centre for Development and Poverty Reduction, and Reader, Agricultural Development Economics, Imperial College London*

Session 1
The Role of Agriculture in Pro-Poor Growth

Reflections on the Role of Agriculture in Pro-Poor Growth*

Alberto Valdés, Independent Consultant and Research Associate, Universidad Católica de Chile
William Foster, Professor, Universidad Católica de Chile

1. Introduction

There is a long history in economic development with regard to the roles of various sectors in development and the choice of strategic sectors for development. This paper is principally concerned with reviewing recent empirical studies on the contribution of agriculture to national growth and to poverty reduction. The outcomes of interest are economywide, although we are examining the agriculture sector's performance in relation to the rest of the economy. There have been numerous country case studies, which are useful at bringing light to this question, but we will mainly concern ourselves with the evidence from cross-country comparisons.

Before we take up the specific question of the potential contributions of agriculture as a sector, section 2 presents an overview of the general question of overall growth's influence in reducing poverty. We consider that agriculture's principal role in poverty reduction is through its long-term contribution to national development; although over time the sector's gross domestic product (GDP) size and its importance in income generation relative to the rest of the economy will decline. The third section turns to accounting for the linkages that agriculture might have with the rest of the economy: How integrated is farming with other sectors? The answer gives some idea of the potential for agriculture to have positive spillovers on other sectors' growth. Without such linkages it is doubtful that agriculture could contribute to pro-poor growth beyond simply the expansion of its own GDP. The fourth and fifth sections examine recent econometric evidence of the contribution of agriculture to national growth and poverty reduction. Cross-country studies show that, on average, for developing countries agriculture tends to have an impact on both national growth and poverty reduction that is greater than its simple share in national GDP.

The sixth section discusses the policy implications of the evidence showing the importance of agriculture in national development and poverty alleviation. One implication is *not* to subsidize farm production, but to account for its high contribution relative to its size in the allocation of public goods. We address the question of the composition of public expenditures, both in terms of agriculture versus nonagricultural expenditures, and in terms of the mix of rural spending between private subsidies and public good provision.

The seventh section turns from addressing the comparative role of agriculture as a sector in promoting growth and poverty reduction to the question of the improvement of the incomes of poor households, both rural and urban. For poor households within the rural economy there are both farming and nonfarming households. We discuss the broader perspective of maximizing the contribution of rural public policies to poverty alleviation, which means thinking beyond agriculture to the rural economy, and beyond saving small farms to sustainable employment generation (in rural areas and via migration). We do not suggest ignoring agriculture or small farmers and forgetting about policies directed at small farmers, but we wish to underline that a successful poverty reduction strategy is not the same thing as saving the small farmer forever and everywhere.

In the final section, we consider that with respect to small farmers in the developing world, governments and those interested in pro-poor development must deal with what exists in terms of millions of small farms in the developing world. Because the goal is not to maintain millions of small farmers but to eliminate poverty, one would wish for dynamic overall economic growth (enhanced by and enhancing agricultural growth) that also offers better nonfarm income opportunities to all rural families. However, a dynamic overall economy or global growth might drive changes in the structure of agricultural production to larger and more sophisticated farmers but might not provide opportunities

* The authors gratefully acknowledge the comments of participants at "The Future of Small Farms" workshop, where this paper was presented.

to some of the rural poor, who remain as small farmers without being able to take advantage of nonfarm employment opportunities for geographic, demographic, and cultural reasons and labor market restrictions. This leads to a discussion of safety nets, especially programs that focus on family incomes rather than farm-related support. Perhaps the most important point of such programs is to support the long-term human capital investments in children. To what degree can least-developed countries finance and implement such safety nets? The answer is probably to a small degree without rapid growth, in which the agricultural sector's role appears to be important.

2. Importance of Overall Growth to Poverty Reduction

A large body of recent economic literature addresses the relationships between growth and poverty reduction. Dollar and Kraay's paper "Growth Is Good for the Poor" (2002) provoked wide debate by documenting the empirical regularity between growth and poverty using panel data from 92 countries over the last four decades. Their analysis concludes that, on average, the mean income of a country's poorest quintile rises and falls at the same rate as average national income. The growth elasticity of poverty¹ (poverty rates measured by headcount) has an estimated value of 1. Moreover, other policy-related factors usually considered important to reduce poverty, such as public expenditures on health and education and improvements in labor productivity in agriculture, were found to have little marginal effect on the average income of the poorest.

The controversies sparked by Dollar and Kraay's findings have surrounded such questions as the role of inequality in determining the importance of growth for the poor and the impact of education on poverty, after controlling for per capita income and other variables. Tsangarides, Ghura, and Leite (2000) confirm that growth raises the income of the poor, but the relationship is typically less than one-to-one, implying that a simple pro-growth strategy to lower poverty could increase the disparity between the poor and the average population. While Ravallion (2001) confirms that overall growth reduces the poverty rate (measured by headcount), he notes that the degree to which the poor share in growth varies widely from country to country. He finds that the ability of the poor to enjoy the benefits of growth is especially sensitive to the initial conditions of a country's economy, in particular to the degree of income inequality. Ravallion reports a 95 percent confidence interval for the growth elasticity of poverty (unadjusted by inequality effects) between 0.6 and 3.5. He further estimates a poverty elasticity with respect to distribution-corrected rate of growth in the range of 1 percent for relatively high-inequality countries (Gini of 0.60) and about 2 percent for relatively low-inequality countries (Gini of 0.3).

Gundlach, Pablo, and Weisert (2004) critique the Dollar and Kraay finding that income of the poor is not systematically related to expenditures on education. Public expenditures on education could be a poor measure of the formation of human capital, and would not reflect the impact of education itself on poverty reduction. The Gundlach, Pablo, and Weisert cross-country study finds that education is not distribution neutral, and thus educational attainment (not necessarily education expenditures) may allow the poor to benefit from growth to a greater extent. Tsangarides, Ghura, and Leite (2000) also give evidence that higher educational status (along with lower inflation, lower government consumption, and higher levels of financial sector development) would be a component of a "super pro-poor" strategy to both raise the incomes of the poor and lessen income disparities.

This cross-country growth perspective is highly consistent with the literature on household survey analysis, where one finds a broad consensus that education is important for raising poor household incomes. Analyses of household surveys almost always show raising returns to education, although those returns, of course, are influenced by education quality, parents' schooling, and other variables. Importantly for the rural poor, the returns to education depend also on the activities in which that education might be applied. Returns to schooling are higher in urban areas than in rural areas, and higher for nonfarm activities than for farming (for Latin America, see Lopez and Valdés

¹ The term *growth elasticity of poverty* refers to the change in the poverty rate (headcount) with respect to a 1 percent increase in average income.

2000). We emphasize the impact of education here, because we wish to direct our ultimate attention less toward agriculture and small farming and more toward the final desire of attaining pro-poor growth.

Despite the controversies surrounding the magnitude of the impact of growth on poverty, and the importance of other variables such as education, there is *no* question regarding the direction of the impact of growth on poverty overall. Even taking Ravallion's (2004) worst inequality scenario (which is often the case in middle-income countries), the growth poverty elasticity is still around 0.6. Although a low number, making growth in the case of high inequality, as Ravallion comments, a "blunt instrument against poverty," it does not suggest ignoring growth. And in fact, Ravallion (2004) finds poverty rate elasticities as high as 4.3, suggesting that most countries would have elasticities greater than 1 (mean Ginis are around 0.43). (Using a different measure of poverty impact—the average income of the poorest quintile—Dollar and Kraay find an elasticity of growth equal to 1.) Moreover, as Heltberg (2004) and others note, the dichotomy between growth and redistribution is misleading for many countries, perhaps most. And policy-induced redistribution (as measured by the income Gini) has limited potential in most circumstances.

Moreover, as Lopez (2004) notes, we know that policies affect average income growth, that average income growth affects poverty, and that income distribution affects the influence of growth on poverty. But we do not know how policy affects income distribution and how income distribution affects growth. And as a cautionary note, as Bigsten and Levin comment in their review of the literature regarding the relationships between growth, distribution, and poverty, "there could be a conflict between short-term distributional measures [i.e., policies] and immediate poverty reduction on the one hand, and long-term growth-supporting measures and long-term poverty reduction, on the other hand. But there may also be win-win situations, where a policy for equity has a beneficial effect on growth." Such win-win policies involve improving the assets of the poor (importantly education) and helping households cope with risk (safety nets).

Therefore it appears that the case is strong that sustained growth remains a necessary condition for poverty reduction. The lesson we learn from the literature is that economic growth can be more pro-poor in some circumstances and less in others, and that less inequality is better than more. But just by itself, growth is pro-poor. Our questions then become *What can agriculture do to promote overall growth?* And *What is the policy environment that can assist agriculture in promoting overall growth?* As we will see in the following sections, agriculture can promote growth directly through its own expansion, and indirectly through its spillovers to the rest of the economy. We will also see that agricultural growth in contrast to nonagricultural growth can contribute differentially to the increase in the income of the poorest, and sometimes its contribution to income growth of the poorest exceeds its relative size in the overall economy.

3. How Big Is Agriculture?

The direct contributions of the agriculture sector (crops, livestock, forestry, and usually fisheries) to the functioning of the national economy are reflected by its participation in total GDP, its foreign exchange earnings, and its role in supplying savings and labor to other sectors. Such contributions make up the traditional roles of agriculture described in Johnston and Mellor (1961). The development literature in the 1950s is now viewed as generally pessimistic with respect to the sector's potential for productivity and export growth (e.g., Prebisch 1959). There was a presumption that the sector was insensitive to incentives, and there was the perception that significant linkages with other sectors did not exist (Hirschman 1958). This set of stylized facts led to the conclusion that spurring agricultural growth was a low priority in the search for policies that would stimulate national economic development (Lewis 1954).

Of course, we know now that development economists have reassessed the efficiency of agricultural producers and the sector's growth potential, especially following the work of Schultz (1964) and others. The reassessment followed the results of econometric analyses that suggested

that agriculture in developing countries was as responsive as in developed countries, and that the sector was both capable of productivity growth and responsive to technological change. With respect to the links between agriculture and the rest of the national economy, the evidence demonstrated that the farm sector could have significant multiplier effects and therefore that agricultural growth could be propagated to other sectors in the economy (see Adelman and Morris 1973; Mellor 1976; Bell and Hazell 1980; Hazell and Haggblade 1989; Delgado, Hopkins, and Kelly 1998). Due in part to the focus of most of this work on near-subsistence agriculture, the findings concerned primarily the importance of consumption linkages, rather than interindustry effects.

In middle-income countries, such as Latin America and unlike for example South Asia, one would expect to find lower consumption-side multipliers and higher production multipliers—lower consumption multipliers because agriculture has a far smaller share of national GDP; and higher production multipliers because agriculture is demanding a higher share of intermediate inputs from the rest of the economy and represents a more significant supplier of intermediate input to other sectors, such as processed foods. In many studies for poorer countries the consumption-side effects have been large relative to production effects because of the relatively higher share of income generated by agriculture and the isolation of agriculture from other sectors. For example, in Africa consumption linkages have accounted for 75 to 90 percent of the total multiplier; and in Asia, for 50 to 60 percent.²

As countries develop, however, the importance of the consumption linkage falls, leading to the important question of whether the magnitude of the multipliers associated with interindustry linkages between the sector and the national economy is relevant for development strategy. This is of special concern for middle-income countries, where agriculture typically represents a small share of GDP, say between 5 and 15 percent, but where significant levels of poverty remain and where income disparities are high.

The extent of agriculture's interindustry links to other sectors would determine its real size and importance to the overall economy. A recent World Bank report (de Ferranti et al. 2005)³ addressed those linkages for Chile, Colombia, and Mexico, measuring them in terms of domestic agriculture's participation in the demand and supply of intermediate goods and services in backward- and forward-linked sectors.⁴ This approach was based on the same input-output coefficients that serve as the basis of the Hirschman-style multiplier analysis.⁵ Quantifying the size of the agricultural sector, using the same input-output coefficients employed by the multiplier approach, provides a snapshot of the "true size" of the sector and answers the question *How big, really, is agriculture?* (Beyond the accounting question, the next section reviews econometric approaches to detecting the multiplier effects of agriculture on the rest of the economy.)

The approach to this question in the recent World Bank study is to take the agricultural sector's GDP as a base, and add proportions of other sectoral GDPs to estimate an "extended agriculture" GDP.⁶ The proportions of other GDPs are determined by the share of *domestic* agricultural intermediate inputs relative to all intermediate inputs used by individual nonagricultural

² See Sadoulet and de Janvry (1995, 295).

³ The authors of the present paper participated in preparing this World Bank report.

⁴ What is called the agricultural GDP depends on country-specific definitions. For example, in Chile agriculture includes all crops, livestock, forestry, and agricultural services such as farm machinery rentals, farm labor subcontracting, irrigation-well drilling, and other sector-specific services. Estimates of sectoral GDP vary by definition of included activities. They also differ by year and by the input-output matrix upon which yearly estimates are based. For Chile, the 1996 input-output matrix indicates that an agricultural GDP share of approximately 4 percent was constructed during a drought year, particularly bad for farm output. Estimates of the share in 1998 rose to more than 5 percent, but recently have declined to slightly more than 4 percent.

⁵ In the literature there has been interest in calculating multipliers that include household income effects using a SAM approach. The multiplier approach is useful for analyzing the effects of shocks or particular policy changes. Much of the multiplier work was motivated by "choice of strategic sectors"—that is, in which sectors should investment be targeted to yield the greatest impacts either in terms of growth or household incomes or poverty reduction? These impacts would derive from "linkage effects," through both production and consumption, describing how a shock is absorbed throughout the economy. There is no immediate policy implication in terms of a control variable.

⁶ This section draws from the authors' work on chapter 2 of *Beyond the City: The Rural Contribution to Development* (de Ferranti et al. 2005). The calculations are based on the methodology in Anríquez, Foster, and Valdés (2003).

sectors. Estimates of the extended agricultural GDP were computed for three countries: Argentina, Chile, and Colombia. The results are shown in Table 1.

Table 1. Expanded Agricultural GDP Share Estimates for Chile, Colombia, and Mexico

Country	Official Agriculture GDP Share (%)	Expanded Agriculture GDP Share (%)	% Increase in Share due to Forward and Backward Linkages
Chile, 1996 input-output matrix, 2001 GDP	4.92	9.32	89
Colombia, 2000 SAM matrix, 2000 GDP	14.42	18.51	28
Mexico, 1980 input-output matrix, 2002 GDP	5.26	8.00	52

Source: Authors' calculations in de Ferranti et al. (2005), based on methodology in Anríquez, Foster, and Valdés (2003).

Comparing national accounts and adjusted GDP share estimates, one observes that Chile's agricultural sector would expand from an official share of 4.9 percent of national GDP to an integrated share of 9.3 percent, an increase in GDP value of 89 percent. Colombia's agricultural sector, which begins with a much larger official share of GDP, expands proportionally much less, from its official value of 14.4 percent to its integrated share of 18.5 percent, an increase of 28 percent in GDP value. And Mexico's agricultural sector, with a slightly larger official GDP share than Chile's, but much smaller than Colombia's, expands from an official share of 5.3 percent to an integrated share of 8.0 percent, representing an increase in GDP value of 52 percent. Another interesting result of this analysis is that for the three countries, forward linkages dominate. Backward linkages are relatively small, implying that the agricultural sector demands much less in terms of the value of goods and services deriving from other sectors compared with what other sectors demand from it.

These estimates are a snapshot of an expanded agriculture's size and reflect the degree to which the sector is integrated with the rest of the economy. As such, the estimates are related to the Johnston-Mellor view of sectoral links, showing market-mediated input-output interactions between economic activities officially separated in GDP accounting. But the results ought to be interpreted carefully in terms of policy implications, because there are no immediate policy implications in terms of specific recommendations for favoring one sector over another.

There are other approaches to measuring the sector's integration with the rest of the economy. One fairly simple method would be to sum the sectoral GDPs of national activities related to agriculture, forestry, and fisheries to the GDP of input suppliers, processors, and the marketing chain. That is the approach taken by the Inter-American Institute for Cooperation in Agriculture (IICA 2003), and it produces generous estimates of an "expanded agriculture." For Latin American and Caribbean (LAC) countries, IICA's expanded agricultural GDP represents about 30 percent of national output. Furtuoso and Martins (2003) took a more detailed but similar approach to calculating the size of agro-business industries. Their results show that the Brazilian agro-industrial sector accounts for 27 percent of national GDP (out of which primary agriculture occupies 42 percent). In our opinion, simply summing sectoral GDPs would tend to overstate the role of domestic agriculture, because any industry's GDP could be attributable to contributions from various sectors. Certainly other activities could claim the same links as agriculture, and one should account only for domestic agricultural inputs, discounting imported agricultural products.

But whether taking the World Bank estimates or those of IICA and the Brazil study, the implication is that the "real" importance of agriculture is likely larger than its GDP share. With development and increasing intersectoral integration, the economic size of agriculture would be greater than official national accounts. We cannot say that there should be a nonneutral support for agriculture, but we can say that policies favoring or disfavoring agriculture will have impacts in terms of factor costs for downstream industries. Furthermore, there will be effects on nonfarm employment and consequences for wages, labor incomes, and poverty. One is strongly tempted to conclude that

taxing agriculture (discriminating against the sector) would have negative effects beyond the sector itself through the lower growth of related activities. But these sector size estimates by themselves cannot answer this question. An econometric approach to the historical relationship between agricultural and nonagricultural growth is called for to better address policy questions of the distribution of taxpayer funds.

4. Recent Econometric Evidence of the Contribution of Agriculture to Growth

There is an alternative, econometric approach to address the question of the contribution of agricultural growth to national growth and poverty reduction. Econometric treatment of the relationship between agriculture and growth allows for capturing not only the multiplier effects of agriculture on nonagricultural GDP but externalities that would not be revealed by input-output coefficients. Using panel data, one can estimate the total effect of agriculture on growth without directly specifying the mechanisms and interactions between agricultural production and other industries (a reduced form approach). To illustrate, consider the effect of an increase in agricultural GDP, G_A , on national per capita income, y , which is defined as the sum of agricultural GDP and nonagricultural GDP, G_{NA} , divided by population, Pop (considered to grow exogenously):

$$\frac{dy}{dG_A} = \frac{d \frac{(G_A + G_{NA})}{Pop}}{dG_A} = \frac{1}{Pop} \left(1 + \frac{\partial G_{NA}}{\partial G_A} \right).$$

The term $\partial G_{NA} / \partial G_A$ captures multipliers and externalities, an estimate of which would measure the impact at the margin of the additional contribution of agricultural growth to national growth beyond simply its share. In other words, agriculture has a direct impact on growth and an indirect effect through spillovers to the rest of the economy ($\partial G_{NA} / \partial G_A$). We can rewrite the above equation in terms of elasticities and sectoral shares (S_A and $S_{NA} = 1 - S_A$):

$$\frac{d \ln y}{d \ln G_A} = \left(S_A + S_{NA} \cdot \frac{\partial \ln G_{NA}}{\partial \ln G_A} \right).$$

This expression shows that even if the share of agriculture in the national economy (S_A) is low, agriculture's role in per capita income growth could be significant if the externalities and multipliers of agriculture are positive and large (captured by the term $\partial \ln G_{NA} / \partial \ln G_A$, which could be, a priori, positive, zero, or negative). Of course, nonagriculture could also have spillovers on agriculture ($\partial \ln G_A / \partial \ln G_{NA}$).

Then what is peculiar about agriculture? The interesting question is the relative size of these indirect effects—that is, the signs and relative magnitude of these two derivatives. The literature seldom asks this question, tending to be dominated by the multiplier approach. Of course the econometric approach, especially using aggregate data (in contrast to microdata—see Ravallion 2002), cannot separately identify what are multipliers associated with linkage effects that are purely internal at the household and firm level and what are externalities (both pecuniary and nonpecuniary, the latter being necessary for public growth-enhancing interventions). Nor can the analysis of aggregate data distinguish differential geographic externalities, which can be important from a public policy perspective.⁷

Nevertheless, how can one estimate the national-level externalities and multipliers? As Timmer points out, the question of how agriculture contributes to national economic development is an “old and honorable question, dating back to the Physiocrats” (2002, 1489) The most fundamental

⁷ As Ravallion (2002) makes clear in his study of externalities in rural development in China.

and obvious contribution, from a long-term and global perspective, has been the direct contribution of agricultural growth to lower food prices, and therefore higher living standards. Lower real wage cost to the nonfarm sector generates rents that in turn stimulate investments and structural changes (Lewis 1954; Johnson 1957). From the perspective of an individual country open to trade, however, the benefits of lower prices can be accessed by imports.

Without trying to review the entire literature, a useful starting point for the econometric approach is Timmer's (2002) review article on agriculture and economic development. Timmer's analysis of the relationship between the rate of economic growth and the growth of agriculture expands upon the panel data approach to the estimation of endogenous growth models. Using 65 developing countries (1960–1985), he finds that a contemporaneous increase of 1 percent in the growth rate of agriculture would contribute to about a 0.2 percent increase in the nonagricultural growth rate (see Timmer's Table 1, p. 496). But this does not show causality (both sectors could have grown in response to other factors, such as macroeconomic policies); more interestingly for attempting to infer causality, a 1 percent increase in the lagged agricultural growth rate (five years) would contribute to about a 0.14 percent increase in the nonagricultural growth rate.

A recent study by Bravo-Ortega and Lederman (2005), discussed in detail in the recent World Bank study (de Ferranti et al. 2005) mentioned earlier, also examines the links between agricultural growth and the growth of nonagriculture. (It is important to emphasize that agriculture and nonagriculture follow the national accounts definition.) In most countries agriculture includes farm activities, forestry, and fisheries, all at the level of primary production (e.g., excluding off-farm processing). Using panel data of more than 120 countries for the period 1960–2000, nonagricultural GDP was regressed on the one-year lag of agricultural GDP. The approach also controls for lagged nonagricultural GDP level. (Using lagged nonagricultural GDP also is a way to control for the level of development, because one expects faster nonagricultural growth at lower levels of development. This control was not included in Timmer's analysis.) Moreover, a Granger "causality" approach⁸ was taken to resolve the question of what leads what in predictive terms. Does agricultural growth lead nonagricultural growth, or vice versa, or are there reverse effects, each sector to the other?

The results reproduced in Table 2 show that in developing countries historically a 1 percent increase in agricultural growth leads to between a 0.12 percent (for Latin America) and 0.15 percent (other developing countries) increase in nonagricultural growth. (Although statistically different from zero, these regional averages are not statistically different from each other.) This is in contrast to high-income countries, where agricultural growth has been associated with a subsequent decline (–0.09) in nonagricultural growth (perhaps through a resource-pull effect). There appears also a reverse effect: a 1 percent increase in the nonagricultural growth rate leads to a decrease in agricultural growth in non-LAC developing countries. In other countries (LAC and developed) nonagricultural growth appears not to be related one way or the other to subsequent agricultural growth.

These are average regional relationships between one sector's growth and the subsequent growth of the other sector. A look at individual countries shows wide variation. A substantial heterogeneity exists between countries, as illustrated by the case of Latin America. In all LAC countries except Uruguay, agricultural growth is positively related to subsequent nonagricultural growth, and this relationship for 10 of the 20 other LAC countries is considerably above the regional average cross-sector growth elasticity of 0.12, with some countries having very high elasticities of cross-sector growth impacts (e.g., Chile, Jamaica, Guatemala, Argentina, and Brazil).

⁸ The Granger (1969) approach to causality has been adapted to panel data by Arellano (2003).

Table 2. Cross-Sector Growth Elasticities

	LAC Countries	Non-LAC Developing Countries	Developed Countries
Effect of			
1% growth ag. on nonag.	0.12	0.148	-0.09
1% growth nonag. on ag.	0.01	-0.168	-0.03
1% growth ag. + food sector on rest of the economy	0.18	0.054	-0.07
GDP share of			
Agriculture	0.12	0.22	0.03
Nonagriculture	0.88	0.78	0.97

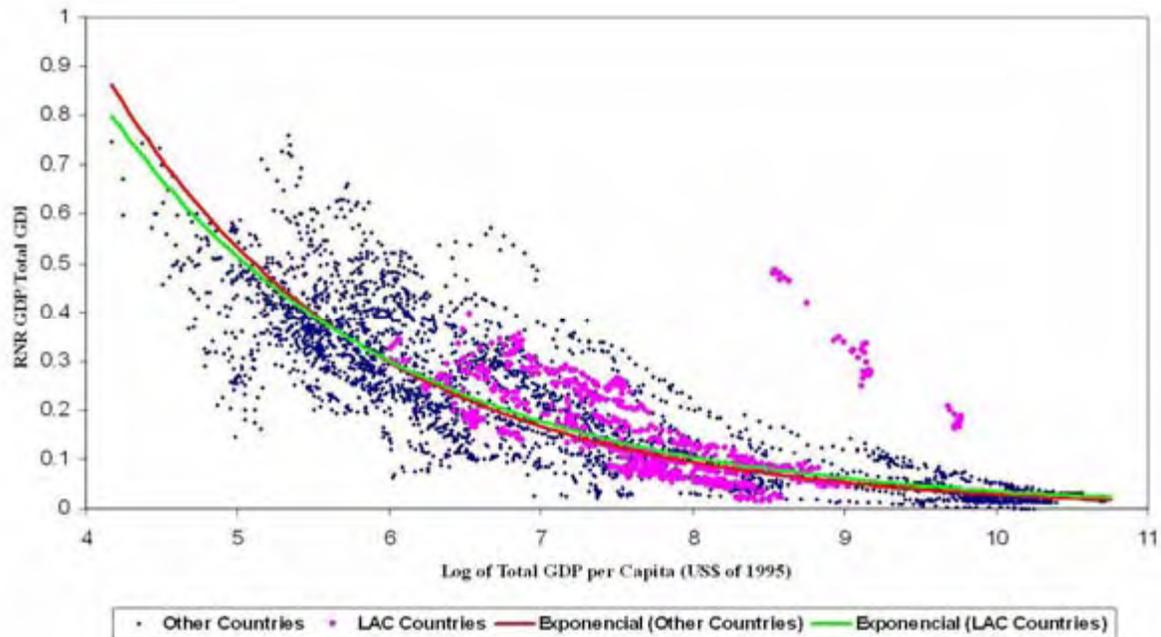
Sources: Bravo-Ortega and Lederman (2005) and figures 3.3 and 3.4 and Table 3.16 in de Ferranti et al. (2005).

It is interesting to note that the econometric evidence is consistent with the linkage results of the previous section: Chile has the strongest linkages (particularly forward) and the strongest cross-sector growth elasticity. Mexico has weaker linkages than Chile but stronger ones than Colombia, and it has a cross-sector growth elasticity double that of the regional average. Colombia has the weak linkages and a cross-sector growth elasticity equal to the regional average.

Furthermore, the Bravo-Ortega and Lederman World Bank study extended the definition of agriculture to include the food-processing sectors. Using the same breakdown of country groups, the results indicate that the LAC average cross-sector growth elasticity from agriculture to nonagriculture increases from 0.12 (excluding food processing) to 0.18 (including processing). In the case of LAC, this strongly suggests that the positive spillovers of agriculture are stronger when the sector's downstream industries are included in the "rural" economy. By contrast, adding the food-processing industries to non-LAC developing countries' agricultural sectors reduces the average cross-sector growth elasticity. This suggests that in non-LAC developing countries, much of the subsequent growth in nonagriculture that is related to current primary agricultural growth is found in processing industries more closely related to agriculture. That is, a substantial part of what is measured as the nonagricultural growth correlated with agriculture is in the food-processing sector. In LAC countries it appears that forward links have a longer reach into industries beyond food processing, probably due to level of development.

If we consider both the direct contribution of agriculture (its share in GDP) plus its indirect contribution to other sectors ($\partial \ln G_{NA} / \partial \ln G_A$), for non-LAC developing countries one finds that agriculture "contributes" about 1.5 times the size of the sector $[(0.22 + 0.78 \times 0.148)/0.22 \approx 0.34/0.22]$ to growth. For LAC countries agriculture contributes about 1.8 times its size $[(0.12 + 0.88 \times 0.12)/0.12 \approx 0.23/0.12]$. In the case of non-LAC countries, nonagriculture contributes slightly less than its share to GDP growth. In LAC and developed countries the nonagricultural contribution is approximately equal to its share in GDP. The results suggest significant spillover effects of agriculture to nonagriculture in developing countries. Along with the lower income elasticity of demand for primary products, the above results imply all the more strongly that agricultural growth would lead over time to a lower share of agriculture in total GDP, which corresponds to historical trends (Figure 1).

Figure 1. Relation between Agricultural GDP Share and Per Capita Income



Source: de Ferranti et al. (2005), Figure 3.2, p. 67.

Initial Policy Implications of Agriculture's Impact on the Rest of the Economy

These results from the recent World Bank study, with a different econometric approach, are comparable to Timmer's estimate of an agriculture spillover effect using the five-year lagged agricultural growth. The story is strengthened: in developing countries agricultural growth contributes to overall growth, which, as was noted earlier, is the most fundamental element of poverty reduction.

What is the policy implication of finding a strong indirect effect of agriculture on nonagriculture relative to the reverse indirect effect of nonagriculture on agriculture? First, it is not an argument for subsidizing agricultural production. After all, the Granger "causality" test suggests but does not really prove causality in a mechanical sense: it shows predictive links. The mechanisms by which agricultural growth would lead to nonagricultural growth would have to be elucidated for practical policy application. The results do, however, reinforce the argument against taxing agriculture relative to other sectors (as in Schiff and Valdés 1992). Moreover, they strongly imply that, in assigning public expenditures to public goods, one should take into account this documented historical relationship between agricultural growth and subsequent nonagricultural growth.

Social project evaluation (unfortunately underrated in most countries) is designed in part to reveal the underlying mechanisms linking public investment projects to a variety of economic activities, and to identify important externalities or spillover beyond some particular sector, such as agriculture. A thorough social project evaluation would incorporate indirect effects on growth, discriminating between high- and low-return projects, but often it is very difficult to capture the intangible externalities involved in individual projects. The econometric approach suggests averages for possible past indirect effects brought about by agricultural growth perhaps stimulated by both high- and low-return public projects. A policy objective would be to promote the high-return projects and reject the low. A simple estimate of the indirect effect would not be enough: it would have to be complemented by social project evaluation—the which, where, and what of public investment. This is particularly important given the recent evidence of an economic misuse of public expenditures on

subsidies in lieu of true public goods, a theme discussed further in section 6 of this paper (see Lopez 2005 and de Ferranti et al. 2005).⁹

5. Recent Econometric Evidence of Agriculture's Contribution to Poverty Reduction

Beyond the contribution of agricultural growth to economic growth, and from economic growth to poverty reduction, there is the question of the role of the sectoral composition of growth—that is, whether sectoral composition influences the strength of the link between overall growth and poverty. Again a useful starting point in addressing this question is the work of Timmer (2002). His econometric analysis of the impact of agriculture on poverty uses 27 countries (1960 to 1992) where agriculture represents at least 5 percent of total GDP. (The average agricultural share of GDP in his data set is 25 percent, and the average share of agricultural workers of the total workforce is 51 percent. His data are therefore very much representative of least-developed countries.) The basic idea is to relate the average income of persons living in each quintile ($j = 1, \dots, 5$) to the sectoral labor productivities ($g_i = G_i/L_i$, where L_i is the labor force in sector i) of agriculture and nonagriculture:]

$$\ln y_j = f(\ln g_A, \ln g_{NA}) \quad j = 1, \dots, 5$$

The estimation of this relationship produces an “elasticity of connection” (Roemer and Gugerty 1997) for each quintile, which represents the marginal impact of a sector's growth on per capita incomes.¹⁰ We are particularly interested in the elasticity of connection for the first quintile, the poorest:

$$\frac{\partial \ln y_1}{\partial \ln g_A} \quad \text{and} \quad \frac{\partial \ln y_1}{\partial \ln g_{NA}}$$

The Bravo-Ortega and Lederman World Bank study (2005) goes further than Timmer and estimates an elasticity of connection that includes both the direct effects of sectoral composition and the indirect effects on poverty through sectoral growth on the growth of the other sector:

$$\begin{aligned} \frac{d \ln y_1}{d \ln g_A} &= \left. \frac{\partial \ln y_1}{\partial \ln g_A} \right|_{\Delta g_{NA}=0} + \frac{\partial \ln y_1}{\partial \ln g_{NA}} \cdot \frac{\partial \ln g_{NA}}{\partial \ln g_A} \\ \frac{d \ln y_1}{d \ln G_{NA}} &= \left. \frac{\partial \ln y_1}{\partial \ln G_{NA}} \right|_{\Delta g_A=0} + \frac{\partial \ln y_1}{\partial \ln G_A} \cdot \frac{\partial \ln g_A}{\partial \ln g_{NA}} \end{aligned}$$

Note that if the sectoral labor force is exogenous (valid in the short and medium term, when migration is less significant), then $\partial \ln g_{NA} / \partial \ln g_A = \partial \ln G_{NA} / \partial \ln G_A$, the estimation of which we have discussed above. It is important to note that this elasticity of connection between growth and incomes is not the same as a growth elasticity of poverty as measured in terms of a change in the poverty level relative to a given poverty threshold (where the location of the poverty line varies across countries). As Heltberg (2004) demonstrates, the headcount ratio of poverty has drawbacks, relying on a proportion of people who cross a poverty line if all incomes increase and ignoring what happens to those who might benefit but remain below the poverty line. In contrast, the elasticity of connection measures the impact of growth on the mean income of the poorest. There will always be a first quintile, but the mean income of this 20 percent is changing.

⁹ At least for Latin America, “the restructuring of public rural expenditures should take precedence over increasing total rural expenditures, although our estimates suggest that, once this is done, national development in the future will benefit from overall rural expenditure increases, as they will be mostly dedicated to the provision of rural public good” (de Ferranti et al. 2005, 22).

¹⁰ Note that for the poverty analysis, one wants the measure of per capita incomes as the dependant variable. By using labor productivities as explanatory variables, one adjusts for differences across countries in the sizes of economies (scale effects).

Timmer finds that for countries where the disparity (or “income gap”) between the richest and poorest is relatively small,¹¹ growth in agricultural labor productivity is “slightly but consistently” more important in generating per capita income in every quintile. For countries where the income gap is large, the elasticities of connection of both sectors for the poorest quintile are small, but rise sharply by income class. This last result leads Timmer to conclude that for high-income-gap countries, the poorest quintile is “nearly left out of the growth process altogether.” Furthermore, in this case agricultural growth is less successful than nonagricultural growth at raising the incomes of the poorest.¹²

For Timmer’s data, between 1965 and 1995, a positive relationship exists between higher national per capita income and a higher income gap. This would imply that historically agriculture has had a declining influence in reducing poverty relative to nonagriculture. He notes, however, an exception: the fastest-growing countries during the decade 1985–1995 showed on average a narrowing of the income gap. He infers that, due to political-economic considerations, the sustainability of the growth of these countries is enhanced by this narrowing of the income gap. On the surface, these results appear disappointing, especially in light of more recent episodes of fast growth in developing countries, such as China and Thailand (which we understand to have shown a growing Gini coefficient). One would hope for higher elasticities of connection of both the agricultural sector and the nonagricultural sector to the incomes of the poorest in the case of large income disparities. But the Timmer results suggest that on average that is not the case.

Cross-section analysis misses some important deviant cases. For example, in the case of Chile, since 1987 the country has had a high and constant Gini coefficient, while the incidence of poverty and the poverty gap were cut by more than half between 1987 and 1994. This success at reducing poverty was due primarily to rapid overall growth; and after 1994 up to 2002, the rate of growth slowed, and the rate of poverty reduction (although still high) slowed as well. Even given the high Gini coefficient, there is a clear long-term trend of declining poverty, which has been highly correlated with the rate of national growth.¹³

The more recent panel data approach of Bravo-Ortega and Lederman takes a similar look at the per capita incomes of quintiles but uses many more countries (84), updated to 2002. In contrast to Timmer, their estimates show that the elasticities of connection (the direct effects on poverty) are higher for nonagricultural than for agricultural growth across quintile groups. For example, for non-LAC developing countries, the elasticities of connection for the poorest quintile are 0.36 for agriculture and 0.64 for nonagriculture (Table 3). In general, in terms of absolute impact, growth in the nonagriculture sector is more important than growth of agriculture, in both LAC and non-LAC developing countries. Moreover, the relative impact of agricultural growth is least for the lowest quintile compared with higher-income quintiles (similar to Timmer’s high inequality scenario). The elasticities of connection for agriculture compared with nonagriculture are even less in the case of Latin America, where the agriculture elasticities fall relative to non-LAC developing countries and the nonagriculture elasticities increase.¹⁴

¹¹ A “high income gap” is when the difference between the per capita incomes of the richest and poorest quintiles exceeds twice the national per capita income. Otherwise, the country has a “low income gap.”

¹² In high-income-gap countries, the elasticities of connection for the poorest quintile are 0.26 for agriculture and 0.45 for nonagriculture, although Timmer does not report the significance level of these estimates; nor does he test whether they are significantly different (see Table 7 in Timmer 2002).

¹³ Poverty rates in Chile are defined in terms of a market basket in constant pesos. The data from which poverty rates and the poverty gap are estimated derive from a biannual national survey of approximately 50,000 households following the same methodology over time. For a discussion of the connection between poverty reduction and growth rates in Chile, see Valdés (1999) and World Bank (2001).

¹⁴ One interesting question that future research might address is the role of asset distribution (particularly land) and a country’s level of development in conditioning the elasticities of connection. As Peter Hazell has asked, would these elasticities be higher with more equitable land distribution? For the direct effect, to the extent that the poverty reduction from agricultural expansions is mainly due to farm employment, the answer would appear to be yes. But on the indirect effects, to the extent that there is a large labor income effect in postharvest activities (classified in the nonfarm sector in national accounts), the answer could be no. It is also important to note that the measure of poverty is household income, not just farm income, and so off-farm employment could be an increasingly more important factor, particularly in middle-income countries. Furthermore, as countries grow richer, one would expect the elasticity of connection to decline.

But, as discussed earlier, agriculture has indirect effects on poverty reduction, through the influence of agricultural growth on nonagricultural growth, which stimulates poverty reduction as well. Table 3 shows both the direct and indirect effects and the total effect of agricultural and nonagricultural growth on poverty. For LAC countries the total elasticity is 0.28 for agriculture and 0.77 for nonagriculture. For other developing countries the corresponding values are 0.48 and 0.58. The first thing to note is that the *indirect effect* of agriculture's growth on poverty reduction is a notable proportion of its total effect both in LAC (a third) and non-LAC developing countries (a fifth). It is also relevant to note that, relative to LAC countries, in non-LAC developing countries agricultural growth has a slightly higher impact on nonagricultural growth, but nonagricultural growth has a smaller impact on poverty reduction. So in non-LAC developing countries the direct effect of agricultural growth is relatively more important for poverty reduction than in LAC countries. Nevertheless, in non-LAC developing countries, growth of the nonagricultural sector is still more important for poverty reduction in absolute terms.

More interestingly, relative to their GDP share agriculture has a greater impact on poverty reduction than does nonagriculture. Agriculture's GDP share averages 0.12 for LAC and 0.22 for non-LAC developing countries. Relative to their shares in GDP, on average, agriculture's contribution to raising the incomes of the poorest is at least 2.5 times that of nonagriculture (2.5 for LAC; 2.9 for non-LAC developing countries).

Table 3. Partial and Total Sectoral Poverty Elasticities

	LAC Countries	Non-LAC Developing Countries	Developed Countries
Partial effect of			
1% growth ag. on average income of poorest quintile	0.191	0.362	0.0 ^a
1% growth nonag. on average income of poorest quintile	0.772	0.642	0.903
Cross-sectoral growth elasticities:			
$\frac{\partial \ln g_{NA}}{\partial \ln g_A}$	0.12	0.148	-0.09
$\frac{\partial \ln g_A}{\partial \ln g_{NA}}$	0.01	-0.168	-0.03
Indirect effect of			
1% growth ag. on average income of poorest quintile	0.093	0.095	-0.081
1% growth nonag. on average income of poorest quintile	0.002	-0.061	0.0
Total effect ^b of			
1% growth ag. on average income of poorest quintile	0.283	0.457	-0.081
1% growth nonag. on average income of poorest quintile	0.774	0.581	0.903

Sources: Bravo-Ortega and Lederman (2005); tables 3.5 and 3.16 in de Ferranti et al. (2005).

^a Not statistically significantly different from zero.

^b For example: $0.191 + 0.772 \times 0.12 = 0.283$.

6. More Policy Implications of Agriculture's Impact on Growth and Poverty

To reiterate, the results of the Timmer and World Bank growth analyses show that for developing countries, the agricultural sector has a positive and fairly strong impact on nonagricultural growth. There is a notable difference between LAC countries and other developing countries with respect to the impact of the nonagriculture sector on agricultural growth. For the LAC countries this cross-sector effect is zero, and for developing countries the effect is negative, with an elasticity of about -0.17.

The cross-sector growth effect of agriculture on nonagriculture increases for LAC when including the processing sector (from 0.12 to 0.18), but decreases for other developing countries (0.15 to 0.05).

With respect to poverty, the same analyses show that for developing countries agricultural growth has a relatively greater impact on poverty than its observed share in the economy as a whole. That is in contrast to a negative impact in rich countries. But the greater a sector's share, the more important would be a growth of 1 percent on increasing the incomes of the poorest countrywide.

What are the implications for government expenditures? For developing countries a 1 percent increase in nonagricultural growth has a stronger impact on both growth and poverty reduction than does a 1 percent increase in agriculture. From both points of view, growth and poverty, if the decision were a choice between a 1 percent growth in nonagriculture versus a 1 percent growth in agriculture, one should select the growth in nonagriculture. But, of course, the policy choice is not a trade-off—that is, gaining a 1 percent increase in growth in one sector by foregoing a 1 percent increase in growth in another sector. One cannot trade off growth rate percentage points one-for-one as if they summed to a budget constraint.

From a public policy point of view, what are the restrictions? One is the government budget; another is the limit to human resources (e.g., technical expertise) and political capital to promote the right policy framework for promoting growth. One should remember that, as is the obvious case with research and development, many of the factors that might enhance agricultural growth grow out of decisions made by experts and policymakers outside of the sector. A country should have the right policy framework in all economic sectors, and one should avoid using these results to excuse ignoring reforms in nonagricultural sectors. Dealing with the human expertise constraint, likely limited in poor countries, we would venture to say that, for instance, five additional experts in nonagricultural sectors (in either macroeconomic policy, education, health, energy, or infrastructure) would have far more impact on overall growth than those five set to work on agriculture. That is, the marginal impact of human expertise in promoting nonagricultural growth directly is very likely significantly larger than in promoting agricultural growth directly. Of course, improvements in “nonagricultural” policy would certainly benefit agriculture. These overall policy environment initiatives have spillover effects between sectors, and they likely do not involve large public expenditures. This is also an area where foreign assistance programs can be productive.

But the question of public expenditures is different. Let's assume that at the margin the government has a windfall of an additional \$10 million to spend. Should it be allocated according to the relative size of the sector in national GDP?¹⁵ Yes, *if* there are no cross-sector growth effects, *and if* additional monies are equally efficient in promoting sectoral growth across sectors, *and if* the only objective is increasing national growth. The answer is no, however, if relative to their sectoral shares agriculture contributes more than nonagriculture to national growth. The estimates above show that agriculture contributes about 1.8 times the contribution of nonagriculture to national growth in LAC countries. For non-LAC developing countries, again relative to their shares, agriculture contributes about 1.6 times the contribution of nonagriculture to national growth. For example, if agriculture's GDP share is 12 percent (the average for LAC), using the estimated cross-sector growth effects and only being interested in promoting economic growth, one would allocate to agriculture on average slightly less than twice its GDP share or about 24 percent of the \$10 million. If agriculture's GDP share is 22 percent (the average for non-LAC developing countries), one would allocate to agriculture 1.8 times its GDP share, or about 40 percent of the additional budget. That is, for nonagriculture the government would allocate considerably less of the windfall than its sectoral share. But we repeat one very important caveat: this is assuming that the expenditures are equally efficient in promoting sectoral growth.

¹⁵ One should recognize the difficulty of moving from a national accounts definition of the agricultural sector to a practical social projection definition of agricultural investments. For example, a project that develops infrastructure, such as roads and electricity, that would directly stimulate the agro-processing sector could have substantial indirect positive effects on agriculture production by creating a market for basic products. Would this project be an agricultural investment or a nonagricultural investment?

If the policy objective combines promoting national growth *and* raising the incomes of the poorest through sectoral and national growth, then even a stronger case exists for allocating additional monies to public goods oriented to agriculture in greater proportion than the sector's GDP share. As mentioned above, although nonagriculture is more important in absolute terms, *relative to their shares in GDP*, on average agriculture's contribution to raising the incomes of the poorest is at least 2.5 times that of nonagriculture in developing countries. But, of course, although very important, mechanisms other than sectoral and national growth exist for addressing poverty. One obvious alternative policy to alleviate poverty (without necessarily having an impact on growth) is to make direct transfers to the poor, using a criterion of the incidence of poverty in rural areas relative to urban areas.

Importance of the Composition of Rural Public Expenditures

In many recommendations for rural development (such as the World Bank's "Reaching the Rural Poor: A Renewed Strategy for Rural Development," 2002), one sees a thorough analysis of the problems and a rich agenda for policy initiatives. The issue of who pays and the financing of strategies, however, is seldom addressed with any degree of satisfaction. That brings us to the question of the effectiveness of expenditures in producing growth—a subject that is extremely important in designing strategies for development and poverty alleviation. So far we have discussed levels of additional expenditure, as if the growth-promoting effectiveness of various projects—between and within sectors—were equal. That is obviously not the case, which as mentioned earlier underscores the importance of social project evaluation.

To illustrate, the recent work of the LAC Food and Agriculture Organization Regional Office in Santiago (Gordillo, Ortega, and Wagner 2004) has led to a rich data set on public expenditures in rural areas,¹⁶ which Lopez (2005) used to examine the importance of the composition of rural public spending relative to simply the level of spending in Latin America.¹⁷ Lopez finds that while public spending levels can promote slightly agricultural GDP per rural person, the mix of spending on public goods and private subsidies¹⁸ is much more important. A reallocation of 10 percentage points of total rural public expenditures (e.g., from 40 percent spending on public goods to 50 percent) raises agricultural GDP per rural person by 2.3 percent—and this without spending a tuppence more in total.¹⁹ A dollar added to total rural expenditures would be shared by both public and private goods. In contrast, an intramarginal shift of a dollar from private to public is claimed entirely by public goods and is lost to private subsidies. There are two effects: (1) more money for public goods, and (2) less encouragement to rent seeking, less overinvestment in subsidized activities, and delays in restructuring away from subsidized investments.

7. Beyond Agricultural Production to the Importance of the Rural Economy as a Whole

To this point we have been addressing the role of agriculture as a sector, vis-à-vis other sectors, in promoting growth and poverty reduction. But in terms of pro-poor growth, what is important is the improvement of the incomes of poor households, both rural and urban. And for poor households within the rural economy, there are both farming and nonfarming households. There is a romantic

¹⁶ See "Base de datos sobre Gasto público en los Campos Latinoamericanos" at www.fao.org/Regional/LAmerica/prior/desrural/gasto/.

¹⁷ The Lopez analysis uses data for Costa Rica, the Dominican Republic, Ecuador, Honduras, Jamaica, Mexico, Panama, Paraguay, and Peru.

¹⁸ We are distinguishing here between public monies spent on completely internalizable transfers (e.g., input and credit subsidies) and public and quasi-public goods (such as research and development and primary education).

¹⁹ As Lopez writes, "In 1996–2000 the 50% of the countries that spent the least in rural areas spent about \$35 per capita while the top 50% of the countries spent about \$74 per capita. Thus if the average bottom spender increased their per capita outlays to levels comparable to the average top, per capita agricultural GDP in that country could increase by more than 3%. With respect to the share of subsidies, in 1996–2000 it ranged from approximately 30% average for the bottom half to 65% for the top half. This means that if an average country in the top half could readjust its public expenditure share to the level of the average country in the bottom half its per capita agricultural GDP may increase, *ceteris paribus*, by a whopping 12.5%!"

view that we can alleviate or eliminate poverty while keeping the number of small farmers constant. What we suggest is to think in a broad perspective about maximizing the contribution of rural public policies to poverty alleviation. This means thinking beyond agriculture to the rural economy, and beyond saving small farms to sustainable employment generation. It does not imply ignoring agriculture or small farmers and forgetting about policies directed at small farmers, but it does imply not obsessing over saving the small farmer forever and everywhere.

In fact, Gardner (2005) concludes that where growth in rural household income has been achieved, five factors have been present.²⁰

- macroeconomic and political stability;
- property rights and incentives;
- productivity-enhancing new technology;
- access to competitive input and product markets; and, importantly,
- real income growth in the nonagricultural economy.

In his controversial and strong conclusion, Gardner emphasizes labor income and the real average income growth in the economy as a whole, because of its effect on labor income. He states,

To remedy rural poverty, what is most needed is improvement in the labor market generally more than, say, improved crop varieties. This is not to say that agricultural research and rural infrastructure investment are not valuable, or that the net effect on poverty is in the right direction. . . . Agricultural economics is the discipline that can analyze the possibilities of these and other profitable investments. . . . Yet it is becoming evident that rural growth and poverty alleviation are not sub-fields of agricultural economics.

The policy point, then, is not exclusively sectoral but national and territorial—how to facilitate the transition from a rural economy based on small farms to a rural economy that is diversified in income sources, competitive in international markets, and dynamic. This might mean migration, public policies to facilitate the nonagricultural rural economy, education, research and development, public infrastructure, and so on. But there is an analytical problem: we know more about how to promote agricultural growth than we do about how to promote nonagricultural rural activities. That is because we know so little about what drives the rural economy and territorial development. As Hewings (2004, discussed in World Bank 2005) notes, there have been many fads in territorial development, but few satisfying economic evaluations.

This leads us first to a basic issue of geography and economics: the location of economic activities—theory and evidence necessary to understand better within-country regional development patterns and regional disparities. Is there a trend toward convergence of returns within and across territories? This is not clear at all as a general rule; and in fact some studies have found otherwise, even in the presence of high national economic growth and overall poverty reduction (e.g., see Soto and Torche 2004, in the case of Chile).²¹ In a world of no distortions, no interventions, and diminishing returns to scale, there should be convergence. But beyond purely geographic causes, convergence might not be observed for a variety of real-world reasons related to household characteristics and to public and private assets. Mobility of labor and persons generally, education, infrastructure, and cultural barriers to mobility are important factors determining the ability of growth in some regions to reduce poverty. But they may be overcome by the provision of public goods, although we know that investments in schooling, health, roads, and other infrastructure are more costly in low-density and remote areas.

²⁰ Gardner's study uses 85 countries, 1960–2001.

²¹ The Chilean case is relevant to the question of within-country regional convergence, because it is an example of a country whose conditions seemed most apt to drive convergence. Chile has a fairly homogenous population, with no barriers to human and capital flows; it is a unitary state. More to the point, its annual per capita GDP growth averaged 5 percent between 1975 and 2000 and poverty declined significantly in all regions, but regional income inequality remained stagnant.

But *What is the role of agriculture in pro-poor growth?* is the theme of this session. We emphasize that this is not the same as the role of small farms and small farmers in pro-poor growth. In fact, aside from collective farm systems (China and the Soviet Union in the past), with growth we are almost certain to see a decline in the importance of small farms in agricultural production and their contribution to the larger economy. Not only will the share of total output that originates on small farms decline, but the relative importance of the income generated on small farms will decline as well, both for small farm family incomes and for rural incomes more broadly.

The evidence suggests that wages, self-employment outside agriculture, and other earnings from commercial activities, manufacturing, and other services are significant sources of income for rural households. Rural nonfarm income tends to be positively correlated with national development, and case studies indicate positive growth over time of nonfarm income as a share of total household income in rural areas. As a proportion of total employment in rural areas, nonfarm *employment* averages approximately 25 percent in Latin America and 44 percent in Asia, usually representing a lower share than nonfarm *income* relative to total income.

Consider the case of Latin America, where we have a relatively good overview of nonfarm economic activities. The rate of nonfarm employment in rural areas has been growing in Latin America (except in Peru and Bolivia). In absolute terms, rural nonfarm employment has grown in all countries of the region, and grown significantly more rapidly than farm employment, which in many cases has declined in absolute terms. As a regional average, the percentage of the rural population having a rural nonfarm activity as the principal economic activity increased from 24 to 29 percent over the decade of the 1990s. From survey analysis of rural households for the late 1990s, nonfarm income represents more than 40 percent of total household income in nine of 12 countries, and more than 50 percent in six countries (see Reardon, Berdegúe, and Escobar 2001). Furthermore, this share has been increasing for most countries. While there has been a reduction in farm-based employment, nonfarm employment has been increasing, with a net increase in the level of total rural employment.

In an analysis of the 2003 Mexico National Rural Household Survey, Taylor, Yúnez-Naude, and Cerón (2004) find that the key to economic livelihood in rural Mexico is the management of diverse household assets. Various forms of income-generating assets are heterogeneously distributed with different households having different asset portfolios. This leads to a more equitable income distribution across rural households than would otherwise be expected from simply looking at individual asset distributions. More important, the main assets for Mexico's rural households are increasingly human and migration capital, both having the effect of reorienting households away from agricultural production and toward the nonfarm economy. In fact, the Taylor, Yúnez-Naude, and Cerón empirical evidence suggests that total rural household income is much more sensitive to human capital and migration than to land or other agricultural assets. That is apparently due to the reduction of off-farm income associated with higher stocks of agricultural assets, while more human capital generates greater off-farm income and has a much smaller effect on shifting resources from the generation of on-farm incomes.

The pattern of nonagricultural income sources seen in Mexico is confirmed by a recent study of the microdeterminants of sectoral participation and income growth of farm families in El Salvador. Tannuri-Pianto et al. (2004) examine a panel data set of rural households for the period 1995–2001 and find strong evidence of the significant contribution of off-farm employment to rural income growth. While income from agricultural sources grew only 1.2 percent annually (primarily due to the poor performance of the coffee sector between 1995 and 2001), income from nonagricultural sources increased at a rate of 18.5 percent and remittances and transfers from relatives at a rate of 42.9 percent. The distribution of time dedicated to household labor activities shifted from 60 percent of labor hours dedicated to farming to 44 percent. The relative importance of agriculture in a typical household's total income went from 44.0 percent in 1995 to 26.4 percent in 2001, and the relative importance of nonagricultural sources grew significantly from 46.8 percent in 1995 to 55.2 percent in 2001. That was due mainly to the rapid growth of income from entrepreneurial activities (microenterprises) and transfers, especially remittances from relatives abroad, which increased in importance from 8.1 percent to 16.3 percent by 2001.

The evidence is not only for Latin America. Foster and Rosenzweig (2004) have underlined the importance for the generation of rural income of labor-intensive small-scale manufactures in India. And a recent *Financial Times* article reports the results of a recent analysis for India by CERG Advisory in Dehli: “More than a third of rural households in India derive their income from services or manufacturing—not from farming. . . . In the most successful farming states of Punjab, Kerala and Haryana over half of all rural households have escaped agriculture altogether. . . . The findings, which were produced by a detailed analysis of India’s last two censuses and national consumer expenditure surveys, undermine the widespread view among policy makers that a stronger agricultural sector can in future employ the bulk of India’s 430m-strong workforce” Ellis and Freeman (2002) compare and contrast rural livelihoods in Uganda, Kenya, Tanzania, and Malawi and conclude, “Better off households are distinguished by virtuous spirals of accumulation typically involving diverse livestock ownership, engagement in non-farm self-employment, and diversity of on-farm and non-farm income sources. Lessons for . . . the creation of a facilitating rather than blocking public sector environment for the multiplication of non-farm enterprises; seeking creative solutions to the spread of technical advice to farmers; and examining critically the necessity for, and impact of, tax revenue collection by district councils on rural incomes and enterprise.”

The shift from traditional agriculture to off-farm productive activities has been driven by both public policies, such as the provision of rural roads and better access to rural education, and households’ own diversification strategies, such as a shift toward nonfarm employment and migration abroad. The Tannuri-Pianto et al. study, for example, finds that electricity and proximity to markets (e.g., through better roads) increases the probability of relying primarily on off-farm occupations. Families that lack access to such infrastructure, and typically have much less access to informal credit, tend to remain in agriculture. Tannuri-Pianto et al. also find significant evidence pointing to important complementarities between rural investments and to the potential for families to benefit from such investments, which depends on households’ productive endowments, including education. This is certainly consistent with the general conclusion derived by Lanjouw (2000, 2003) from his detailed analyses of Brazil, Ecuador, and El Salvador. There is significant evidence of greater nonagricultural activity in those areas better served by rural infrastructure and for households with better levels of education.²² The coordination of rural investments—in education, roads giving access to markets, and the provision of credit—would ensure that returns on many of these investments are realized and that the conditions of the poor are improved.

Endogeneity of Agricultural Productivity and the Evolution of the Structure of Farming

We wish also to emphasize that there is a degree of endogeneity to agricultural productivity. Usually we think in terms of new plant varieties or irrigation as productivity enhancers. Such sources of productivity gains usually do not have much connection to what is going on in the rest of the economy and often can be used by relatively small farmers. They are like donations, better to have than not have, but they depend less on a dynamic nonfarm economy. But agricultural productivity is also driven in some subsectors by dynamic developments in the nonfarm sector—for example, an increasing demand for higher-value-added products (especially in the context of the supermarket revolution) and the reduction of marketing and transaction costs from improved financial, transport, and telecommunications markets. Often these types of productivity drivers found in the rest of the economy have implications for scale in farming, requiring investments and fixed costs that influence the “structure of farming”—the distribution of farm sizes and returns. The rest of the economy is changing, producing a flow of new opportunities for farmers. A major issue for this conference is to what extent small farmers can participate both as producers and as workers in taking advantage of this flow of opportunities. What can be done to encourage their participation?

²² Lanjouw also notes, “Clearly a minimum prerequisite and one that in the past has often been lacking in rural parts of Latin America is a measure of safety and personal security” (2000, 118).

8. Final Comments: The Point Is to Eliminate Poverty

With respect to small farmers in the developing world, we have to deal with what we have. But is there anything inherently pro-poor about maintaining the existence of a large number of small farms? No, the point is not to maintain millions of small farmers, but to eliminate poverty. The best of all possible worlds perhaps is one where a dynamic overall economy is spurred by agricultural growth and in turn spurs the growth of agriculture and the structure of farming, and at the same time offers better nonfarm income opportunities to families of formerly small farmers. Beyond having a stagnant economy, perhaps the most discouraging case is where a dynamic economy, both domestic and global, drives changes in the structure of agricultural production but does not provide opportunities to the poor, who then remain as small farmers without being able to take advantage of nonfarm employment opportunities (for geographic, demographic, and cultural reasons and because of labor market restrictions). This leads to a discussion of safety nets.

Certainly greater research and development, better infrastructure and rural finance, and other policy initiatives in poorer regions will improve agricultural productivity and the rural economy generally. But some households in some regions will lag behind in rural and national growth because they do not have the assets that complement the positive developments elsewhere. Age, illiteracy, poor soils and climate, low population densities all will conspire against finding productive employment opportunities, whether on or off the farm. How should policies be designed to aid such households and communities? Recently many governments have made use of programs to provide income support and cash transfers, often as a compensatory response to trade liberalization. Such programs, however, are more broadly applicable to lagging regions and families. Their focus is income-based rather than farm-related support. There are three common features of the conditional cash transfer payments: targeted to rural areas and to poor households, based on number of children in the household, and program continuation contingent on the final impact on human capital. Perhaps the most important point of these types of programs is to support the long-term human capital investments in children. An important ingredient in the success of such programs is the simultaneous government investment in social infrastructure to ensure better health and schooling services. It is noteworthy that the objective of these child-contingent programs is not to keep people on the farm or even in rural areas but to promote the opportunities and mobility of future generations, both in economic and geographic terms. For the immobile, such as the elderly, other safety net aspects are being adopted in several developing countries.

Middle-income countries have at least the potential to finance such schemes, and many countries do. To what extent can least-developed countries finance and implement such safety nets? This returns us to the theme of rapid growth and agriculture's role in securing that growth. Rapid growth allows at least the potential for a rapid growth of fiscal revenues. This connects us again to the importance of the composition of government spending. Foreign assistance can help, but it cannot in a sustained manner replace domestic resources wisely spent.

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The Role of Agriculture and Small Farms in Economic Development*

Peter Hazell, Senior Institute Fellow, International Food Policy Research Institute (IFPRI), USA
Xinshen Diao, Senior Research Fellow, Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), USA

1. Why Agriculture Is Important—the “Conventional” Wisdom

Before the Green Revolution, agriculture was widely seen as a stagnant, low-productivity, and residual sector that could be plundered of its labor and capital for use in industry.¹ But that view was swept aside in the late 1960s by the dynamism of the Green Revolution. Agriculture came to be seen as a growth sector that could

- generate more food and raw materials at lower prices;
- free up foreign exchange for the importation of strategic industrial and capital goods;
- provide growing amounts of capital and labor for industrial development;
- with rising rural incomes, provide a growing domestic market for nascent national industries; and
- reduce poverty by increasing labor productivity and employment in rural areas, by generating more remunerative opportunities for rural-urban migration, and by lowering food prices for all.

These developments opened up whole new possibilities for agriculture-led development strategies in low-income countries.²

What did we learn from the subsequent experiences?

- That agricultural growth has powerful leverage effects on the rest of the economy, especially in the early stages of the economic transformation when it accounts for large shares of national income, employment, and foreign trade;³ and
- That it can generate patterns of development that are employment intensive (hence favorable for the poor)⁴ and favorably distributed between rural and urban areas. This contrasts sharply with most industrial-led growth strategies.

We also learnt much about the conditions under which agriculture-led growth is most likely to succeed.⁵ There are five key conditions. First, *agricultural growth needs to be technologically driven* so that output prices can fall while farm incomes increase. It is not enough to simply use more farm inputs like fertilizer and irrigation water and investments in productivity-enhancing agricultural research and development that reduces unit costs of production and sustains yield growth over time are also critical for success.

* The authors have drawn liberally on an IFPRI paper prepared by Diao et al. (2005b). The present paper was revised August 9, 2005.

¹ See, for example, Lewis (1954).

² See, for example, Johnston and Mellor (1961) and Mellor (1976).

³ See Mellor (1976) and Haggblade, Hammer, and Hazell (1991).

⁴ There is a large econometric literature that uses cross-country or time series data to estimate growth-poverty elasticities by sector. These studies generally find high poverty reduction elasticities for agricultural productivity growth, especially in the early stages of development and relative to other sectors. For example, Thirtle, Lin, and Piesse (2002) in a cross-country study estimate that a 1 percent increase in crop productivity reduces the number of poor people by 0.72 percent in Africa and by 0.48 percent in Asia. In India, Ravallion and Datt (1996) have estimated the elasticity of poverty reduction with respect to agricultural value added per hectare at 0.4 percent in the short run and 1.9 percent in the long run, the latter through the indirect effects of lower food prices and higher wages.

⁵ See Rosegrant and Hazell (2000) for a discussion of the lessons from Asia.

Second, *farmers need favorable incentives* if they are to invest and produce efficiently. Policies that distort the terms of trade against farmers hold back the entire economy, not just agriculture. Third, *agricultural growth needs to be broad based (or equitable)* so that it is economically efficient and puts increased purchasing power into the hands of the rural masses, and not just a privileged few. This conclusion followed from work showing that small and medium-sized farms are typically more efficient producers than large farms in low-income countries⁶ and have better consumption and investment patterns for stimulating growth in the nonfarm economy.⁷ Broad-based agricultural development in turn requires equitable access to land, modern farm inputs, credit, and markets.

Fourth, *adequate levels of public investment in rural infrastructure* are essential for promoting growth of the nonfarm economy and rural towns as well as agriculture, and for strengthening rural-urban demand linkages. Work at the International Food Policy Research Institute (IFPRI) shows that such investments still give high returns and help reduce rural poverty, even in countries such as India and China that have already invested heavily in their rural areas.⁸

These four conditions are required to achieve an agricultural revolution with the right kinds of growth linkages to the rest of the economy. But if the agricultural revolution is to translate into rapid and sustained national economic growth, a fifth condition must be met: *Markets and trade must gradually be liberalized*. As agriculture develops and food security diminishes as a major constraint, countries need to move quickly toward market liberalization and pro-trade policies. This is necessary to create new market opportunities for agriculture and industry and to prevent the chronic over production of food staples.

As the economic transformation of an economy advances, agriculture's share in national income falls quite rapidly and its importance for national economic growth diminishes. The economic problem is then to absorb workers out of agriculture at a sufficiently rapid rate to stop their average productivity (and hence their incomes) from lagging behind the levels achieved in the nonagricultural sector. Improvements in labor productivity in agriculture require investments in agricultural mechanization, larger farm sizes, and diversification into higher-value products, with a concomitant increase in the migration of workers to other sectors, either through rural-urban migration or economic diversification within rural areas. Countries that fail to manage this transformation at an adequate rate typically end up adopting costly farm income support policies.

2. The African Challenge

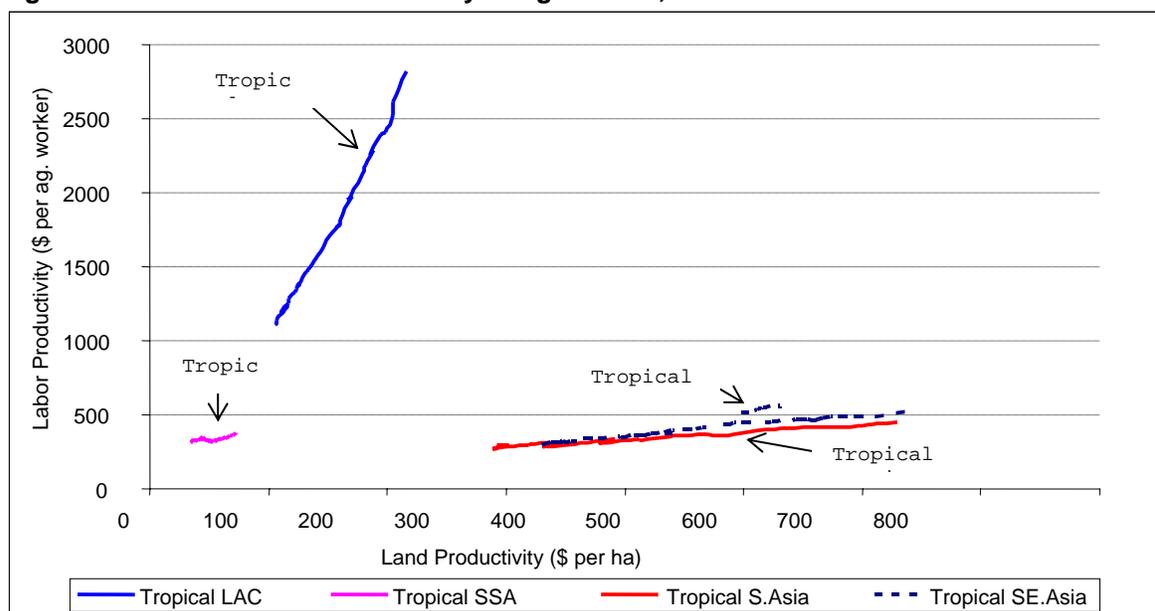
Although agriculture-led growth played an important role in the economic transformation of much of Asia and Latin America and helped slash poverty in those regions, the strategy has not yet worked in Africa. Most African countries have not met the requirements for a successful agricultural revolution, and factor productivity in African agriculture seriously lags behind the rest of the world (Figure 1). As a result, many African countries still face severe national food constraints, remain heavily dependent on traditional agricultural export markets (with declining and volatile prices) for most of their foreign exchange earnings, and have such small domestic markets for nonagricultural goods and services that their industries remain at an early and inefficient stage and are not yet ready to compete in liberalized markets. Poverty and food insecurity remain and continue to worsen.

⁶ See Heltberg (1998) for a recent review.

⁷ See, for example, Hazell and Roell (1983) and Mellor (1976).

⁸ Fan, Hazell, and Thorat (2000); Fan, Zhang, and Zhang (2000).

Figure 1. Labor and Land Productivity in Agriculture, 1961–1997



Note: Measured in 1989-91 international dollars

Source: Calculated by authors from FAO data.

The lessons from Asia and elsewhere seem clear. Africa needs a concerted effort to accelerate smallholder-led agricultural development, including increased and sustained investments in agricultural research, institutional and human capital, and rural infrastructure; and more effective service provision for farmers, including modern inputs, credit, and marketing services to launch an agricultural revolution on the scale required to accelerate economic growth and slash poverty. Only then can the transition to industrialization can be expected to succeed.

Much of Africa is blessed with abundant natural resources on a per capita basis, and yields are so low that plenty of opportunities exist to raise them through technological change. Yet revitalizing the sector will not be easy: Africa still has much lower densities of rural infrastructure than India had even in the 1950s (Spencer 1994); Africa has weak institutions for rural development; there is limited irrigation potential and most agriculture must be conducted on depleted soils and under difficult climatic conditions; and world agricultural prices are at historic lows.

These problems are neither new nor insurmountable. Despite the many failures of the past, there is plenty of evidence to show that success is possible. For example, despite widespread pessimism about the past performance of the agricultural sector in Africa, on a continent-wide basis the sector has actually grown at a respectable 2.5 percent per annum since 1980, compared with 1.2 percent for industry and 2.5 percent for services (World Development Report, 2002). The real problem is that Africa's agricultural performance has been insufficient in relation to high population growth, leading to a decline in per capita production. Recent work by IFPRI also highlights a number of very successful examples of African agricultural development and the factors that helped make them so (Haggblade 2004). African countries are also asserting their own more optimistic vision as exemplified in the Comprehensive Africa Agriculture Development Programme of the New Partnership for Africa's Development.

Perhaps one of the bigger challenges facing Africa today is overcoming growing skepticism in the international development community about agriculture's relevance to growth and poverty reduction in the modern world. Despite the successes achieved in Asia and elsewhere, the development community seems to have tired of agriculture and is now trying to impose a post-agricultural revolution strategy on Africa before its own agricultural revolution has happened. High

hopes are being placed on market liberalization, privatization, agricultural diversification, and good governance, while at the same time public spending on the basic investments needed for agricultural and rural economic development has stagnated or declined (Fan, Zhang, and Rao 2004).

3. Contemporary Skepticism about African Agriculture — The “New” Wisdom

As the impacts of globalization and trade liberalization are felt around the world and as many countries have grown out of low-income status, there is a growing sense that the role of agriculture must also change and that this has important implications for agricultural development strategy, even in Africa. Here are some of the key positions promoted by a new breed of agricultural “skeptics”.

- With cheap and plentiful food imports available, African countries can leapfrog the need for agricultural development and proceed directly to industrialization.
- Increases in rural-urban integration, migration, and rural income diversification have made agriculture largely irrelevant for the rural poor.
- Most small farms are not viable in today’s markets and hence should not be prioritized in future agricultural investment strategies.
- With low world cereal prices, agricultural development should now focus on high-value commodities and value-added processing rather than food staples production.
- The public sector has a relatively minor role to play in Africa’s agricultural development, while the private sector should be in the driving seat.

We consider each of these arguments in turn.

With Cheap and Plentiful Food Imports Available, African Countries Can Leapfrog the Need for Agricultural Development and Proceed Directly to Industrialization

In many respects this argument harks back to the immediate post-independence industrialization policies of many low-income countries. Then, priority was given to subsidized and protected industries while agriculture was penalized and plundered for its resources through unfavorable macroeconomic, trade, tax, and pricing policies. Those policies failed in part because the industries that were fostered proved to be highly inefficient, but also because growing food gaps induced foreign exchange constraints and higher food prices, which themselves dampened the industrialization process. The argument is new today in the sense that globalization and trade liberalization provide more export opportunities and make industrial protection more difficult, and because food is even cheaper on the international market. But serious difficulties remain.

First, most African countries begin with a small and inefficient industrial base whose growth performance is still less than stellar. Turning this performance around in an open-trade environment is a daunting task. Not only are fledgling industries expected to compete with the world’s best in export markets, but trade liberalization is a two-edged sword that also opens up domestic markets to imports that can decimate whole swaths of local industry before they have the chance to adjust and compete. The approach contrasts sharply with the proven and successful approach of many East Asian countries that first nurtured their industries through growth in protected domestic markets and subsidized exports before exposing them to the full force of international competition.

Second, there is a scaling-up problem. Industry currently employs about 10 to 15 percent of the labor force in Africa, and its employment elasticity remains low compared with agriculture. Even if the performance of the industrial sector were to improve dramatically and it grew at the kind of rates observed in many of Asia’s Tiger economies during their golden years, it would still take decades

before a large enough share of the labor force could be pulled out of agriculture to seriously reduce poverty.⁹

Third, despite low world food prices, food costs remain high for many Africans because of high transport costs within the continent. Growing food where it is needed is still the least costly option for many Africans. Moreover, while fixed exchange rates are largely a thing of the past, growing food imports can still lead to currency depreciation in foreign exchange markets and higher food costs in local currencies. This in turn raises real wages and dampens industrialization.

Increases in Rural-Urban Integration, Migration, and Rural Income Diversification Have Made Agriculture Largely Irrelevant for the Rural Poor

The “rethinking rural development” school (represented by Maxwell, Urey, and Ashley 2001 and Ellis and Harris 2004) argues that rural areas are highly heterogeneous and are changing in the size, structure, and capability of their populations; in the patterns of their economic activity; and in the degree of their integration with national and international economies. In many regions agriculture has become a relatively small production sector, which will increasingly be commercially incorporated into national and international commodity chains. Most rural households already have diverse and geographically dispersed portfolios of income sources. As a result of these changes, the rethinking rural development school questions whether agriculture should any longer be viewed as the primary engine of rural growth. Its argument is reinforced by (a) the long-term global decline in agricultural commodity prices that has undermined the profitability of agriculture as a business; (b) the fact that the policy instruments to support the Green Revolution in Asian countries, such as price supports, fertilizer and credit subsidies, and public irrigation schemes, are not now available within currently accepted models of public sector intervention; and (c) the pressure on the natural resource base for agriculture that is leading to worsening degradation and even declining productivity. The rethinking rural development school emphasizes migration and rural nonfarm activities and believes diversification options for multi-occupation and multilocation households can become the relevant engine of growth for rural areas.

Income diversification is actually not new at all and has long been observed as a strategy by which rural households cope with risk and enhance their incomes (e.g., Collier and Gunning 1999; Reardon et al. 1994). One of the first large-scale rural household surveys in Africa found that smallholders derived half or more of their incomes from nonfarm sources (Kenya 1977, 54). If most African farmers have not been able to find pathways out of poverty despite income diversification strategies over many decades, then it is not clear why that strategy should suddenly work much better today, particularly in countries where the nonagricultural sectors are not actually thriving either! Even in many Asian countries, farmers were highly diversified before the Green Revolution (e.g., evidence from India in Ravallion and Datt 1996), yet it took dramatic changes in agricultural technology and productivity to make any significant inroads into poverty levels.

History shows that countries invariably diversify as they develop, and that involves a decline of agriculture relative to the rest of the economy and the movement of workers out of agriculture and into other occupations. But diversification is demand driven and follows rising per capita incomes; it is not a primary engine of growth in its own right as the rethinking rural development school seems to believe.

⁹ Assume, for simplicity, a two-sector economy with agriculture (A) and nonagriculture (N). The annual growth in employment (dE/E) is then a function of the annual growth rates in output of agriculture (dA/A) and nonagriculture (dN/N), the initial employment shares of the two sectors (s_A, s_N), and their employment elasticities with respect to output (e_A, e_N). Specifically, $dE/E = s_A e_A dA/A + s_N e_N dN/N$. In a typical low-income African country, agriculture's employment share is about 70 percent. Assuming employment elasticities of 0.5 for agriculture and 0.3 for nonagriculture, and an agricultural growth rate of 2.5 percent, then nonagriculture output would have to grow by 24 percent per year in order to achieve 3 percent growth in total employment, and even that would only just keep up with growth in the labor force. On the other hand, if agricultural growth increases to 6 percent, then nonagriculture only needs to grow at 10 percent. But nonagriculture would need to grow much faster indeed to achieve a significant reduction in agriculture's labor share within a decade or two, and this assumes that the growth burden for nonagriculture is shared between industry and services and does not fall on industry alone.

The major engines of economic growth in low-income countries are tradables—agriculture, tradable services (like tourism and IT), manufacturing, and overseas migration (remittances)—which can be sold, usually abroad, into deep markets. These contrast with nontradables, such as services that cater largely to national markets whose size and capacity to grow depend critically on local income levels, which in turn depend on tradables output. When one or more tradable engines of growth are doing their job, the income increases they generate lead to rapid growth in demand for local nontradables, with important spillover opportunities for rural income diversification (see, for example, Haggblade, Hammer, and Hazell 1991). In this context, rural-urban migration and rural income diversification are indicators of economic growth and structural transformation and a sign that workers are typically being “pulled” out of agriculture into higher-paying occupations. But when the major engines of growth are stalled, as in much of Africa, migration and income diversification are more typically distress phenomena, with workers seeking to augment already low and declining per capita incomes by increasing production of low-productivity nontradables for sale into saturated local markets. In this case, migration is a “push” phenomenon that “depresses wage-rates; denudes rural areas of innovators; and hence, while it may briefly relieve extreme need, seldom cuts chronic poverty” (Lipton 2004, p. 16). National economic context is therefore very important in thinking about how to grow rural livelihoods.

Historically, agriculture has played the role of primary engine of growth in the early stages of development. As Lipton argues, “Europe in 1740–1900 and Asia since 1960 show that when urban industrialization offers major prospects for employment (and poverty reduction), it is fairly late in an already successful, agriculture-led development process” (2004, p. 7). Key questions are whether this must also be true for Africa today, and, if not, which sectors can replace agriculture in its primary growth role in the early stages of Africa’s economic development?

Agriculture accounts for about 30 percent of gross domestic product (GDP) for Africa as a whole, and even larger shares in more than two-thirds of Africa’s low-income countries. In contrast, the industrial sector, which is the only realistic alternative source of tradables output on the scale required for most African countries, consistently accounts for the smallest share of GDP in almost all low-income countries; exceptions include a few mineral-resources-rich countries. Services usually account for more than 50 percent of GDP in many African countries, but most of those are either nontradable or are part of the government sector.

As the dominant production sector, agriculture not only remains important for national economic growth but also for poverty reduction. Simulation results conducted at IFPRI with economywide models for Ghana, Ethiopia, and Rwanda show that given similar growth rates in total GDP, poverty falls faster when growth is led by agriculture rather than industry (Table 1). The growth–poverty reduction elasticities are much higher in the agriculture-led growth scenarios. This result holds for all three countries despite differences in their agricultural opportunities and farm sizes.

Table 1. Growth-Poverty Reduction Elasticity for Selected Countries

Country	Base Scenario	With Additional Growth from Agriculture	With Additional Growth from Nonagriculture
<i>Ghana</i>			
Annual growth rate per capita			
GDP	2.16%	3.07%	3.07%
AgGDP	2.07	4.41	2.07
NonagGDP	2.21	2.24	3.58
Growth-poverty elasticity		-1.83	-1.28
<i>Ethiopia</i>			
Annual growth rate per capita			
GDP	0.53	2.39	2.39
AgGDP	-0.05	2.41	0.17
NonagGDP	1.12	2.35	4.33
Growth-poverty elasticity		-1.66	-0.73
<i>Rwanda</i>			
Annual growth rate per capita			
GDP	0.66	3.22	3.22
AgGDP	0.59	4.92	0.81
NonagGDP	0.74	0.84	5.37
Growth-poverty elasticity		-1.06	-0.62

Sources: Author simulation model results.

As African countries develop and diversify, other sectors will become important sources of tradables output and agriculture's role as the primary engine of growth will diminish. But other sectors are not yet ready to play that role on the scale required, and, at least in the case of industry, that would lead to inferior patterns of growth in terms of poverty reduction.

Most Small Farms Are Not Viable in Today's Markets and Hence Should Not Be Prioritized in Future Agricultural Investment Strategies

Agricultural marketing chains are changing dramatically in all types of countries. The small farmer is increasingly being asked to compete in markets that are much more demanding in terms of quality and food safety, more concentrated and integrated, and much more open to international competition. Supermarkets, for example, are playing an increasingly dominant role in controlling access to retail markets (Reardon et al. 2003), and direct links to exporters are often essential for accessing high-value export markets. As small farms struggle to diversify into higher-value products, they must increasingly meet the requirements of such demanding markets, both at home and overseas. These changes offer new opportunities to small farmers who can successfully access and compete in the transformed markets, but they are also a serious threat to those who cannot.

At the same time as markets have become more unforgiving, structural adjustment and privatization programs have left many small farmers without adequate access to key inputs and services, including farm credit. State agencies no longer provide many direct marketing and service functions to small farms, leaving a vacuum that the private sector has yet to fill in many countries (Kherallah et al. 2002). The removal of subsidies has also made some key inputs, such as fertilizer, prohibitively expensive for many small farmers, and the removal of price stabilization programs has exposed some farmers to greater downside price risks. These problems are especially difficult for small farms living in more remote regions with poor infrastructure and market access.

Within this context, there is a growing view that most smallholders do not have a viable future in farming, and that agricultural development should now focus on larger and commercially oriented farms that can successfully link to the new types of market chains.

Yet small farms offer important economic and social advantages in low-income countries:

- They are more efficient producers in labor-surplus economies (because family workers are less costly and more motivated than hired workers and small farms are more likely to use labor rather than capital-intensive technologies).
- They help contain poverty by providing an affordable home platform from which poor households can experiment with ways to improve their livelihoods.
- They help prevent premature urban migration and the explosive growth of large cities.
- They also ensure a degree of food security in rural areas where high transport and marketing costs can drive up food prices, while at the national level their higher land productivity has the potential to help poor countries attain greater self-sufficiency in staples such as cereals, tubers, and even livestock.

Many such advantages slowly disappear as countries develop and labor becomes scarcer relative to land and capital, leading to a natural transition toward larger farms and an exodus of small farm workers to towns and nonfarm jobs. But that transition does not normally begin until countries have grown out of low-income status, and it typically takes several generations to unfold. A common misdiagnosis stems from overlooking this broader economic context for determining the economics of farm size.

For most low-income countries, the problem is not that small farms are inherently unviable in today's marketplace, but that they face an increasingly tilted playing field that, if left unchecked, could lead to their premature demise. Key requirements for ensuring their survival will be improving infrastructure and education, ensuring that small farms get the technologies and key inputs they need, and promoting producer marketing organizations that can link small farmers to the new market chains. Small farmers cannot do all these things on their own, and the public, private, and nongovernmental organization sectors all have important roles to play. The social and economic benefits from these kinds of interventions can be enormous.

With Low World Cereal Prices, Agricultural Development Should Now Focus on High-Value Commodities and Value-Added Processing Rather Than Food Staples Production

With chronic global surpluses of major food staples and rapid expansion in international agricultural trade, many see the best opportunities for developing-country farmers in high-value commodities such as fruits, flowers, vegetables, and livestock. In many successfully transforming countries, domestic demand for such products is growing rapidly, providing ready market outlets for increased domestic production.¹⁰ In many low-income countries domestic demand is much weaker, and the best opportunities are seen in export markets. Many African countries, for example, are being encouraged to expand into high-value, nontraditional exports, as well as to improve the quality of their traditional tree crop exports.

In reality, the market opportunities for African agriculture are more nuanced (Diao and Hazell 2004). While opportunities exist for improving traditional exports through better-quality and niche markets and while nontraditional exports are growing quite fast, albeit from a small base, the greatest market potential for most African farmers still lies in domestic and regional markets for food staples (cereals, roots and tubers, and traditional livestock products). For Africa as a whole, the consumption of these foods accounts for about 70 percent of agricultural output (Table 2) and is projected to double by 2020. This will add another \$50 billion per year to demand in 1996–2000 prices. Moreover, with increasing commercialization and urbanization, much of that additional demand will translate into market transactions and not just additional on-farm consumption. There are no other agricultural

¹⁰ In India, for example, high-value products now account for just over half of the total value of agricultural output, and they are growing at about 5 to 6 percent per year (Hazell 2005). Interestingly, only about 2 percent of nontraditional high-value products are exported, and growth is being driven almost entirely by the domestic market. This raises some concerns about the longer-term growth prospects for the high-value sector once domestic demand growth slows, as some experts are predicting.

markets that offer growth potential on this scale and that could benefit huge numbers of Africa's small farmers. Many small farms could significantly increase their incomes if they could capture a large share of this market growth.

Table 2. Size of Africa's Agricultural Trade and Markets

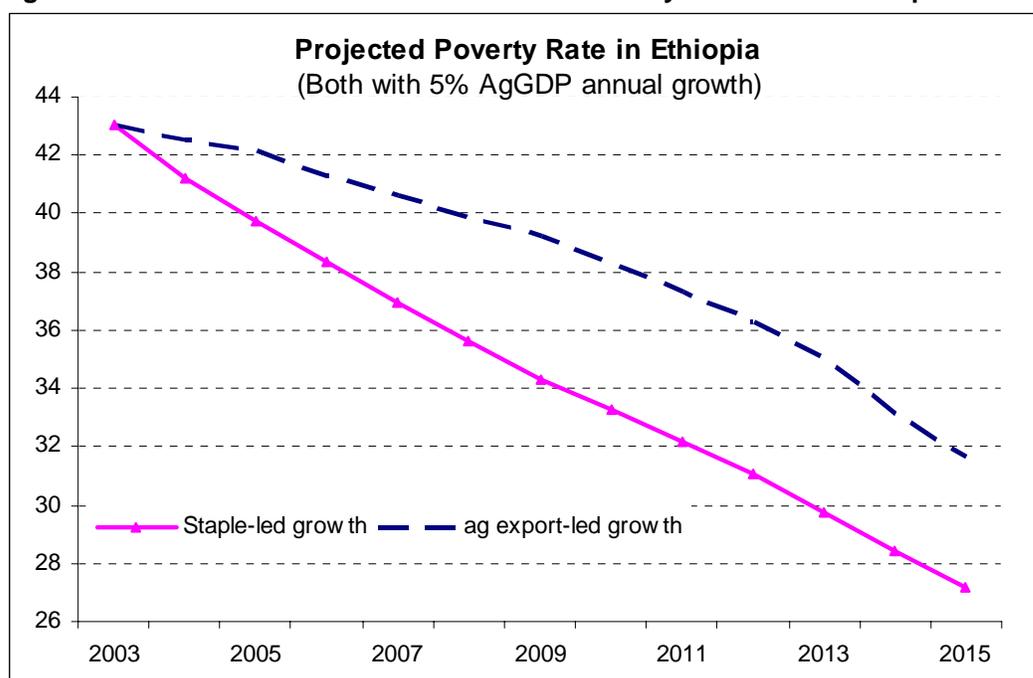
Market	Value (\$ billion)
Traditional exports to non-SSA	8.6
Nontraditional exports to non-SSA	6.0
Other exports to non-SSA	1.9
Intra-SSA trade	1.9
Domestic markets for food staples	50.0

Note: All figures are 1996–2000 averages except for domestic markets, which are 1997 figures. SSA = Sub-Saharan Africa.

Source: Diao and Hazell (2004)

Simulations with economywide models at IFPRI confirm this conjecture. Figures 2 and 3 compare simulated growth paths for Ethiopia and Ghana, respectively, from 2004 to 2015 corresponding to 5 to 6 percent per annum agricultural growth rates led by food staples versus high-value, nontraditional exports. Because of its smaller base value, the productivity of the high-value, nontraditional exports has to grow at unrealistically high rates in both countries compared with the larger food staples subsector to achieve the same 5 to 6 percent agricultural GDP growth rate.¹¹ The model balances the demand (domestic plus exports) and supply (production plus imports) for each commodity and domestic demands are allowed to grow with population and per capita income.

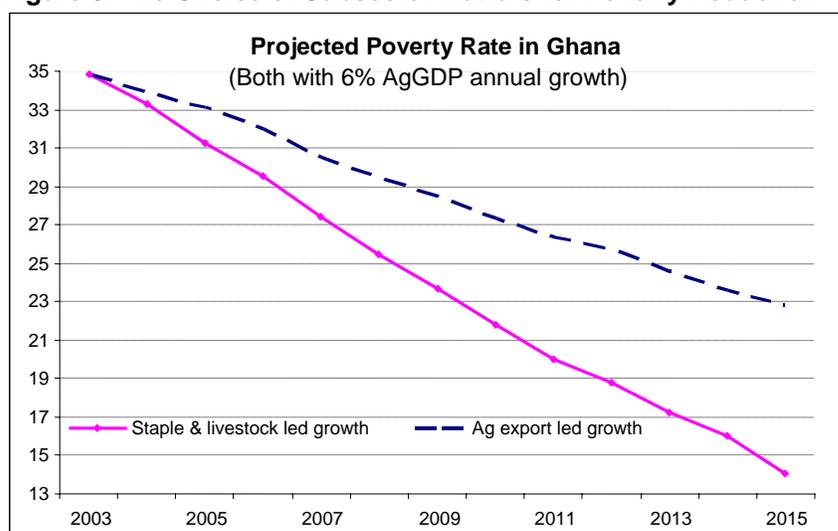
Figure 2. The Choice of Subsector Matters for Poverty Reduction – Ethiopia



Source: Author simulation model results

¹¹ To achieve 5 to 6 percent agricultural GDP growth, production of high-value exports would have to grow by about 20 percent per annum in both countries, with exports growing by 30 to 40 percent per year. Both rates are much higher than past achievements in Ethiopia and Ghana.

Figure 3. The Choice of Subsector Matters for Poverty Reduction — Ghana



Source: Author simulation model results.

The results show that not only is a 5 to 6 percent agricultural growth rate driven by food staples feasible in terms of market absorption in both countries, but it has a superior poverty-reducing impact. That is because productivity enhancements for staple crops (e.g., through technological change) benefit farms throughout both countries, reaching many of the smallest farms and the poorest areas. Staple crops also form the dominant share of household food expenditure, so productivity increases that lead to lower prices have powerful benefits for the urban poor, too. By contrast, growth in nontraditional high-value export crops only reaches farmers in the better-connected areas and has little impact on the food costs of the poor.

Additional simulations with the models show that complementary investments in infrastructure to reduce market and transport costs can greatly increase the poverty-reducing impact of growth in food staples, as does parallel development of the livestock and food staples sectors (because of the extra demand for feed grains induced) (Diao et al. 2005a).

Even in countries where food staples offer good market potential, one cannot assume that local farmers will capture a large share of that growth. That will require critical public investments to raise their productivity and to reduce production and marketing costs.

The Public Sector has a Relatively Minor Role to Play in Africa's Agricultural Development, while the Private Sector should be in the Driving Seat

As agricultural markets become more globalized and consumer driven, it is now fashionable to think that the private sector and producer organizations can perform most market chain functions. In this new paradigm, the government's role should be limited to creating an enabling environment, such as setting and regulating grades and standards, ensuring food safety, and registering and enforcing contracts. This contrasts sharply with the key role that the public sector played in food staple market chains during the early years of the Green Revolution in Asia.

There the public sector went far beyond a facilitating role and provided most key services itself, including research and development, extension, improved seeds, fertilizer, credit, storage, and marketing. Moreover, governments intervened to stabilize prices for producers and consumers alike, and provided subsidies for many key inputs to encourage their uptake. Recent work at IFPRI on India shows these interventions played a key role in launching the Green Revolution (Dorward et al. 2004,

ch. 3). They also helped ensure that small farmers were able to participate, and that contributed greatly to the levels of poverty reduction achieved. The IFPRI calculations show that most of these policies and interventions had favorable benefit-cost ratios in the early years, but the ratios worsened over time once the interventions had served their primary purposes. Unfortunately, once institutionalized, removing the interventions has proved very difficult, and as input use increased the costs to the governments soared. Today, for example, India spends about \$10 billion per year on subsidies that are basically unproductive.

The international development community is now so obsessed with post-Green Revolution problems that it is asking Africa to launch its own agricultural revolution without these kinds of public interventions. Africa is being asked to rely almost exclusively on the private sector and producer organizations. Is the international development community asking for the impossible? Is it drawing the right lessons from Asia?

Hardly any credible evidence exists to suggest that the private sector can take the lead in market chains for staple foods during the early stages of agricultural development. As farmers struggle with low productivity and high subsistence needs, low input use, low incomes, poor infrastructure, high risks, and the like, the amount of profit to be made in market chains for food staples remains low and unattractive for much private investment. There is also a growing body of studies showing that important institutional and market failures are to be expected at that level of development. It is a singular fact that no Asian country developed its food staple agriculture from a subsistence to a market orientation without heavy public intervention in the market chains. But then nor have any other developing countries.

This is not to advocate a return to costly and inefficient parastatals or to hefty and poorly targeted subsidies. Nor is it an argument against a strong role for the private sector where this can work, as in many high-value market chains. But what is really needed is a much better understanding of those aspects of public intervention that really worked in Asia and why (e.g., Dorward, Kydd, and Poulton 1998; Dorward et al. 2004). Then we can draw the right lessons for developing new institutional innovations to bring those essential ingredients to Africa.

4. Conclusions

Agriculture's role in the economic development of a country changes as the transformation proceeds. In the early stages, agricultural growth, particularly led by food staples and small farms, is a major engine of national economic growth and can play a very significant role in reducing poverty. As a country develops the agricultural sector begins to take a secondary role as an engine of growth, and the composition of its output and farm size structure changes. Labor migrates from agriculture, farms get larger, and higher-value foods become more important in the national diet and in production. Globalization and trade liberalization have weakened these traditional patterns of development to some extent, but there is little theory or evidence to suggest that today's low-income countries, especially in Africa, can bypass the need for an agricultural revolution to successfully launch their economic transformations.

Within this context, small farm development offers an efficient and pro-poor option for agricultural development during the early stages of the economic transformation. However, small farms are seriously challenged today in ways that make their future precarious. Marketing chains are changing and are becoming more integrated and more demanding of quality and food safety. This is creating new opportunities for higher-value production for farmers who can compete and link to such markets, but for many other small farms the risk is that they will simply be left behind. In developing countries, small farmers also face unfair competition from rich-country farmers in many of their export and domestic markets, and they no longer have adequate support in terms of basic services and farm inputs. And the spread of HIV/AIDS is further eroding the number of productive farm-family workers and leaving many children as orphans with limited knowledge about how to farm. Left to themselves,

these forces will curtail opportunities for small farms, overly favor large farms, and lead to a premature and rapid exit of many small farms.

If most small farmers are to have a viable future, there is need for a concerted effort by governments, nongovernmental organizations, and the private sector to create a more equitable and enabling economic environment for their development. This must include assistance in forming effective marketing organizations, targeted agricultural research and extension, revamping financial systems to meet small farm credit needs, improved risk management policies, tenure security and efficient land markets, and where all else fails, targeted safety net programs. In addition, the public sector needs to invest in the provision of basic infrastructure, health, education, and other human capital to improve market access and to increase the range of nonfarm opportunities available to small farm households, including permanent migration to urban areas. These interventions are possible and could unleash significant benefits in the form of pro-poor agricultural growth. The associated public investments could also more than pay for themselves in terms of their economic and social return.

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Discussant Remarks

Luis Llambi, Professor of Anthropology, Department of Anthropology, Venezuelan Institute for Scientific Research (IVIC), Venezuela

We have two different papers on the future role of agriculture in developing countries. Alberto Valdés and William Foster are rather skeptical about agriculture's potential contribution to growth and poverty reduction, whereas Peter Hazell and Alberto Valdés take a nuanced optimistic stance and question the skeptics' assumptions in relation to agriculture's role as an engine of growth, particularly in Sub-Saharan Africa.

Both papers deal, however, with the workshop's three parallel academic and political questions:

1. A policy issue: the real potential for pro-poor agricultural growth.
2. An empirical question: the future of small farms in an increasingly globalized (market and policy) environment.
3. Another policy issue: whether a pro-poor growth strategy could rely on agriculture and small farms, or in the diversification of rural households into nonfarm activities and out-migration to urban centers

Valdés and Foster's main argument is that a successful poverty reduction strategy is different than saving the small farm; although, they do recognize that a pro-poor growth policy has to deal with the millions of small farms in less-developed countries. Hazell and Valdés, by contrast, question the agricultural skeptics' assumptions, particularly from the standpoint of the donors' current African development challenges. They argue that despite low world food prices, food costs remain particularly high for most rural Africans because of high transport costs: "Growing food where it is needed," they assert, "is still the least costly option for many Africans."

On the argument that rural-urban migration and nonfarm rural employment have reduced the need for an agricultural growth strategy, they argue that migration driven by a stagnant rural and agricultural environment is different than migration driven by agricultural productivity growth.

Again, questioning the argument that most small farms cannot compete in today's globalized markets and hence should not be prioritized by policymakers, they assert that "small farms offer important economic and social advantages in low-income countries." They make not only the well-known *small farm efficiency* argument, but also a *demographic* argument ("to prevent premature urban migration and the explosive growth of large cities") and a *food security* argument ("a higher land productivity has the potential to help poor countries attain self-sufficiency in staples such as cereals, tubers, and livestock.")

One of the things that strikes me most about both papers, however, is their different theoretical and methodological stance. Whereas Hazell and Valdés emphasize the need to look at the broader economic context for determining the economics of farm size, and stress that to be successful small farmers require "a leveled playing field" in international markets and "policy interventions," Valdés basically draws on econometric evidence, continental and cross-country comparisons, in my view underscoring the need for contextualizing aggregate census data in their historical, local, and culturally specific context.

Other important differences between the papers are that while Valdés asserts that sustained growth (even agricultural growth) is a necessary condition for poverty reduction, he maintains we still know very little about how income distribution affects the relationships between growth and poverty, how public policies could affect income distribution, and how income distribution could affect growth. To conclude my remarks, to both authors nonagricultural growth seems to be more important than growth in agriculture, although that conclusion is nuanced when they assert that from a growth-and-equity perspective, governments and donors should allocate funds to public goods oriented to

agriculture in greater proportion than the sector's share in the gross domestic product. The best alternative then seems to be to alleviate poverty to make direct transfers (safety nets, family income subsidies) to the rural poor, according to their demographic weight in the national population.

By contrast, Hazell and Valdés's policy recommendations are slightly different:

1. Agricultural growth needs to be technologically driven.
2. It needs to be based on economic incentives, the result of an enabling public policy environment and improved public-private partnership.
3. Yet, instead of focusing on agriculture exclusively, they stress that a pro-poor growth strategy should be based on a territorial rural development perspective, in which
4. Public investments are essential not only for promoting growth on the farm, but also for strengthening rural-urban linkages.

In my view, the empirical and policy questions this workshop raises cannot be analyzed relying on econometric evidence and broadly defined regional and cross-country comparisons. It is not enough, either, to recognize that location-specific, demographic factors and sociocultural traits may explain the resilience of poor small farms. In my view, again, to answer the workshop's empirical and policy-oriented questions we need to strengthen a "real-world economics" perspective, as New Institutional Economics "market and policy failures" analyses do, but also including political-economy explanations of the reasons for governments' failures in the delivery of public and merit goods (e.g., education, including digital literacy) to rural areas in general, and to the rural poor in particular. Two additional complexities that need to be fully included in mainstream theorizing and policymaking are the vicious circles of poverty and natural resource base degradation, on the one hand, and ethnic and sociocultural differences as they relate not only to economic but also to governance issues, on the other.

Hazell's paper grounding mainstream economic theory in history and locality (different countries in Sub-Saharan Africa are different, and even regions within countries are different) takes this stance when he stresses the changing roles of the agricultural sector in economic history and look to both farm structures and the agricultural sector from a territorial rural-urban approach.

In my view, again, the real policy issue this workshop poses, at least for us in Latin America, is that, given market globalization processes, structural adjustment, and more currently Free Trade Agreements what are our policy recommendations not for saving the family farm but to foster agricultural and rural development?

My own policy conclusions are as follows:

- First, regarding the roles of safety nets and rural-urban migration: target policies to the aged, the ill, those stricken by natural catastrophes, or to the millions of so-called "nonviable" farmers. In my view, migration and remittances are not a panacea for rural communities. Their consequences instead are disrupted rural societies, urban unemployment, and extreme urban poverty (squalor, slums).
- Second, address the need for redistributive policies to solve the rural poor's lack of access to assets (in the form of land, water, working capital, human capital) and to markets and services.
- Third, address the need for a level playing field in global agrifood markets.

To end, I would like to quote Nobel Prize winner Joseph Stiglitz: "Thomas Jefferson, a great believer in democratic institutions, argued for the importance of smallholder agriculture if the newly founded American democracy was to flourish. Today, this view translates into active government support for small and medium-size enterprises. Part of the intent of the corporate restructuring currently going on in Korea is to limit the reach of this economic power. The temporary gains in efficiency may, I suggest, be more than offset by the inefficiencies introduced by excessive market power."

Discussant Remarks

Funing Zhong, Dean, College of Economics and Trade, Nanjing Agricultural University, China

The two papers have one objective in common: to reduce rural poverty in low-income countries through enhancing growth of agriculture with special emphasis on helping small farms. In their view, helping small farms is one important approach to reduce rural poverty, but not to save the small farms themselves. Because increasing the provision of public goods is essential for reducing poverty, direct government budget expenditures and other indirect policy measures are required to promote pro-poor agricultural growth.

There is a difference between the two papers in arguing for public support. On one hand, Valdés and Foster argue that more government budget should be allocated to support agricultural growth, as agriculture's contribution to general growth and poverty reduction is greater than its share in total gross domestic product (GDP). On the other hand, Hazell and Diao argue that small farms are likely to be more efficient producers if farmers are provided with adequate public support.

Apparently various policy measures including public investment and expenditures may have different effects on helping small farms and reducing rural poverty, depending on local initial conditions as well as the process of development in the region.

Of course migration and nonfarm employment are fundamental conditions for the rural population to raise its income to a level comparable with other population groups, following continuous decline of agriculture's share in total GDP. However, small farmers, especially the poorest ones in least-developed countries or least-developed areas, could do much better if they are provided with adequate public investment and expenditures on agricultural research and development, extension, rural education and training, irrigation, transportation and marketing infrastructures, and so on, which are often neglected by political leaders in less-developed countries.

It should be noted that development of human resources, or the accumulation of human capital, in poor rural areas relies on growth of agriculture, which is the main source, or even the sole source, of income for both rural households and local communities. Without a certain level of agricultural growth, rural households have no means to accumulate the necessary financial and human resources for moving out of agriculture, and local communities are unable to provide public goods to enhance human resources in the region. We have found in China that the poorest rural households had little opportunity to migrate because of a lack of financial and human capital.

It should also be noted that the strategy of industrialization does affect job creation differently—it may not always be able to absorb surplus rural laborers or facilitate rural-urban migration. From the early 1950s to the late 1970s, China followed the Russian style of a “heavy industry first” development strategy, taxing agriculture to finance fast growth of the industrial sector, especially heavy industry. Although heavy industry grew very fast in almost three decades at the costs of the agricultural and service sectors as well as consumer goods manufacturing, it did not provide employment opportunities to rural laborers on a large scale. Agriculture's share in total employment stayed at about 60 to 70 percent of the total, and the number of rural households living beneath the poverty line exceeded 300 million by the end of the 1970s.

When the reform started in 1978, the agricultural sector was first liberalized from the central planning system, leading to a remarkable real annual growth rate of 6 percent up to the mid-1980s. At the same time, the consumer goods sector was given higher priority, which not only provided better incentives for the urban population but also stimulated job creation and resulted in rural-urban labor migration of more than 100 million in addition to rural nonfarm employment of another 100 million in less than two decades. By the late 1990s, the number of rural households living in poverty had been reduced from more than 300 million to about 40 million, and about half of rural net income came from nonagricultural sources.

However, since the late 1990s, to a certain extent, the Chinese government has returned to the old development strategy, reemphasizing the growth of the heavy and chemical industries. This inevitably has had a negative impact on job creation. As a result, rural-urban labor migration has stagnated, and so has rural income from nonagricultural sources.

In conclusion, it seems that growth of agriculture is likely to be a necessary condition for further development, especially in least-developed countries or least-developed areas in low-income countries. Even labor migration and transformation of the economic and employment structures require growth of agriculture in order to accumulate necessary financial and human capital in such countries and/or areas. A pro-poor development strategy should set job creation as the top priority in allocating public funds, instead of pursuing some visible and symbolic achievements in the urban-industrial sectors. Otherwise we may end up with worsening poverty in both rural and urban areas during economic growth.

Session 1

Summary of the Open Discussion

The discussion session delved deeper into the role of agriculture in reducing poverty as well as the particular policies needed for pro-poor growth. A heated debate unfolded on the extent to which the current situation in Africa is comparable with that in Asia prior to the Green Revolution. It was proposed by some participants that African countries use the Asian experience from that period, including actively involving the public sector in shaping the economic and policy environment. One of the participants cited recent work by Sukhadeo Thorat and Shenggen Fan that shows that government subsidies at early stages enabled the small farmers to participate in the Green Revolution. Supporting recent calls from the international community to increase aid, sufficiently high levels of investment in infrastructure and institutions were highlighted as a prerequisite to get Africa over an initial threshold in order to see actual results. However, the possibility of launching another Green Revolution after market globalization was questioned by another participant. On the other hand, it was argued, however, that comparison between Africa and pre-Green Revolution Asia is not valid and the lessons are not applicable, given that the global environment has changed dramatically since the 1970s and that over the past 50 years a variety of strategies have been attempted in African countries with limited success.

The potential of high-value agriculture to generate higher incomes among Africa's small farmers was also debated. One of the speakers, Peter Hazell, argued that high-value crops that are predominantly export oriented do not hold substantial promise for the small farmers at this stage of Africa's development, while productivity increases for staple crops, which are traded in less integrated markets, would allow the smallholders to earn higher incomes. He suggested that next to staple crops, the best opportunities in Africa lie in high-value domestic markets, such as milk and dairy products.

It was mentioned that in an effort to distill the purity of agriculture's effect from econometric models, economists tend to lose the richness of contextual details that contribute greatly to shaping the situation in individual countries. Some of the participants struggled with the agriculture/nonagriculture distinction and its implications for policy formulation, given the fluidity of the boundaries between the two sectors. In addition, one participant suggested that agriculture/nonagriculture analysis overlooks the role of the service sector—which accounts for as much as 40 percent of gross domestic product in some developing countries—in providing solutions for employment creation and poverty reduction.

Session 2
Market Opportunities: Markets, Trade,
and Competitiveness

Links among Supermarkets, Wholesalers, and Small Farmers in Developing Countries: Conceptualization and Emerging Evidence*

Thomas Reardon, Professor, Michigan State University, USA

Julio A. Berdegué, President of RIMISP—Latin American Center for Rural Development, Chile

C. Peter Timmer, Fellow, Center for Global Development, USA

Thomas Cabot, Professor, Development Studies (emeritus), Harvard University, USA

Denise Mainville, Assistant Professor, Virginia Tech, USA

Luis Flores, Doctoral student, Michigan State University, USA

Ricardo Hernandez, Doctoral student, Michigan State University, USA

David Neven, Doctoral student, Michigan State University, USA

Fernando Balsevich, Doctoral student, Michigan State University, USA

1. Introduction

There has been substantial research in the past half decade investigating the rapid rise of supermarkets in developing regions and tracking the very recent and dramatic changes in their procurement systems. Both of those trends can be hypothesized to affect the wholesale sector and conditions facing small farmers. However, empirical research is only recently emerging shedding light on those effects. There is a need to lay out a framework to conceptualize the links among supermarkets, wholesalers, and small farmers, with an aim to better understand the ways in which the rise of supermarkets can affect small farmers, directly and indirectly. There is also a need to review emerging field survey evidence illustrating such links. Both of these will inform policy and program debate. This paper aims to contribute to the filling of these needs.

Besides marshaling case study evidence from several recent field studies, the paper presents a heuristic model of the choices of supermarkets, wholesalers, and farmers concerning links among them. The model combines what are usually strange bedfellows in disciplinary research: (1) industrial organization economics, (2) agribusiness strategic research, and (3) farm microanalytics. These three need to be brought to bear to analyze basic and abrupt change in food system structures, wrought by large retailers and processors, and faced by many small farmers.

We start with a review of recent evidence on the diffusion of supermarkets. We then present a model of the choice of procurement system by supermarket chains, which by extension yields derived demand for direct supply from producers or for the intermediating services of various kinds of wholesalers, who in turn choose producers. In our partial equilibrium analysis that derived demand is met by supply of products by farmers. In this paper for simplicity we don't consider processors.

2. The Rapid Diffusion of Supermarkets: Emerging Evidence and Conceptualization of Determinants

Supermarkets Spreading Quickly over Developing Regions in Three Waves

The diffusion of supermarkets represents a major concentration in the retail industry structure of developing regions. Supermarkets¹ are spreading very rapidly in developing countries, a

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¹ This is a term we use as shorthand for large-format modern retail stores, such as supermarkets, hypermarkets, and discount stores. Our discussion focuses on large-format stores and only secondarily on convenience stores, which tend to be numerous but small and typically tend to have only a small share (circa 5 to 10 percent) of modern retail sector sales.

phenomenon begun mainly in the past decade. The diffusion rates have varied over regions, characterized by three waves.²

The first wave started small³ in the early-to-mid-1990s and had built to a major force in retail by the end of the 1990s in South America, East Asia outside China and Japan, Northern-Central Europe, and South Africa. The average share of supermarkets in food retail went from a mere niche—roughly 10 to 20 percent of food retail circa 1990—to dominate the market with 50 to 60 percent of food retail by the early 2000s. Compare that to the 70 to 80 percent share that supermarkets have in food retail today in the United Kingdom, United States, or France, and one sees a trend toward convergence. Note that there is a second set of countries perched at the tail end of the first wave and near the start of the second wave that we class with the first wave, with their supermarket “takeoff” in the mid-1990s; examples are Costa Rica, Chile, South Korea, Philippines, and Thailand, all with circa 50 percent share.

The second-wave countries include parts of Southeast Asia and Central America, Mexico, and Southern-Central Europe, where the share went from circa 5 to 10 percent in 1990 to 30 to 50 percent by the early 2000s, with the takeoff occurring in the mid-to-late 1990s.

The third-wave countries include countries where the supermarket revolution takeoff started only in the late 1990s or early 2000s, reaching about 10 to 20 percent of national food retail by circa 2003. They include some countries in Central and South America (such as Nicaragua, Peru, and Bolivia), Southeast Asia (such as Vietnam), China, India, and Russia. The latter three are the foremost destinations for retail foreign direct investment (FDI) in the world and are each a fascinating third-wave case, with supermarket sector growth rates circa 20 to 40 percent per year—hence extremely fast change.

Sub-Saharan Africa presents a very diverse picture, with only one country (South Africa) firmly in the first wave of supermarket penetration, but the rest either in the early phase of the third-wave takeoff of diffusion or in what may be a pending, but not yet started, fourth wave. Kenya, Zambia, and Zimbabwe are in the early phase of the third wave and have substantial numbers of supermarkets, initiated by both domestic investment and FDI from South Africa. This investment was attracted by a middle-class base and high urbanization rates, but supermarket penetration is still only where South America was in the early 1980s. The share of supermarkets in urban food retail is about 10 to 20 percent in the large/medium cities, and the share of produce hovers around 5 percent (see, for example, Neven and Reardon 2004 for Kenya). Even with mainly domestic investment and some South African retail capital and technology, there is still considerable uncertainty about the rate at which the supermarket sector in these countries will grow.

The great majority of Africa, however, can be classified as not yet entering a substantial takeoff of supermarket diffusion: (1) At the upper end of this group are a score or so of supermarkets in countries such as Mozambique and Tanzania, Uganda, and Angola, places where South African retail FDI is just starting (see Weatherspoon and Reardon 2003 for evidence on investments by the South African chain Shoprite) and may a decade or two from now be recognizable as a fourth wave. Supermarkets in these countries show signs of early growth and are surrounded by a more general trend of the growth of self-service in relatively large semitrade stores in urban areas. (2) At the lower end of this set are the very poor countries of Africa such as Ethiopia, Sudan, Burkina Faso, and Mali. It is unlikely that the lower end of this set of countries will see supermarket growth for several decades. Even then, it will be dependent on higher urbanization rates, better investment climates, lower transaction costs, improved infrastructure, much more rapid income growth, and political stability. It will take significant improvements in most of these areas to stimulate FDI by global supermarket chains. We have shown that supermarkets, even in places like South Africa and Kenya,

² For country-specific information and more detail, Reardon and Timmer (2005), Reardon and Berdegué (2002), Weatherspoon and Reardon (2003), Dries, Reardon, and Swinnen (2004), Hu et al. (2004), Neven and Reardon (2004), and Berdegué et al. (2005).

³ In most developing countries there was a supermarket sector, albeit tiny, in a small niche in the upper-income-segment markets and large cities, and growing very slowly, in the 1980s and even before—for example, in Puerto Rico, noted as early as 1953 by Holden (1953) in the Holden-Galbraith study.

have spread beyond the middle class into the food markets of the urban working poor. But the supermarket sector usually requires a critical mass of middle-class urban consumers to build the initial base before expanding into the rest of the urban market.

Two important qualifications regarding the general diffusion patterns discussed above are to note: (1) Diffusion occurs at differential rates over intercountry space. For example, Dries, Reardon, and Swinnen (2004) note that there have been three waves of diffusion of supermarkets in the Central and Eastern European region, each wave a subset of countries. (2) Diffusion occurs at different rates over the space within a country and over socioeconomic strata. The diffusion trajectory is from large to middle to small cities and then even to rural towns, and from upper to middle class and then even to the poor. For example, in most of the first-wave and part of the second-wave countries, and starting even in some of the third-wave countries, supermarkets have penetrated beyond the food markets of the middle class into those of the urban poor.

Diffusion Driven by Demand Factors and by FDI and Procurement System Change

What factors drove the rapid diffusion of supermarkets? Reardon et al. (2003) examine the demand and supply sides of supermarket services in developing regions.

First, demand by developing-country consumers of supermarket services was and is driven by factors predictable from a services demand function with arguments including incentives and capacity variables that are similar to those that drove this demand in Western Europe and the United States: (a) urbanization (with the consequent entry of women into the workforce outside the home and increased opportunity cost of women's time and their incentive to seek shopping convenience and processed foods to save cooking time), coupled with increased demand for processed foods with rise in per capita incomes; (b) price reduction by supermarkets (relative to traditional retail) first of processed products and later of perishables (with cost reductions made possible by symbiotic evolution of technologies and procurement systems by supermarkets and processing firms); (c) real mean per capita income growth; and (d) reduction of transaction costs via access to or acquisition of private or collective capital that reduced the costs to access supermarkets (rise in ownership of refrigerators, growing access to cars and public transport).

Second, supply in developing countries of supermarket services was driven by several important factors that led to supermarkets spreading far faster in developing regions than they had in Western Europe and the United States. Two factors stand out.

On the one hand, a dramatic force for the sudden rise of supermarkets especially in the mid-to-late 1990s was the liberalization of foreign direct investment⁴ followed by an avalanche of retail FDI, entering first in the first-wave countries and then the second and then the third waves. In the 1990s and after, FDI was crucial to the takeoff of supermarkets. Domestic chains had been growing slowly before the waves of FDI, and thereafter the surviving domestic chains grew much faster in order to keep pace with foreign chains. The incentive to undertake FDI by European, U.S., and Japanese chains, and chains in middle-income developing countries, was due to saturation and intense competition in home markets and much higher margins to be made by investing in developing markets. When these chains entered in the 1990s, it induced an "investment war" among foreign chains and domestic chains, relentlessly driving market penetration as noted above, and driving consolidation and multinationalization.

On the other hand, retail procurement logistics technology and inventory management were revolutionized in the 1990s. That dramatically reduced costs, allowing supermarkets to extend beyond high-price luxury niches in the markets to penetrate the mass market for food.⁵ This was led

⁴ Reardon and Timmer (2005) argue that FDI liberalization is a more powerful component of globalization affecting farmers than is trade liberalization.

⁵ Supermarkets could then lower prices, first for processed products and very recently for fresh products, competing with small shops and even wetmarkets. D'Haese and Van Huylenbroeck (2005) show that supermarkets have lower processed food

by global chains and is diffusing now in developing regions through knowledge transfer and imitation and innovation by domestic supermarket chains. The logistics changes and other supply chain management by supermarkets were embodied in procurement system change. That change is the crucial link between the supermarket revolution and market conditions of growers, and it is discussed next.

3. Supermarket Procurement System Change: Emerging Evidence and Conceptualization of Determinants

Observed Patterns in the Evolution of Supermarket Procurement Systems

There is continuous and rapid change in procurement systems in the supermarket sector in developing regions, which in turn conditions the organizational and institutional context in which supermarkets choose farmers (and wholesalers) and influences the incentives facing and capacities of farmers regarding participation in the supermarket market channel. Note, however, that this procurement system change has occurred at sharply different rates over chains in a given country,⁶ with the three to four leading chains (with usually the majority of the supermarket market, however) undertaking the lion's share of the procurement innovations. The second- and third-tier chains and independent supermarkets, not to mention the traditional retail sector, continue to depend mainly on traditional brokers and the "spot" wholesale market. Thus, in the early phases of supermarket diffusion, farmers and wholesalers face two very different retail segments: a small set of leading chains with a small share of the food market, undertaking modernization of their procurement systems in ways that condition the requirements and incentives facing producers; and a large set of second-tier chains and traditional retailers with a large segment of the food market, manifesting traditional food market conditions and requirements. As supermarket diffusion occurs, the situation reverses, and farmers face a food market dominated by leading supermarket chains that have or are modernizing their procurement systems in ways we describe below.

The patterns of technological, organizational, and institutional innovation observed can be described as the "four pillars" of procurement system change (Berdegué et al. 2005; Reardon et al. 2003):

1. The first pillar is a trend toward centralization of procurement (per chain). As the number of stores in a given supermarket chain grows, there is a tendency to shift from a per-store procurement system to a distribution center serving several stores in a given zone, district, country, or region (which may cover several countries). This is accompanied by fewer procurement officers and increased use of centralized warehousing and sophisticated information technology and chain management. Additionally, increased levels of centralization may also occur in the procurement decision-making process and in the physical produce distribution processes. Centralization increases efficiency of procurement by reducing coordination and other transaction costs, although it may increase transport costs (shifted onto suppliers) by extra movement of the actual products. Studies from China, Costa Rica, and Brazil show estimates of roughly 30 to 40 percent cost savings from centralization.

Centralization proceeds in steps, with a shift from by-store procurement to use of distribution centers handling distribution in a zone—then a country, then a region, then globally. Reardon and Timmer (2005) note that such spatial broadening already has, and will have, increasing effects on trade levels, composition, and structure. There is (initial) evidence pointing to a "U" curve of trade content of procurement, meaning that in the early stages of supermarket establishment in a developing country, the share of imports in total sales is high

prices than local stores in small towns in South Africa. Neven and Reardon (2004) show the same for urban Kenya. We also observe similar prices for commodity vegetables between supermarkets and wetmarkets in several large cities in China (Hu et al. 2004), Mexico City (Reardon et al. 2005), and Guayaquil, Ecuador (Zamora 2004).

⁶ Note that this sharply differing adoption rate is also common to developed countries; see Kinsey (2004) for evidence from the United States.

(as supermarket supply chain development is rudimentary); as supermarkets develop their local supply chains, the import share declines, only to rise again as supermarket chains themselves regionalize and link to global sourcing networks. More research is required on this theme.

2. The second pillar is the adoption of organizational innovations comprising a shift from reliance on spot markets (in particular, traditional wholesale markets and brokers) toward growing use of specialized/dedicated wholesalers. They are specialized in a product category and dedicated to the supermarket sector as their main clients. The changes in supplier logistics have moved supermarket chains toward new intermediaries, sidestepping or transforming the traditional wholesale system. Reardon et al. (2005) note, for example, that the traditional wholesale markets in the main cities in Mexico have experienced a fall in volumes traded by 25 to 30 percent in the past two to three years; an important factor (although not the sole factor) in this rapid decline is that as supermarkets have spread, they have altered their sourcing systems toward specialized wholesalers or buying direct.

These specialized wholesalers cut coordination and enforcement costs, and enforce private standards and contracts on behalf of the supermarkets. A related development is the trend toward logistics improvements to accompany procurement consolidation and a shift in supply organization to implement those improvements. Retail chains increasingly outsource—sometimes to a company in the same holding company as the supermarket chain—logistics and wholesale distribution functions, entering joint ventures with other firms. An example is the Carrefour distribution center in Brazil, which is the product of a joint venture of Carrefour with Cotia Trading (a major Brazilian wholesaler distributor) and Penske Logistics (a U.S. global multinational firm).

3. The third pillar is the adoption by leading supermarket chains of the institutional innovation of contracts with their suppliers—in particular via their dedicated, specialized wholesalers managing a preferred supplier system for them. Such contracts are part of what the industrial organization literature terms “vertical restrictions” that fall short of full vertical integration (generally and usually avoided by both supermarket chains and food processors) but that approximate in certain ways the outcomes from vertical merger (Carlton and Perloff 2000). The contract is established when the retailer (via its wholesaler or directly) “lists” a supplier. That listing is an informal (usually) but effective contract⁷—in which delisting carries some cost, tangible or intangible. These implicit contracts sometimes include technical assistance and credit (directly or through inducing credit supply from a private bank the manager of which sees the supermarket contract as a collateral substitute); this constitutes interlinking and interlocking output-factor markets (Bardhan 1980; Eswaran and Kotwal 1985) and enables the resolution of idiosyncratic factor market failures (commonly facing small farmers today) through the supermarket-grower or supermarket-wholesaler-grower contract (Reardon and Swinnen 2004) and is paralleled in the processing industry with assistance-augmented contracts that increase enforcement and reduce holdups (Gow and Swinnen 2001; Swinnen 2004).
4. The fourth pillar of procurement system change is the rise of private quality and safety standards implemented by supermarket chains and large-scale processors. While food retailing in these regions previously operated in the informal market, with little use of certifications and standards, the emerging trend indicates a rapid rise in the implementation of private standards in the supermarket sector and other modern food industry sectors such as medium- and large-scale food manufactures and food service chains. The rise of private standards, mainly for quality but in incipience of safety, of food products and the increasing importance of the enforcement of otherwise-virtually-not-enforced public standards make up a crucial aspect of the imposition of product requirements in the procurement systems. In general, such standards function as instruments of coordination of supply chains by

⁷ *Contracts* is used in the broad sense of Hueth et al. (1999), which includes informal and implicit relationships. That best fits the relationships between growers and supermarkets in developing regions where written contracts are very rare.

standardizing product requirements over suppliers, who may cover many regions or countries. Standards specify and harmonize the product and delivery attributes, thereby enhancing efficiency and lowering transaction costs (Reardon et al. 2001; Berdegué et al. 2005; Henson and Reardon 2005).

The differences in standards between the traditional market and the supermarket market imply substantial differential investments in technology and organization by producers. That is illustrated for the case of Ecuadorian potatoes by Zamora (2004), who shows the dramatic increase in product and transaction requirements that the shift from the spot/wholesale market with few standards to a situation of application of the “four pillars,” in particular with private standards for product and transaction attributes that are much stricter than the traditional market. He notes that the traditional market demands from potato growers only (1) a certain set of varieties; (2) a maximum level of mechanical damage; (3) a minimum size; and (4) a certain color. By contrast, the supermarket channel demands (1) a certain set of varieties; (2) a certain form; (3) a maximum level of mechanical damage; (4) a level of cleanliness; (5) a level of food safety; (6) a certain odor limit; (7) a certain size; (8) a certain color; (9) a certain maturity; (10) temperature maintenance; (11) specific packaging; (12) a certain volume; (13) timing and place restrictions; and (14) a specific payment period.

Heuristic Model of Diffusion of Procurement System Innovation: Decisions of Retailers and Suppliers

Here we present a simple heuristic model of the diffusion of these procurement system innovations over chains. This is an extension of a simplified model presented in Reardon et al. (2003).

The Procurement System Choice Set of the Supermarket Chain's Procurement Officer

The choice set includes the choices of the four pillars described above versus staying with the traditional procurement system. We present this as a binary choice for simplicity; in practice the chain must also decide the degree and speed of change. The investments are in various forms of capital, and in a parallel to the term used in the technology literature, it is a vector of capital “embodying” technological, organizational, and institutional change:

1. Investment in physical capital (distribution center, electronic data transfer systems with suppliers, truck fleet, etc.); physical capital can be produced through investments or can be acquired in input markets.
2. Investment in organizational or social capital (establishment of a relationship with a specialized/dedicated wholesaler or a direct relationship with a farmer—versus simply continuing to source from the traditional “spot” wholesale market); organizational capital can be thought of as “embodied” in relationships, associations, and so on, which require investment to “produce.”
3. Investment in institutional capital (establishment of implicit contracts or preferred supplier lists, which implies derivative investments in monitoring mechanisms, technical assistance and credit provision mechanisms, product collection or reception infrastructure, or, alternatively, passing costs to suppliers); institutional capital can be thought of as “embodied” in contracts and property rights, which require investment to “produce.”
4. Investment in institutional capital (establishment of private standards, which implies establishment of testing or monitoring systems and equipment, possibly investment in certification systems or relationships with third-party certification systems).

The Objective Function of the Supermarket Chain's Procurement Officer

The typical first-tier supermarket chain in a developing country tends to be either a multinational or a large domestic firm that is in intense competition with global or regional multinationals. In the supermarket sector, there is the constant threat of new entries or attempts at entry by chains from the region or around the world. Supermarkets are also competing with the small shops and informal wetmarkets that come with an advantage of long habit, freshness and variety, and freedom from paying taxes (but which have the disadvantages of lack of economies of scale in procurement and lack of coordination or traceability in the supply chain).

The chains compete with each other and with the traditional retailers on the basis of quality differentiation for the relatively small segment of middle- and upper-income urban consumers, and on the basis of food price for the broad mass of lower-middle-income and working poor urban consumers. We assume they maximize profit subject to a "market-share first" strategy to occupy commercial territory in order to build intertemporal economies of early entry, competing for scarce real estate locations. They are assumed then to seek to do the following:

1. Minimize intermediate input cost (i.e., the net price they pay the wholesaler or farmer for procured products).
2. Minimize transaction costs (plus minimizing risk by preventing episodes of "shorts").
3. Maximize product quality (such as taste and cosmetic appearance) while minimizing quality instability over time.
4. Maximize product diversity to seek or counter spatial monopolistic competition.

Demand Side: The Adoption Decision of the Procurement System by the Retailer

The choice vector we focus on here is (1) continue to buy from the traditional wholesale market, hence spot market; (2) buy direct from farmers; or (3) buy from a specialized/dedicated wholesaler who (mainly) buys direct from farmers (imposing the standards of the chain, and using implicit contract/preferred supplier system). Here we abstract from the choice of the specific supplier, an issue taken up below.

The preceding arguments in the utility function translate into the following incentive variables in the adoption or investment function related to those choices:

1. The capacity (a vector of variables) of the traditional wholesale market to meet procurement officer objectives.
2. Alternatively, the capacity (and cost) of local farmers to supply the supermarket directly.
3. Alternatively, the ease (cost) of sourcing the products that meet the above attributes internationally.
4. The cost (for example, the interest rate) of the investment needed to meet the objectives.
5. The capacity (such as financial and management capacity) of the chain to undertake investments to meet the objectives.
6. The price vector of the competitors, hence cost competition among retailers, per consumer segment.
7. Quality and product differentiation of the products sold by competing retailers, combined with consumer effective demand for those attributes.
8. Threshold firm size to justify investments; note that there is usually a threshold quantity of stores or product throughput in a procurement system to justify use of a distribution center.⁸ This reflects a kinked investment curve for continuous variables, and a Leontieff-type (step-level) function for lumpy investments like depots or distribution centers.

⁸ In Brazil that amount is noted by de Souza et al. (2004) as 2,000 tons a month as a minimum of fruit and vegetable throughput in a chain.

9. The “importance” of the product in the chain’s competitive positioning; this is not necessarily measured in terms of share or even profitability, but can be in terms of store image or consumer “draw”; that is usually the case for produce in general and for some products that are site specific, such as avocados in Mexican supermarkets, the cost of which is used as a “gancho” (hook) to draw in consumers who will then buy other things (Reardon et al. 2005).

Supply Side: The Decision (by Wholesalers and Farmers) to Participate in Supermarket Procurement Systems

Wholesalers shift toward relative dedication to supplying supermarkets, and farmers shift toward supplying supermarkets (directly, or indirectly via their agents, the specialized wholesalers) as a function of incentives and capacity for such supply.

The incentive variables include the following; think of them as differentials of the supermarket channel, over or under the base reference point of that variable observed in the traditional market channel:

1. The price differential or premium over the traditional wholesale market that the supermarket channel can pay; note, however, that this should be observed as the price averaged over the total product including the share not accepted due to quality rejections and all deductions for shelf fees, interest costs due to lagged payment period, and so on.
2. The cost of technological change (to meet the technological and postharvest practices requirements of volume, consistency, quality, and so on, implied by the four pillars of supermarket procurement system change noted earlier).
3. The cost of “doing business” with supermarkets, including various fees, as well as waiting weeks for payment instead of receiving payment immediately as in the spot market.
4. The relative market risk of dealing with supermarket channels as compared to spot wholesale markets.

The capacity variables include the vector of “capital” discussed earlier from the supermarket side, but now applied to the supplier side; again, think of these as differentials between the supermarket channel requirement and the traditional market:

1. Holdings of technology-embodying physical capital such as irrigation equipment or greenhouses.
2. Organizational capital such as associations to aggregate product over many farmers.
3. Institutional capital, such as contracts between a farmers’ cooperative and member farmers to supply produce to the specifications of the specialized wholesaler buying for a supermarket chain.

4. Illustrations and Emerging Evidence

While the leading chains in a given country are—on average and in general—disposed to, and capable of, implementing the innovations above, one sees substantial variation in adoption of the innovations over supermarket locations in a given country, and over product categories. For example, a chain might adopt the procurement innovations for processed products but not fruit, or for watermelons but not tomatoes, thus setting up a preferred supplier scheme, opting to have watermelons delivered to a distribution center under implicit contract, applying private quality norms, but opting to continue to just send a truck to the traditional wholesale market for tomatoes each morning. Moreover, the type of producer chosen (large versus medium versus small farmers) can differ a lot over products, for a given supermarket chain in a given country, or over countries for a given product.

Given the limited scope of this paper, below we merely illustrate this variation, drawing on the conceptual framework to explain, or in some cases merely hypothesize, reasons for the patterns observed. In general the emerging cases can be explained by the conceptualized determinants discussed above.

Illustrations of Procurement System Choices of Retailers

A Guatemalan Illustration

Berdegú et al. (2005), Hernandez et al. (2004), and Flores (2004) show for the case of the La Fragua supermarket chain in Guatemala the use of a mix of procurement systems for produce, depending on the type of produce.

First, there has been a clear application of the first pillar of change—centralization. La Fragua's produce procurement office operates a large distribution center for the country. In 1999, 20 percent of its produce passed through the distribution center (as opposed to direct to stores) versus 98 percent in 2004 (while the overall volume quintupled). The reason for this shift was to save on coordination costs and centrally monitor quality.

Second, there has been a marked shift toward two of the other pillars of procurement change—an increase in direct sourcing from farmers as well as a shift to reliance on specialized wholesalers, but with great variation over product categories, explicable by the above discussion.

In 1999, 25 percent of the produce came directly to them from producer-suppliers (as opposed to wholesaler-suppliers delivering from rural areas or from the wholesale market), and by the end of 2004 more than 40 percent came directly from producer-suppliers.

The main category of fruits and vegetables procured is “large-volume products”—roma (cooking) tomatoes, potatoes, bell peppers, melons, and watermelons (together 30 percent of La Fragua's produce). In 1999, 40 percent of this category was centralized; now 100 percent is sourced from a half dozen large wholesaler-intermediaries that buy from the wholesale market and thus from thousands of small farmers. Since 2000, La Fragua has been exploring sourcing directly from farmers, but it is faced with several problems: (1) There is virtually no investment in irrigation or greenhouses at the farm level in these commodity products, due to the high cost of such investments relative to the low profit rates. That means the products need to be sourced over a number of production zones over the year to get constant supply, implying high transaction costs for direct sourcing. In particular, roma tomato and potato growers are quite scattered geographically and tend to be very small producers. (2) The very-smallholder nature of production and the lack of irrigation and greenhouses implies that there is great variety in product quality, and thus there are high sorting costs that retailers prefer to pass on to wholesalers handling large volumes. (3) Retailers tend to want product harvested and delivered fresh daily, again a source of high transaction costs that small producers are unwilling to undertake. Thus, La Fragua still relies on wholesaler-suppliers for these basic commodities because of the limitations of growers. Wholesalers perform the service of selection and grading (that La Fragua did itself in the 1990s) to get the best quality from the large volumes coming into the wholesale market.

Why then does La Fragua still work actively to establish direct sourcing from growers of these items? (1) It wants to avoid wholesaler margins. (2) There is no traceability to growers when using wholesalers, which constrains the shift over time to implementation of quality and safety standards. The shift to direct sourcing through a producer-supplier system will be a function of the cost of investments by farmers (in greenhouses) and La Fragua (in coordination) against the benefits of foregone payments to wholesalers and increased quality consistency of these bulk products.

The next category is “medium-volume bulk products”: carrots, cabbage, lettuce, onions, and salad tomatoes (together 15 percent of produce sales) and other main fruit (limes, oranges, papayas, and pineapples). Five years ago, 20 percent of this category was centralized, now 100 percent. In

1999, 70 percent of this category was sourced from the wholesale market—and today only 30 percent comes from the market (most limes, onions, oranges, and papayas) and 70 percent now comes from preferred-list producer-suppliers. Each product has only one or two suppliers. The greens and carrots require daily harvest and fast delivery and thus well-organized and equipped producers. In some cases, such as lettuce, a large amount of the supply comes from either commercial companies, who have smallholder contract schemes, or several small farmer associations that bulk the product from many small farmers and ensure quality (Flores 2004).

The next category is bananas, the largest single item (8 percent of sales), now sourced from large producer-suppliers.

The next category is “low-volume greens”: celery, spinach, and herbs such as cilantro and mint. In 1999, 20 percent was sourced from producer-suppliers and the rest came from the wholesale market, and all noncentralized. By 2004, all but the herbs were centralized and all were bought directly from producer-suppliers, usually small growers near the city, performing the service and labor-intensive care required to grow and deliver these delicate items.

The last category is “seasonal products”: high-volume products such as mangoes, and low-volume fruits. In 1999, 20 percent of the mangoes was purchased from preferred suppliers from their own farms, and the rest from the wholesale market; 20 percent was centralized. As of 2004, 100 percent came from producer-suppliers, and 100 percent were centralized.

In sum, La Fragua has adopted “on average” the four pillars of procurement system change, but with very substantial variation over product types, mainly due to the supply characteristics of the different products at present in Guatemala. The most common changes across products are centralization of procurement through the distribution center and the imposition of private standards of quality; the least commonly shared change is the shift to preferred-supplier systems and away from the wholesale market. The traditional procurement system of sourcing from the wholesale market persists mainly for the set of basic vegetable commodities, albeit with a tendency to focus on several large wholesalers in the wholesale market who can meet the quality, consistency, and volume requirements of the chain. Moreover, small farmers figure substantially in product supply to the chain, either through the wholesale market for several key commodity vegetables such as roma tomatoes or through specialty perishables such as lettuce. By contrast, several medium and large producers are key to the supply of some bulk vegetables and many fruits. The variation in sourcing over farmer types is driven by transaction costs and access to medium and large farmers willing to supply the supermarkets. It also reflects the size distribution of farms by type of produce; in Guatemala one tends to find a relatively flat distribution of farm size (mainly small) in vegetables for the local market and a skewed distribution for tropical fruit such as bananas.

A Kenyan Illustration

Neven and Reardon (2004) show for the case of Uchumi, a main supermarket chain, in Kenya the use of a mix of procurement systems for produce, depending on the type of produce.

For vegetables, which make up 45 percent of the value of produce sold at Uchumi, roughly 50 percent is sourced directly from growers. Medium-sized producers supply the largest share, 25 percent, followed by large farms at 15 percent, and small farms at 10 percent. Brokers supply 45 percent of Uchumi’s vegetables, while the rest (5 percent) is imported. Small farmers supply mostly leafy greens (kale, spinach, traditional African vegetables) and vegetables sold in small volumes (e.g., herbs). Other vegetables are supplied by the larger farmers. The latter especially applies to fresh-cut vegetable packs because most small-scale farmers do not have a packing shed, which in this case is a key requirement. Currently large farms supply 75 percent of fresh-cut vegetable packs, and that percentage is expected to increase to 90 percent over the next five years. Brokers mainly resolve shortfalls.

For fruits, which make up 55 percent of the value sold, Uchumi sources 35 percent directly from growers—15 percent from large-scale farms, 10 percent from medium-sized farmers, and 10

percent from small producers. Imports represent roughly 25 percent of procured fruit, and the remaining 40 percent is supplied by brokers. Small farms play only a small role with regard to fruits (examples of fruits where they are involved are watermelons, passion fruit, and strawberries). For fruits there is a heavy reliance on brokers (because they buy mangoes, for example, from smallholder producers in different regions of the country as the seasons change), large-scale farms/plantations (e.g., Kakuzi, a 6,400-acre agrifood business listed on the Nairobi Stock Exchange), and imports. As a group those three suppliers represent 80 percent of Uchumi's fresh fruit supplies.

As Uchumi's sales of produce increase, it is moving away from traditional brokers (and their long supply chains *and* the mostly smallholder producers they buy from) to get supplies directly from farmers. Brokers, as a source of produce, have decreased from the main supplier category (70 percent in 1997) to less than 50 percent in 2003 (45 percent of vegetables and 40 percent of fruits). Reducing its reliance on brokers is the first priority at the moment for Uchumi's produce procurement, and management expects that by 2008 brokers will make up no more than 10 percent of supplies—that is, they will be used only to resolve shortfalls from regular suppliers (similar to Freshmark, Shoprite's produce procurement arm in South Africa; Weatherspoon and Reardon 2003). Direct supplies by farmers allow supermarkets to increase simultaneously control over quality, supply reliability, and price stability and thus make them more competitive with traditional retailers.

In sum, as in the case of La Fragua, Uchumi tends toward adoption of the four pillars of procurement system change, with a similar attempt to shift toward direct sourcing from farmers where possible. Again, there is substantial variation in average farm size over products; again, as in Guatemala, there is a relatively flat distribution of farm sizes for many domestic vegetables, and thus the chain draws on smallholders, while for some vegetables and a number of fruits there is greater skewedness in farm size distribution and a tendency to draw on medium and large farmers where available.

A Brazilian Illustration

Mainville et al. (2005) examined produce markets in Sao Paulo, Brazil, and focused on sourcing by leading chains such as CBD (the largest chain in Brazil, mainly of domestic capital, but in joint venture with a French chain, Casino) of tomatoes and lettuce. Several key points emerged.

CBD shifted from a decentralized (store-by-store) to centralized (in a large distribution center) procurement system for produce from 1998 to 2004. CBD implemented a preferred-supplier system, shifting from sourcing directly 38 percent of its produce to 70 percent in 2002. That allowed important reductions in spoilage losses.

The system differs substantially, as in the above cases, between low-profit commodity products such as tomatoes and niche products that are highly perishable, such as lettuce.

In the case of highly perishable products in which quality is most important, the shift was complete: in 1997 CBD sourced only 10 percent of its lettuce from direct procurement, whereas by 2002 that share was 100 percent. In the past several years, there has been a significant reduction (three quarters) in the number of suppliers as CBD culled for those able to meet the quality and logistics requirements. As in the previously discussed cases, the more capitalized small and medium farmers were retained. The investment requirements in terms of production and postharvest (cold chain) are substantial.

In the case of commodity tomatoes, those still are sourced from wholesalers, but with the shift, as in the cases above, toward specialized/dedicated wholesalers who also have packing plants in production areas. In contrast to lettuce, but like commodity tomatoes in the Central America case, the investment requirements at the production and postharvest levels are not substantially different for the supermarket channel.

Emerging Evidence from Grower Surveys

The evidence concerning the grower-level impacts of supermarkets on producers is far more recent and partial, but it points toward a similarly mixed picture.

First, a relatively unambiguous picture appears to be emerging of exclusion of small processing and food-manufacturing firms in supermarket procurement systems in developing countries. While there are very few studies on this, the forces leading to exclusion seem to aim in just one direction. For example, Hu et al. (2004) note that whereas supermarket chains in Beijing tend to increase the diversity of processed products, they show a strong tendency to select a small number of medium-to-large firms capable of delivering a consistent-quality product at large volumes. This ensures “one-stop shopping” for the chains—that is, a given firm is able to supply a diversity of product lines in order to reduce transaction costs for the chain. The chains reap economies of scale from large volumes of processed products moving through their distribution centers, and they seek to work with larger firms that can ship to their centers or have their own distribution centers that they can use to distribute to stores. This is an international trend, although seen vividly in the rapidly changing Chinese supermarket sector. Hu et al. (2004) noted an example of a Beijing chain that cut its number of processed food suppliers from 1,000 to 300 in one year once it had its distribution center in place and could consolidate suppliers. Dries and Reardon (2005) note a similar tendency in Russia for dairy products, and Balsevich et al. (2004) for meat products in Costa Rica and Nicaragua. Moreover, the effects on the majority of growers are felt indirectly, via the choice by supermarkets of larger processors, as processed food constitutes half to two-thirds of the food sales of a typical supermarket or hypermarket in developing regions.

Second, however, changes in supermarket procurement systems also affect growers directly in the case of fresh fruit and vegetables—and thus the processing sector does not mediate the link between farmers and supermarkets or the wholesalers that serve them, which is why most studies of supermarket effects directly on producers have been (only in the past year) in this category. There have been several recent studies of growers supplying supermarkets—in Kenya (Neven. 2004) Nicaragua (Balsevich et al. 2004) Guatemala (Flores 2004 and Hernandez et al. 2004); and Ecuador (Zamora 2004), for example. The results from the new studies tend to show the following:

First, small farmers are involved in supermarket supply chains in these case study countries. There can be substantial involvement of small growers, such as in commodity tomatoes in Nicaragua and Guatemala and lettuce in Guatemala.

Second, however, just as it is not the poorest and smallest farmers who tend to produce fruits and vegetables, among growers of the latter it tends to be the upper tier in terms of assets (*not necessarily in terms of size*, but in terms of physical, human, and organizational capital) who supply supermarkets. This is clear in all the cases noted above. By contrast, where small farmers do not have the requisite capital to make the grade, supermarkets tend to reduce the ranks of preferred suppliers to the tier of small farmers who have the requisite capital, or to medium farmers, as illustrated for potatoes in Ecuador (Zamora 2004) or vegetable producers in Thailand (Boselie 2002).

Third, the net benefit of selling to supermarkets relative to selling to traditional markets tends to be much higher in products (“noncommodities”) compared to commodities. For example, Flores (2004) shows that Guatemalan small farmers with the range of capital sufficient to allow them to sell lettuce (a niche crop) to supermarkets earn several times more (in net terms) per hectare than do small farmers selling to traditional markets. By contrast, for Guatemalan commodity tomato producers, Hernandez et al. (2004) shows that there is not much difference in net returns between selling to wholesalers selling to supermarkets versus wholesalers selling to traditional retailers, although there is a perception that the market risk is lower when a farmer enters a relationship with wholesalers dedicated to the upper-tier market, such as supermarkets, which requires a constant and consistent supply of a certain commercial quality.

Fourth, farmers’ associations or cooperatives tend to be necessary (to reduce transaction costs) but far from sufficient; growers can use them to facilitate entry into the market, but a range of

other threshold investments in management, institutions to ensure collective compliance with supermarket standards, and physical capital are needed to keep farmers in the dynamic markets (see Berdegúe 2001 for the case of Chile and Jano et al. 2004 for cases in Central America).

5. Conclusions

In general, evidence from studies of the procurement system choices of leading supermarket chains supports a general tendency to a shift toward the innovations represented by the four pillars (centralization, shift from traditional wholesale markets to specialized/dedicated wholesalers, shift from spot market to de facto, implicit contracts via preferred supplier systems, and the rise of private standards). This is important to small farmers because there is parallel evidence that in many developing countries supermarkets are rising quickly to dominate the dynamic urban market, and thus to become key “mediators” of new market opportunities for small farmers.

Controlling for the type of chain (we have dealt exclusively here with the dominant, leading chains), there are, however, substantial differences over products, mainly reflecting the relative abilities of local producers (acting directly) and imports versus extant local wholesale markets to satisfy the requirements of the supermarket chain. Very roughly calculating, one can say that even leading supermarkets have made the shift only at most halfway (40 to 50 percent) away from wholesale markets. That means that for at least half of their product, they are still sourcing from wholesale markets, and in most countries in all regions, that means from thousands of small farmers, via traditional wholesalers.

But the fact that the shift is still only partial does not negate that most indicators point to a continuation of the shift toward direct sourcing, at very variable rates depending on the country, the chain, and the product. Whether supermarkets source directly, or via specialized wholesalers, there is a general tendency (irrespective of region) to prefer sourcing (where possible) from *more capitalized farmers* who can meet the requirements of the chain; the good news for the future of small farmers is that these are not necessarily large farmers but can be and often are simply the upper tier of small farmers, the commercialized small farmers with the adequate vector of technological, organizational, and institutional capital. In some cases export firms or large farmers are available to source from, and they are typically preferred because of the low risk and transaction costs they imply. But a rough estimation is that in all regions the large or export farmer is on average not the main provider of fresh products to supermarkets, but rather it is the medium and the small-but-capitalized farmers that are dominant in the sourcing done directly or via preferred suppliers, and that that trend will continue for some time, and grow. That then clearly points to the need for development programs to apply themselves to building the capital needed by small farmers to access these markets where that access is identified as poverty alleviating and beneficial to the small farmers.

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Commercializing Small Farms: Reducing Transaction Costs

Prabhu Pingali, Director, Agricultural and Development Economics Division, Food and Agriculture Organization (FAO), Italy

Yasmeen Khwaja, Consultant, Agricultural and Development Economics Division, Food and Agriculture Organization (FAO), Italy

Madelon Meijer, APO, Agricultural and Development Economics Division, Food and Agriculture Organization (FAO), Italy

1. Introduction

Food markets in developing countries are undergoing profound changes fueled by economic development, increases in per capita incomes, changing technology, and urbanization. Higher incomes and increasing numbers of women in the labor force mean greater demand for high-value commodities, processed products, and pre-prepared foods. Urbanization increases the scope for economies of scale in food marketing and distribution, while reductions in transaction costs increase the size of the market for distributors and retailers. The result is an impressive increase in the volume of food marketing handled by supermarkets, but also substantial organizational and institutional changes throughout the food-marketing chain (Dolan, Humphrey and Harris-Pascal 2001). Such changes include the setting of private grades and standards for food quality and safety and the adoption of contracts between buyers and sellers at various points along the food-marketing chain.¹ Subcontracting for products of specified quality and traits is likely to proliferate as a form of interaction between retail food chains and producers. If regions where supermarket retailing is more developed (e.g., Latin America) are a precursor of what will follow elsewhere, then supermarkets and large-scale distribution will progressively dominate the food-marketing chain in urban areas.

However, concentration of food trade in the hands of a few retailers and large market intermediaries threatens the existence of small traders and small businesses, central “spot” food markets, and neighborhood stores. On the production side, such trends may mean the gradual disappearance of those smallholders who are unable to meet the private standards of health and safety set by large retailers and wholesale buyers as well as neighborhood stores and spot wholesale markets (Dolan, Humphrey, and Harris-Pascal 2001; Reardon and Berdegúé 2002).

The pressures to meet the requirements of a more exacting food system have brought with them a renewed interest in small farm welfare. For the small farmer there are difficulties to commercialization that arise from poor public good provision that hinders market exchange and a new set of transaction costs that emerge from dealing with a food system characterized by different rules, regulations, and players.

Although agricultural commercialization puts increased emphasis on specialization, that is not confined to the production of high-value crops. For many farmers the transition to commercial staple crop production is far more pertinent. The structural changes in the food system brought about by commercialization have raised the costs of exchange for both staple and high-value crop producers. These *transaction costs* are a significant variable that can inhibit small farmer entry into competitive markets. Even commodities are becoming differentiated products because of the particular requirements to meet the quality, size, and delivery standards, and new transaction costs have emerged that have raised the cost of entry even more into certain product markets.

The principal challenge confronting governments and the international development community is to ensure that smallholders and other rural poor benefit from commercialization, either through participation in the market or by successfully exiting agriculture and finding employment in different sectors. There is some compelling evidence to suggest that increased transaction costs deter entry of small farmers into the market. Thus, interventions aimed at reducing transaction costs could encourage increased farmer participation in competitive markets.

¹See Reardon and Berdegúé (2002) and Reardon et al. (2003) for a more comprehensive coverage of the issues related to the proliferation of supermarkets.

Here we consider the relationship between transaction costs of small farmers and their potential to trade in domestic as well as international markets. The next section looks at the key issues facing small farmers in the commercialization process. Section 3 identifies the constraints that prohibit market entry for many small farmers with the emphasis on transaction costs. Section 4 looks at how the private sector can overcome costs of market participation by small farmers. In section 5 we consider the policy focus.

2. Commercial Transformation of Food Production Systems

The issue of agricultural commercialization and the small farmer is by no means new. Most developing countries have witnessed agriculture “moving away from traditional self-sufficiency” to an activity where “farm output is . . . more responsive to market trends” (Pingali and Rosegrant 1995, 172). It has long been understood that with increasing economic growth, small farm production systems could not remain static and would need to gear themselves to some degree of commercialization for their survival. The commercialization process today has a very different face from even that of 10 years ago. What is new in the story of commercialization is the focus on agribusiness, and the scale at which agribusiness is influencing the process of change. There is a much greater degree of integration between producers and the output market, with a strong emphasis on standards in relation to quality and safety. In this section we discuss the evolution from subsistence to commercial production systems and ask whether small farmers can be successfully integrated into the new agrifood system.

Food production systems can be characterized as subsistence, semicommercial, and commercial (Pingali and Rosegrant 1995). Increased commercialization shifts farm households away from traditional self-sufficiency goals and toward profit- and income-oriented decision making; farm output is accordingly more responsive to market needs. The returns to intensive subsistence production systems that require high levels of family labor generally decline relative to production for the market with predominant use of purchased inputs. Initially, diversification implies the addition of other crops and other enterprises to staple-based systems. As the level of commercial orientation increases, however, one observes mixed farming systems giving way to specialized production units for the production of high-value crop and livestock products. Commercialization, while leading to an increase in the diversity of marketed output at the national level, also leads to increasing regional- and farm-level specialization.

Although the speed of the above structural transformation differs substantially across countries, they are all moving in the same direction. Timmer (1988) provides a comprehensive discussion on the process of structural change and commercialization of agriculture. For a recent review of agricultural commercialization, see Reardon and Timmer (2005), Pingali (1997), and Pingali and Rosegrant (1995). Empirical evidence on commercialization trends is provided by Dyck, Huang, and Wailes (1993) for East Asia; Huang and Rozelle (1994) for China; Koppel and Zurick (1988) for Southeast Asia; and Naylor (1992) for Indonesia.

While economic growth and diet diversification have been the driving forces of agricultural commercialization, the move toward integration into the agrifood system is induced by globalization trends. Globalization has resulted in the rapid growth of world trade, internationalization of production by multinational corporations, and declining informational and communications costs associated with information technology. The potential trade² benefits for agriculture arise from two aspects. The first stems from the possibility of direct increased exposure of agriculture to international competition. The ability to access global markets and specialize in areas of comparative advantage could yield high gains for this sector. The second stems from the indirect effects of increased international trade on the growth of nonagricultural sectors, changing the domestic demand for agricultural goods both quantitatively and qualitatively (Pingali and Khwaja 2004).

² Throughout this paper we assume that trade refers to *both* international and domestic markets.

Given the potential for high rewards, the structure of food systems has radically altered with globalization. Traditional food systems were essentially *production* systems that were highly linear and involved only rudimentary processing and minimal distribution. Modern food systems, on the other hand, are highly integrated with greater forward and backward linkages and significantly involve the private sector in determining standards and market regulations (Rondot, Biénabe, and Collion 2004). Moreover, they are systems that exhibit an ever increasing degree of technological and process innovation. As such these modern food systems are much more discriminatory in terms of who is able to enter.

An inspection of any modern food chain illustrates that the relationships within the chain are much more complex. This implies, in turn, that there are far more informational uncertainties within the food system resulting in having to exchange on a different contractual basis than before. New standards require better screening and monitoring precisely to ensure quality and safety requirements (Boehlje 1999). These informational requisites incur costs that tend to diminish with farm size. Thus, entering the food system on a competitive basis is problematic for small farmers because of physical investments needed to enter but also because of the transaction costs associated with the new agricultural market.

Implications of Commercialization for the Small Farmer

Small farmers face two main difficulties in trying to adapt to modern food systems. The first concerns their ability to commercialize from production systems that are often semi- or fully subsistence, and the second concerns the actual crop or enterprise choice.

There is a considerable literature that testifies to the productive efficiency of small farms. On the basis of that, it is argued that small farms, if they can overcome some constraints, are well placed to enter markets. A number of empirical studies, among them those by Van Zyl, Millor and Parker (1996) and Binswanger and Elgin (1992), conclude that small-scale family farms tend to be more productive than large farms. Eastwood, Lipton and Newell (2004) present an extensive review of the literature on small farm productivity. The major reason cited for higher levels of efficiency is the higher productivity of farm-family labor and lower supervision costs compared to large farms.

However, that efficiency is often rooted in traditional crop production, often for own-consumption purposes. The difficulty for small farmers is whether the existing production structures can be geared toward the market and at what cost. The alternative is to remain in a form of production that is semi- or fully subsistence. Over time, subsistence farming in any form is not a viable activity for safeguarding household food security and welfare (Pingali 1997). What policymakers then need to consider is what the best exit strategies are for farmers who cannot remain in farm production.

The rapid changes in the food system have put increased pressures on small farmers to diversify away from staples and harness the lucrative gains that derive from the production and trade of high-value crops. This often seems to imply that small farmers face an either/or option in terms of their crop choice. Small farms either stay in staples, which are regarded as unprofitable, or they make the changes to shift to alternative high-value production. The potential gains from high-value crops tend on average to be higher than those for staples even though production of high-value crops can be accompanied by greater uncertainty and risk. For small farmers specializing in high-value output, a critical question remains as to whether their size can profitably support such activities long term.

In addition, to a large extent crop choice is determined a priori by the land potential available to small farmers. So, while high-value crop production may promise higher rewards, that option is not open to all small farmers. For some small farmers, at best, commercialization can offer the possibility of some diversification into nonstaples, but not a total specialization. So-called high-potential lands may be able to make a permanent transition to high-value crops, but low-potential and marginal lands tend to be best suited to traditional crops, which are often staples (Pingali 1997). Moreover, for some

farmers any kind of production on marginal lands may not be feasible long term, in which case the emphasis needs to be on developing nonfarm rural employment to support production.

While many small farms have a comparative advantage in staples production and will continue to do so, the income generated from that commercial activity alone is unlikely to maintain household welfare long term. We are more likely to see diversification in the portfolio of income sources than in terms of crops for such households. Migration to towns by one family member or migration into rural nonfarm employment tend to be likely strategies for increasing household income.

The players, rules, and relationships within new commercialized food systems are often alien to the small farmer (Napier 2001) and raise the cost of entry into the market in two ways. First, there are increased costs of production stemming from the investments needed to meet the requirements of the output market. Second, there is a greater level of exchange with new players in input and output markets, which is inevitably more costly. Not surprisingly, the new food systems tend often to favor scale. Moreover, poor public good provision and the absence of adequate regulation can interact with the specific requirements of commercial markets to exacerbate transaction costs further. The distinction between high-potential and low-potential areas in the transition toward commercialization takes on a much broader meaning. It is no longer restricted to the physical land capabilities of an area or region but also to the ability of the wider rural sector to adapt to change.

3. Transaction Costs in Modern Agrifood Systems

The issue of transaction costs has always figured in agricultural markets. In many instances they explain missing markets—for example, in credit markets (Besley 1994), labor markets (Bardhan 1984), and land (Carter and Mesbah 1993) as well as the product markets (Stiglitz 1998; Holden and Binswanger 1998). Such failures can result in alternative institutional arrangements (Binswanger and Rosenzweig 1986; Timmer 1997) such as sharecropping and interlinked markets (Bardhan 1980; Braverman and Stiglitz 1982; Binswanger, Khandkar, and Rosenzweig 1993).

Before elaborating on the new set of transaction costs that has arisen with the appearance of modern food systems, we briefly elaborate on how transaction costs can be defined.

Williamson (1979, 1993, 1996) defines transaction costs as a trade-off between the costs of coordination within an organization and the costs of transacting and forming contracts in the market. That trade-off will depend on the magnitude of the transaction costs. According to the seminal work of Coase (1937), it is precisely because of the presence of transaction costs associated with information, negotiation, monitoring, coordination, and enforcement of contracts that intermediary firms emerge to economize on such costs. A substantive volume of literature has been built on this work and applied to agricultural markets. Building on Coase's work, Hobbs (1997) classified transaction costs into information, negotiation, and monitoring or enforcement costs. Information costs, for example, arise *ex ante* of an exchange. Negotiation costs are the costs of physically carrying out the transaction, while monitoring costs occur *ex post* of a transaction and include the costs of ensuring that the terms of the transaction (quality standards and payment arrangements) are adhered to by the other parties involved in the transaction. Others have distinguished transaction costs between tangible (transportation costs, communication costs, legal costs, etc.) and intangible (uncertainty, moral hazard, etc.) costs (Cuevas and Graham 1986; Holloway et al. 2000 in Birthal, Joshi, and Gulati 2005).

In addition to the above, with the rise of modern food systems, a new set of transaction costs has arisen because of the standards required in terms of quality, size, and delivery. Private companies, in order to capture markets and differentiate their products, put ever more stringent conditions on suppliers. Customers are increasingly willing to pay for product attributes that include convenience, taste, variety, high quality, and low caloric intake (Napier 2001). It is precisely because many small farmers are locked into traditional modes of production far removed to meet the requirements demanded by modern food systems that transaction costs have tended to become prohibitive. These factors go some way to explain why smallholder farmers do not participate fully in

commercialized agricultural markets. This section considers the nature of transaction costs and how they constrain the possibility to enter markets.

Transaction costs are faced by all actors in the food system. We focus in particular on agrifood companies trying to contract small farmers and small farmers trying to integrate into the modern food supply chain. The tendency is to move away from the spot market to other forms of vertical coordination (Boehlje 1999). That is because there is a continuous need for information sharing on consumers' changing preferences, on quality requirements through grades and standards, and on high postproduction and service value addition, which requires specific investments. Open-access markets can no longer meet consumer needs for accurate information on quality and safety attributes (Van der Vorst 2005).

Transaction Costs Specific to the Agribusiness Firm

Modern food systems are typically characterized by near-monopsonistic markets. Whilst the number of potential suppliers (small farms) is large, the costs of exchange—the transaction costs—between small farmers and a few large buyers can be substantive. If the transaction costs are prohibitive, exchange will not take place.

The transaction costs that specifically emerge from dealing with large numbers of small farms are as follows (Hayes 2000):

- The bureaucratic costs associated with managing and coordinating integrated production, processing, and marketing.
- The opportunity cost of time used to communicate with farmers and coordinate them.
- The costs involved in establishing and monitoring long-term contracts.
- The screening costs linked to uncertainties about the reliability of potential suppliers or buyers and the uncertainty about the actual quality of the goods.
- The transfer costs associated with the legal or physical constraints on the movement and transfer of goods. They also include handling and storage costs, transport costs, and so forth.

While some transaction costs are related to physical costs such as transportation and packaging, other costs are the outcome of informational asymmetries and contract enforcement problems that force agents to incur expenditures associated with search, supervision, and management.

Farm-Specific Transaction Costs

For farmers, transaction costs are those associated with participation in the—increasingly vertically coordinated—markets. Such costs can be household specific, such as access to assets, or they can be the same for all farmers in a particular location, such as land quality, or producing a specific product, such as perishable fruit and vegetables. It is the bundle of transaction costs that farmers face that determines market participation. Interactions between the unique features of food system participation and other household- and location-specific characteristics can further exacerbate transaction costs. Farmers will not enter markets when the value of participating is outweighed by the costs of undertaking the transaction (Sadoulet and de Janvry 1995).

Specific transaction costs can arise in both the input and output markets and affect market participation. Evidence from Bangladesh (Ahmed 1989) found that transaction costs resulting from loans from formal lenders are higher than those of loans from informal lenders because the borrower is usually known. By contrast, transaction costs per unit of loan decrease with loan size, and this was much faster for formal than for informal loans.

Transaction costs in output markets, for example, can affect the choice of market channel farmers use. In Ethiopia grain brokers have been shown to be the preferred choice among small farmers (Gabre-Madhin 1999). Farmers identify where to trade and then decide on whether to use a broker to search on their behalf. High transaction costs were linked to increased broker use because farmers spent time searching for information on markets and prices. Where farmers had better information on prices and market because of social networks, broker use was significantly less.

Location-Specific Transaction Costs

Variances across regions matter in determining the level of transaction cost. Farmers in high-potential areas may experience a lower total level of transaction costs than those in low-potential areas. First, higher-potential areas have more reliable access to production inputs and markets and hence face lower costs and risks associated with the switch to high-value crop production—the exception being the irrigated rice lowlands, where the drainage costs associated with growing nonrice crops tend to limit short-term movement between rice and other crops, particularly in the wet season (Pingali, Hossain, and Gerpacio 1997).

Second, high-potential areas generally have better transport and communication infrastructure and hence relatively lower search and information costs. Where road density is low (often the case in low-potential areas), accordingly transaction costs associated with accessing markets and information tend to be high. Poor road infrastructure increases transportation time and therefore costs. The price that farmers receive will be net of some of these costs if not all, reducing the incentive to enter commercial agriculture. Distance to a paved road can have a significant negative effect on fertilizer use because of the transaction costs associated with the time it takes to search for inputs (see Strasberg et al. 1999). Poor communication prevents efficient access to market information, increasing search and monitoring costs.

Crop-Specific Transaction Costs

Transaction costs also vary by product. High-value crops, which are often perishable (such as fish and vegetables), are typically associated with high transaction costs. On the one hand, these stem from transportation costs due to poor infrastructure such as rural roads and a lack of a cold chain. Such costs can be further exacerbated the higher the distance to markets. On the other hand, intangible transaction costs arise when an asset-specific investment has been made—such as a milk-cooling tank—or when the seller is facing a monopsonistic buying structure. That increases the risk of buyers behaving opportunistically and defaulting on the contract.

Household-Specific Factors That Influence Transaction Costs

There are a number of household-specific variables that are not so much transaction costs in themselves but have a significant impact on them, such as aversion to risk and uncertainty; social networks and organization; age, gender, and education; and intrahousehold interaction. Such variables all influence the costs of information seeking, negotiating, monitoring, and enforcement.

The prevalence of social networks and organizations may substantially reduce transaction costs. Often such networks ensure cooperation among farmers in the use of scarce and communal resources such as water. Moreover, small farmers may be better placed to understand their local environments in a way that ensures best use of existing resources in an environmentally sustainable way. The use of cooperatives or farmers' organizations to overcome marketing-related difficulties will be addressed in section 4.

Age, gender, and education can affect transaction costs in different ways. Age can often be indicative of farming experience, which makes certain informational and search costs easier and thus cheaper. Transaction costs related to accessing land and credit are much more variable for women

than for men. Education matters in terms of reducing the costs of searching for information. Moreover, the time taken to process and act on information decreases with education.

Internal transaction costs occur within the dynamics of intrahousehold interaction and can represent a constraint to the decision-making process in households. In some cases, that may reduce the incentive to enter competitive markets. Zaibet and Dunn (1998) argued that farm households may require a premium to overcome such costs, which is assumed to be proportionally related to the size of the household. Large or extended families may face higher negotiation.

Risk and uncertainty play a pivotal role in explaining the household decision to enter commercial markets. Participation in the market can reduce uncertainty as long as it is supported by better information, communication, and increased access to market outlets. On the other hand, uncertainty may be exacerbated by greater market participation as the security of subsistence is replaced by the insecurity of unstable markets and adverse price trends. Small farmers are unlikely to trade in the known set of risks associated with subsistence for an unknown set of risks that is a function of commercialization. Households will allocate their limited resources to subsistence and commercial production such that the disutility of risk is balanced against the utility of market goods (Von Braun, De Haen, and Blanken 1991). Hence, the case for the coexistence of various levels of market participation in a location in any given time period.

4. Overcoming Transaction Costs—the Role of the Private Sector

Because transaction costs vary over households and enterprises, commodities, and regions, there is no single innovation or intervention, public or private, that can reduce them. However, there are a number of ways in which market entry by small farmers can be developed. Those include contract farming, development of farmer organizations for marketing, development of the supply chain for high-value exports produced by smallholders through an appropriate mix of *private* and *public* sector initiatives, and facilitating private sector provision of market information via improved telecommunications (Kydd, Poulton et al. 2004). The role of government is crucial in specifying property rights and enforcing contracts in order to promote specialization and reduce the costs of market exchange (North 2000). Moreover, government policy needs to create incentives and send signals that encourage private sector participation in developing rural economies.

Vertical Coordination to Overcome Costs

The widespread proliferation of supermarkets in the developing world has been seen as an important feature of modern food systems. Their growth potentially enables many small farmers to bypass market failures and substantially reduce their transaction costs. Contractual arrangements with supermarkets can enhance farmer access to credit and finance, modern inputs, and technologies as well as access to managerial expertise. Reardon and Berdegúe (2002) and Reardon and Swinnen (2004) have shown the positive effects for small farmers of contractual arrangements with supermarkets in Latin America, Africa, and many transition economies.

The development of managerial and technical expertise, which is usually crop independent, gives farmers a comparative advantage in terms of moving across crops when market conditions change. Even when technological conditions change, such farmers are more likely to adapt because of lower transaction costs than farmers who are using technologies for the first time.

Though there are shown benefits to small farms that have managed to be included in these closely aligned food systems, it is perhaps too early to conclude whether supermarkets benefit small farmers over the long term or not. What is clear, however, is that in the heterogeneous cohort of small farmers, supermarkets tend to target those small farmers whose transaction costs are lower to begin with because of their asset base, human capital, and proximity to markets. Agribusiness, with its emphasis on quality and output, favors high-potential areas and large farmers precisely because of the need for consistency in supply and quality but equally because of the need to reduce transaction costs (Key and Runsten 1999). Evidence from elsewhere shows that contract farming in general

favors scale because of the administration costs associated with monitoring (Stanton 2000; Reardon and Barrett 2000).

Swinnen (2005) has provided some compelling evidence that contract farming has proved highly successful for small farmers in some transition economies where the prevailing production structure does not feature large farms. In the absence of choice, the critical issue is not simply that farmers will be able to enter markets but whether those farmers that are party to contracts are farmers whose initial endowments meant they faced lower transaction costs to begin with. Supermarkets pick winners.

Horizontal Coordination to Overcome Costs

For the outsiders the underlying market failures still remain, and their transaction costs can indeed become higher as seeking alternative contractual arrangements outside the system becomes even more costly than before. By its very nature, commercialization demands higher output and quality. The inverse relationship that can exist between scale and transaction costs makes for a powerful incentive for small farmers to coordinate their activities so that they can jointly benefit from reduced transaction costs that are at similar levels to larger production units.

Nevertheless, collaborative action brings with it a whole new set of transaction costs. It is likely that farmers associating will occur only if the benefits from collaboration cover the value of investment needed. Not enough is yet understood about the potential benefits and, particularly, costs. Benefits can be described in terms of increased productivity and increased negotiating power. More information is needed, however, to understand an actor's rationale for participating in producer groups. Better prices are often mentioned; nevertheless some argue that receiving a better price is not the main concern, having a secured market outlet and access to technical assistance and credit being more important (Swinnen 2005). On the potential costs even less is known. Successful association requires management and entrepreneurial skills—"soft" assets that many small producers with little education are less likely to have. Extension agents and nongovernmental organizations are working hard to build capacity in these areas, but no systematic information is available as to the impact of such trainings and the characteristics of farmers that benefit from them.

Examples abound of instances of farmer cooperation. In Andhra Pradesh the development of labor-water exchange allows marginal farmers to obtain irrigation water from neighboring farmers with tube wells and pay in labor services (Deshingkar et al. 2003). The availability of water has enabled year-round production of vegetables. Contract leasing has enabled small and marginal farmers to lease out their lands to outsiders who then supply the land with a tube well and grow a variety of crops ranging from carrots to chilies. The growth of village cooperatives in the dairy and poultry industries in Asia has pointed to a successful way of integrating landless, small, and marginal farmers into the changing food market.

In spite of these successes, we need to exercise some caution. Even where small farmers have coordinated their activities, the underlying trend is that as the process of commercialization advances, there is convergence toward large-scale production. The poultry industry in India started off with numerous small-scale units and was hailed as a victory for the small producer. Over time, the situation has become very different. The industry is now characterized by increasing average holding size (Pingali and Khwaja 2004). The pertinent issue is to understand which particular markets give small farmers a comparative advantage.³ Niche and organic markets may provide a solution for a few farmers, but many farmers are still likely to be excluded.

³ From case studies in Central America, one can deduct that subsectors that require large investments, such as beef and milk, seem to exclude small producers (Regoverning Markets project). On the other hand, labor-intensive production such as fresh fruits and vegetables seem to favor small farmer participation. This argument is based on the lower transaction costs involved in supervising family labor. One can question how this comparative advantage holds in areas where there is a shortage of labor.

Options and Concerns for the Private Sector

Thus, working together—both horizontally and vertically—can improve the stability of prices/returns, provide better financial returns, improve each actor's ability to supply what the market requires, and provide economies of scale and marketing support (Boehlje 1999; Van der Vorst 2005). Transaction costs diminish as partnerships and trust reduce the need for contracts and expensive negotiation. Vertical coordination contributes to a more efficient system, but two concerns warrant more careful examination.

First, as more efficient systems reduce the need for large numbers of suppliers, policies need to be put in place that facilitate the exit of the producers that will be left out of the system. It needs to be underlined that the issue is not the survival of small farms as such, but ensuring the livelihood and food security of people, including current small-scale producers. A major question is that of risk of exclusion of small farmers from the supply chain.

Second, despite having an economic rationale for working together, actors remain competitors. Point of departure should be to admit that productive units, both in agriculture and industry, pertaining to one of the links in the chain are, at the end of the day, looking for the highest returns (Roldán and Espinal 2000). Any marketing system represents a field of conflicting interests between the actors, and an efficient system necessarily needs to find the balance between the economic interests of each of the actors in the system.

Small farmers in that respect find a very skewed structure in the food system, facing on the one hand a small and reducing number of large food companies and food retailers. On the other hand, at the point of input supply to farmers, large chemical and seed companies are creating patented input supply systems controlled by a small number of companies (e.g., Monsanto and Dekalb Genetics Corporation/Delta and Pine Land, DuPont and Pioneer HiBred) (Napier 2001). Facing this structure, agricultural producers will find it increasingly difficult to negotiate favorable terms of the contract.

The most popular generalized formulas, such as associativity, are at best necessary but not sufficient. A generalized formula does and will not exist due to product- or chain-specific market requirements; therefore any option will need to consider a set of strategic actions and investments, differing by subsector, by the actors themselves in combination with public sector interventions. For example, studies done by Berdegué saw that in the milk products sector, at a minimum there is a need for heavy investments in cooling tanks. In the vegetable sector, there is a need for management of chain coordination, cold chain infrastructure, strategic market knowledge, and farm investments such as greenhouses.

5. Overcoming Transaction Costs—the Policy Focus

Whilst transaction costs are clearly important, a policy focus aimed at reducing the transaction costs of small farmers per se is difficult. Transaction costs tend to be highly context specific, and because they are not always separable from production costs, it makes identifying policy priorities difficult. The prevalence and level of individual farmer transaction costs is a function of *both* the food system itself and the stage of economic development that prevails in the agricultural/rural sector. Furthermore, transaction costs are very difficult to measure, making it difficult to understand precisely the sources of the costs and hence the corrective action required.

It makes more sense for the public sector emphasis to be on public good provision, generating market efficiencies and institutional reform to encourage private sector participation. It is the combination of both public and private action that enables farmers to enter competitive markets while also generating rural growth to stimulate nonfarm employment. Agricultural transition must be managed within a framework of rural development.

In this section we consider the type of public good provision and the institutional reform that are necessary precisely to create a more level playing field where many more small farmers are able to trade in competitive markets.

Public Good Provision

Policies aimed at the provision of better education, rural infrastructure, and communication have a number of benefits for small farm welfare. For those who can successfully remain in production there is a clear link between public good services and reduced transaction costs. In terms of facilitating exit strategies, public good provision is vital to reorient the rural economy toward alternative employment opportunities that support changing agricultural systems.

Education substantially reduces informational and search costs, but in a wider context education has to be seen as a fundamental policy priority. As commercialization proceeds, exits from small-scale agriculture are bound to occur. Education not only is necessary for the development of nonfarm sectors in the rural economy but is critical in facilitating labor movements across sectors.

Rural infrastructure investments play a crucial role in inducing farmers to move toward a commercial agricultural system. The emphasis for public investments should be on improving general transport, communications, and market infrastructure, while allowing the private sector to invest in commodity-specific processing, storage, and marketing facilities. Accessible and cost-effective communication systems such as mobile telephones can help generate information and other market-related services. The Internet explosion and related technologies have drastically reduced exchange and search costs in many Organisation for Economic Co-operation and Development countries and may be highly indicative of the benefits to developing countries (Bussolo and Whalley 2002).

Institutional Reform

While economic liberalization provides opportunities for diversification and commercialization, it requires farmers to be highly efficient in their use of water, land, and other resources in response to changing prices (Rosegrant, Schleyer, and Yadav 1995). Efficient land markets and secure property rights are essential to capture agricultural growth (Binswanger, Deininger, and Feder 1993). Where land rights are secure, farmers have the greater incentive needed to invest in land improvements. Secure land rights also make long-term investments more likely. Moreover, land ownership is an important source of collateral that can improve the credit status of farmers, leading to easier access to funding for inputs and so forth (Feder et al. 1988). Individual farmers and households need to be assured “stable engagement” with land and water resources, meaning land tenure and water use rights that are flexible enough to promote comparative advantage in food staples and cash crops. Those rights must be matched by access to rural credit and finance and the dissemination of technology and good practices in water use (DeHaen et al. 2003).

Government schemes to certify quality and safe food according to public regulations are required. This is important for domestic consumption and food safety, and even more so if a country wants to access foreign markets. If a country wants to export, it is necessary that an independent body will guarantee that the produce adheres to the required quality and safety standards. The Codex Alimentarius Commission, jointly serviced by the Food and Agriculture Organization and the World Health Organization (WHO), is charged with the responsibility of developing a food code. Its recommendations are based on the principle of sound scientific analysis and evidence, involving a thorough review of all relevant information. Codex international food standards are developed to protect the health of consumers and ensure fair practices in the food trade. The World Trade Organization’s Agreement on the Application of Sanitary and Phytosanitary Measures cites Codex standards, guidelines, and recommendations as the preferred international measures for facilitating international trade in food. The focus of the Codex is shifting to take account of the changing global food system.

Competition and trade policies need to address the constraints faced by small farmers. Often such policies favor scale because of the emphasis on growth. Incentives need to be placed where the costs of setting up agriculture-related businesses are reduced. Liberalization of domestic markets, through the removal of quantitative restrictions on trade and the opening up of economies to internal trade opportunities, is often a key step in starting or accelerating the process of commercialization. However, the opening up of markets also exposes producers to increased risk given the greater volatility of world prices. Governments have historically intervened heavily in domestic markets to protect and stabilize the prices of agricultural commodities, with the result that domestic producer prices have varied substantially less than international prices. The relationship between diversification and risk is thus crucial in the context of trade and macroeconomic reform designed to align domestic prices more closely with international prices.

Many low-volume markets are associated with high price volatility. Moreover, the diversification “start-up” phenomenon, of high prices for several seasons leading to oversupply and a consequent collapse of prices, is all too common. This can be countered by measures to expand the market by lowering transaction costs, improving external linkages, or providing storage and processing technologies. Effective rural financial institutions will also assist in risk spreading and in the sharing of the benefits of commercialization more widely across the community and region.

6. Conclusion

The transition process is painful. Before we target transaction costs in an effort to increase small farmer participation we need to bear in mind two points. First, while reducing transaction costs should in principle allow for a greater number of farmers to trade, the ability to enter is not the same as the ability to stay. That is as much a function of other factors as it is of transaction costs. Therefore, interventions need to be cost effective. Public money should not be spent in declining and noncompetitive sectors. Second, transaction costs are household, commodity, and location specific and are subject to constant change. Interventions aimed at targeted reductions in specific costs should not be in the public domain. Public sector interventions are best left for public good provision and institutional reforms to correct incomplete or absent markets. The reduction of transaction costs associated with the specificities of the food system is best left in the hands of the private sector.

To better target interventions and take corrective action, a holistic view is required that analyzes the relationships between agricultural commercialization, chain efficiency, and small farmers. Transaction costs have been shown to play a key role in this, but our understanding is still insufficient, both in terms of analyzing their relationship with production costs and in terms of whether they can be reduced over time. It is combinations of transaction costs that determine market entry, and very often the sources of transaction costs are not separable, which makes targeting policy difficult. Because of measurement problems, we do not yet know how to address the issues. Some critical issues that require further research include the following:

- Emphasize the heterogeneous nature of the small farmer.
- Identify who wins and who loses and what can be done to reduce the transitional costs of the losers.
- Take a broader look at the whole value chain. How are contractual arrangements determined? What and where are the bottlenecks that ultimately have an impact on small farmers?
- Identify more specific policy recommendations beyond the generalized interventions listed above. This requires more context-specific research. Try to bring lessons learned from these specifics back up to the more generic.

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Discussant Remarks

David King, Secretary General, International Federation of Agricultural Producers (IFAP), France

The future of small farms depends very much on your objective. If your objective for agriculture is to create huge export earnings as the Brazilians do, then there is very little place for small farmers. Now, if your objective for agriculture is to meet the Millennium Development Goals (MDGs), then you have to support small farmers. There is no way to reach the MDGs and eliminate poverty and hunger in the world if a large part of the rural population is neglected or displaced. This is a critical issue of particular relevance in the context of the MDG “lack of progress” report. Why is agriculture not a priority on the agendas of national governments and international institutions? It is because there is no strong enough farmers’ voice to stand up and say, “Agriculture should be a priority.” So my first conclusion is that research has to be directed to making small-scale farming profitable, and not to transform it into large-scale farming or into off-farm work.

Small-scale farmers are not a homogenous group. There are several groups of small-scale farmers. There is one group that essentially is not even farmers—these are people that go to the forest or up in the hills, cultivate a few crops and try to stay alive. They are not farmers in the professional sense. For this group, there has to be a clear rural employment policy to find them opportunities to exit agriculture.

So we have to identify who the small farmers really are and look at the people who have very, small land parcels in very difficult agro-ecological areas and try and help them with alternatives. Then there is the group of farmers that will make it. This is Tom Reardon’s top third. They’ll make it, and they have to be supported with the right technology. They need adapted technology, such as fertilizer in small bags, better inputs, all the things they don’t have today—even also the chance to enter the commercial markets, - and that is where the focus of research effort needs to be. Right now, very few people care about them, and national governments don’t seem to care at all. To facilitate them moving forward, we need research done on appropriate public support systems for extension, credit, market regulation against unfair competition, and encouraging farmers to organize themselves.

Now, to come to the papers, essentially the two presenters have drawn very much on work about accessing supermarket chains by small farmers and how they get their products on the shelf—and especially how you reduce transaction costs to give them more of a chance. I find the two papers very interesting. Tom’s scenario is actually very scary. The imbalance in market power of the actors, when you just have a few companies like Wal-Mart is dominating the international food system, is a real problem. One of Tom’s key points is that the small farmers who will survive—if we just let this rule of the jungle continue—are the capitalized ones. Therefore I propose that we put some effort into researching this issue. How do you capitalize the small farmers so that more of them will survive? Let’s look at financing agriculture for small farmers.

Prabhu Pingali goes very much into the public interest side of this debate—to say, well, if we don’t like this neglect of small farmers, what can we do about it? And he says we can research several things, one of which is: provision of public goods such as better education, infrastructure, communications, and things such as that. Another thing is safety nets. I don’t think we talked enough about safety nets. Our keynote speaker yesterday said that one of the key problems for that lead farmers into poverty is that they get sick. But it is more than that. Poverty is caused by inability to cope with any sort of shock—a harvest failure, a crisis in the family. If such a thing happened in Australia, for example — which it has — nobody there would die from it or lose everything. Why not? Because they have insurance, and they have public safety net provisions. Too often, development institutions refuse to look at what instruments exist and work well in the industrialized countries. Crop insurance is deemed to be ‘bad’ because it is subsidized in industrialized countries. So safety nets are something we have to look at more closely because they are probably what are needed to keep farmers out of poverty when things go wrong.

With regard to institutional reform, I agree with Dr. Pingali very much that we need property rights. The first thing small farmers need is secure access to land. They’re not going to invest in their land and be proper farmers unless they have security of tenure, as well as secure access to other basic resources such as water, credit and appropriate technology. I also agree with Dr. Pingali on the

need for a better regulatory environment. Expanding competition policy and controlling abusive market behavior in the food distribution chain are crucial. You know, organizations like WTO, World Bank etc. are very good at looking at distortions created by the public sector and at recommending getting rid of subsidies. But who's looking at distortions caused by private sector companies? When it comes to liberalization, if you are liberalizing a very imperfect, uncompetitive market, you are just creating a lot of rich people and even more poor people.

Mr. Pingali also notes the need for farmers to cooperate and be organized. Farmers need to organize themselves in the market. I think we also need to talk about farmers organizing to provide services when government is not doing it, such as extension services. If farmers' organizations provide services to members, they'll get people to join up and to start building effective organizations. And of course farmers also need to be strong so they can express their views for lobbying and negotiating with government.

Continuing the status quo means that we are unlikely to achieve the MDGs; we have to focus on the small farm sector to achieve those goals. And remember they need to have a voice through their farmers' organizations so they can make of their full contribution to the development process.

Discussant Remarks

Alejandro Schejtman, Senior Research Fellow, Latin American Center for Rural Development (RIMISP), Chile

The various varieties of contract agriculture, together with more informal agreements between small producers and agro-industries of different sizes and organizational structures, are not a new phenomenon, although they have generally arisen without the existence of any policy designed to stimulate their development and regulate the relations between the agents concerned. This experience has given rise to advantages and problems for both sides, as described below.

Advantages for the Agro-industry

The main advantages for the agro-industry are as follows:

1. Transfer of the risks inherent in agricultural production to third parties.
2. Avoidance of problems deriving from wage relations.
3. Avoidance of the risk of giving grounds for expropriation under agrarian reform legislation.
4. Avoidance of locking up capital in land.
5. Procurement of access to land suitable for growing the inputs required by the agro-industry in areas where that is possible only through agreements with producers in general and small producers in particular, if the latter predominate in such areas.
6. Reduction of costs when own-account production would be more costly, by making use of small producers when large agricultural enterprises ask higher prices, even though the transaction costs involved may be higher.
7. Compliance with public incentives or legislation that respectively encourage or oblige the purchase of inputs from small producers.

Risks for the Agro-industry

Among the most important risks for the agro-industry are these:

1. Increased transaction costs as the number of suppliers rises (in respect of transport, technical assistance, quality control, administration, etc.).
2. More complex contracts, which, in order to ensure efficiency, must include a number of variables (quality, timeliness, price) that are hard to regulate and can lead to continual disputes.
3. The risk that contract farmers may sell their goods to third parties when the price contracted with the agro-industry is lower than the price on the market at the time of delivery.
4. The possibility that inputs supplied by the agro-industry may be diverted to other uses than those agreed upon.

Advantages for the Small Producer

Among the advantages for the small producer are these:

1. A guaranteed market and, if stipulated in the contract, a predetermined price.
2. Technical assistance, which makes it possible to raise the yield per hectare.
3. Incorporation of products of higher value.
4. Fuller use of family labor, since the products concerned are generally those involving more intensive use of labor.
5. The possibility of using the new knowledge on traditional crops or crops not covered by the agreement.
6. In some cases, access to means of production (machinery or equipment) belonging to the agro-industry.

Risks for the Small Producer

Generally speaking, most of the risks assumed by the small producer stem from the agro-industry's possibility of manipulating the terms of the agreements, either because the suppliers do not fully understand them or because the agreements are sufficiently ambiguous to allow of interpretations, which, depending on the relative bargaining power, may be used to the agro-industry's advantage.

The most frequent drawbacks are these:

1. Manipulation of quality standards in order to regulate prices and deliveries.
2. Late reception of products in order to reduce the price.
3. Tying one contract to another, which is less advantageous to the producer, when the agro-industry acquires more than one product.
4. Encouragement of concentration on a single crop, with the corresponding dependence and vulnerability.
5. Shortcomings in the technical assistance provided, whose ill effects become the responsibility of the producer rather than of the supplying enterprise.
6. Delays in payment or unclear settlements of amounts due.
7. Favoritism in the allocation of the most favorable sowing dates.

The agro-industry's manipulation capacity is all the greater when it is in a monopoly position, when it is itself a major supplier of the agricultural input needed, when the producers grow only that one input and it has a relatively long growth cycle, and when they have debts with the agro-industry.

Session 2

Summary of the Open Discussion

The discussion highlighted a number of issues dealing with the extent and effect of market integration and the policy steps to address such changes. One participant encouraged the group to keep in mind that not only the small farmers themselves but also small processors further down the chain are affected by the new market dynamics. In addition, policy recommendations should recognize that many small farms and businesses are run by women. Another wondered whether it is fair to assume that the market transformations described during the paper presentations and the accompanying marginalization of smallholders will emerge only once there is sufficient growth in the nonfarm sector that increases incomes, stimulates consumer demand, and entices supermarkets to invest into a particular country. That point was echoed by yet another, who suggested that proliferation of supermarkets occurs only under certain conditions, but typically under those same conditions small farmers are better equipped to adjust to changes.

Turning to solutions for easing market transitions, a range of policies was advocated, including greater horizontal and vertical coordination, reduction of transaction costs, and strengthening wholesale markets. One participant noted that it is important to distinguish between the small farmers and the small farms in devising strategies and refrain from using the two concepts interchangeably, given that the former can have a variety of coping and exit strategies while the latter are physical entities with little flexibility. Another argued that small farmers, rather than farms, should be the focus of policymakers' efforts in Africa, and especially the issue of their limited capacity to endure major market transformations.

To strengthen the bargaining position of small farmers, various participants advocated promoting farmer organizations and cooperatives, as well as exploring contract farming arrangements as a way to reduce transaction costs and engage smallholders in markets. It was noted that models of farmer cooperation should be added to the research agenda, since small farmers often do not know how to organize themselves. In addition, the possibility of taking proactive policy steps to facilitate transition to integrating markets was discussed. Given that integration processes occur with different speed for different commodities (rapidly for staples and more slowly for fresh fruit and vegetables), one of the participants argued that policymakers should pick the battles that can be won. He thus noted that promoting public sector investment, upgrading production, and creating functioning wholesale markets could help ensure equity and long-term competitiveness in at least some subsectors of agriculture.

Session 3
Smallholder Farming in Difficult Circumstances

Smallholder Farming in Less-Favored Areas: Options for Pro-Poor and Sustainable Livelihoods*

Ruerd Ruben, Associate Professor, Development Economics Group, Wageningen Agricultural University, Netherlands, and program leader of the Wageningen-IFPRI collaborative research program on development strategies for less-favored areas

1. Introduction

Smallholder farming in less-favored areas (LFAs) is simultaneously constrained by agro-ecological, economic, and institutional factors that keep households “trapped” in vicious circles of chronic poverty and resource degradation. Common strategies to address rural poverty by increasing returns to agricultural production are likely to fail, since the opportunities for investments in improved resource management regimes are severely limited due to strong input complementarities and high transaction costs. Therefore, poverty reduction in LFAs can be achieved only through an integrated strategy that focuses on the right mixture and sequence of interventions that systematically address the most-limiting factors that constrain access and returns to physical, human, financial, and social capital (de Janvry and Sadoulet 2005).

Less-favored areas are usually defined as remote regions with a fragile natural resource base (compared to population density) where poor market linkages and institutional failures lead to low margins and reduce the effectiveness of agricultural development policy. Under such conditions, rural households organize their livelihoods through selective engagement in a wide number of (non)agricultural activities in order to cope with uncertainties and to diversify risk. Consequently, most of the poverty in LFAs can be characterized as “asset poverty” (i.e., low and uncertain returns to resources). This makes households extremely vulnerable to shocks and can easily lead to an irreversible breakdown of their asset base (Barrett and Carter 2005).

Production systems and livelihood strategies of smallholders living in the LFAs are highly diversified, based on the combination of different cropping, livestock, and nonfarm activities, and rely on strong interactions among agricultural activities (e.g., crop residue recycling, animal traction for land preparation, manure deposition). Resource use strategies need to make optimal use of the spatial heterogeneity amongst farmers and fields. In most highland areas in eastern Africa and Southeast Asia, rural households suffer from low land and labor productivity, while investment barriers inhibit the take-off toward a process of sustainable agricultural intensification (Pender 2004). In the dryland areas of Sub-Saharan Africa, this process is further constrained by the strong variability in rainfall conditions that ask for highly adaptive farming strategies (Dietz, Ruben, and Verhagen 2004). In both settings, local nonmarket arrangements play an important role in overcoming temporal resource constraints. The most important structural features that characterize smallholder livelihoods in LFAs can be summarized as follows (Ruben and Pender 2004):

- Relatively “simple” production technologies making intensive use of locally available production factors
- Strong local interactions between farm households based on exchange of inputs, labor, and consumptive commodities
- Limited savings (mainly for consumption smoothing) and low fixed investments due to high risk and binding cash or credit constraints
- Large price bands between farm-gate and market prices and entry barriers caused by high transaction costs that reduce the tradability of agricultural commodities

In addition to the general constraints to agricultural and rural development, communities located in LFAs are characterized by a particular social structure with a strong heterogeneity in farm

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household resource endowments, ranging from nearly landless workers to better-equipped farmers (Hazell et al. 2005; Jayne et al. 2003). Household-specific transaction costs limit access to input and output markets, while institutional arrangements may lead to a differential access to common property resources (pasture and forestry areas). This implies that rural households face multiple constraints for contributing to resource conservation activities at farm and village level.

Box 1. Poor people or poor areas?

The identification of particular geographic areas for targeting development efforts is based on the assumption that location is a prime determinant for poverty. Where large inequalities in living standards and poverty incidence are registered between different geographic settings, focusing attention on such “backward” (or “less-favored”) areas can substantially improve targeting efficiency (Bigman and Fofack 2000).

Less-favored areas can be defined according to place and space characteristics. *Place* refers to climate and soil conditions that limit returns to agricultural production and make yields highly uncertain, especially under conditions of high population density. *Space* refers mainly to distance to markets and services, occasioning high transaction costs. In both settings, barriers to migration—either because moving is costly and risky or because people cannot move due to local patronage systems—could easily lead to spatial poverty traps. Thin land markets and barriers to borrowing further reduce the prospects for escaping from poverty.

Empirical evidence derived from several studies on geographical poverty traps indicates that geographic factors (residence) have a strong and significant effect on household wealth and consumption (Ravallion and Jalan 1996; Minot 2000). Initial poverty conditions in LFAs consistently reduce returns to private investment, and the low stock of community capital has a strong negative effect on the productivity of private investment. In addition, health conditions in LFAs are usually worse and educational levels are limited, thus further reducing the returns to labor. These results suggest that households living in poor (mainly rural) areas face critical geographical constraints and meet consumption levels that are substantially lower than otherwise identical households living in better areas.

Whereas broad spatial targeting based on access and distance (road density) criteria can be effective for reducing poverty due to adverse (manmade and natural) geographic variables, differences in the distribution of private assets may negatively affect income distribution (Escobal 2005). Therefore, complementarities between social and physical infrastructure and the role of local institutions need to be seriously considered. Other studies suggest that substantial disaggregation is required and that attention should be focused on relatively small administrative units (districts, villages), since a large part of the variation in household income can be attributed to within-village differences in resource endowments (Jayne et al. 2003; Elbers et al. 2004; Baker and Grosch 1994).

Within the framework of livelihood studies, growing attention is given to social heterogeneity and the identification of “people at risk”. Vulnerable population groups are identified according to criteria of gender, age, ethnicity, household size, and education. It has been noted, however, that most of these individual characteristics tend to be geographically correlated, since disadvantaged groups are likely to be concentrated in remote and less productive areas (van de Walle and Gunewardena 2001). Given equal endowments and location, disadvantaged and minority groups still receive lower returns to given individual and household characteristics. Lower returns may, however, be contested by behavioral responses that partly compensate for the geographic disadvantages. Otherwise, households’ risk-coping strategies may inhibit people from taking advantage of available options (Dercon 2005).

Even when the absolute advantage of poor areas is limited, a wide diversity of development pathways can be identified based on specific local and individual relative advantages (Pender 2004). Geographic focus does therefore not imply that one-size-fits-all incentives are sufficient. The exploitation of the existing diversity through a combination of public investment (for reducing access constraints) and local incentives (enabling people to take up sustainable livelihoods) can be considered a useful middle ground between spatial targeting and reaching vulnerable people.

Family farms represent the overwhelming majority of farm households in LFAs, even if farm sizes still differ. Major differences between farmers' incomes are related to asset ownership (particularly oxen for land preparation; see Holden, Shiferaw, and Pender 2004), education (related to engagement in nonfarm activities), and, to a minor extent, access to water (for supplementary irrigation). Location (distance to roads and services), biophysical conditions (soil quality and rainfall), and population density are key determinants of available land use options (see Box 1). Different development pathways and livelihood strategies are therefore to a large degree "shaped" by the absolute comparative (dis)advantage of LFAs, whereas differentiation between farming systems can be largely attributed to variability in selected farming practices (Jansen, Siegel, and Pichon 2005; Pender 2004).

Given the variability of LFAs in terms of their agricultural potential (soil fertility and rainfall) and access (remoteness), different types of development options can be identified to address poverty and resource degradation. Instead of focusing only on resource use intensification, reinforcement of smallholder farming in LFAs asks for simultaneous efforts in the direction of production systems integration, searching for input complementarities, activity diversification, and selective market integration. In the remainder of this paper, we discuss the pros and cons of different development pathways available for smallholder development in LFAs. To that effect, we explore three different strategies:

- a. Agricultural-based pathways that focus on investment in land resources for improving the productivity and sustainability of the natural resource base
- b. Employment-based pathways that intend to improve the returns to family labor through diversification of activities
- c. Institutions-based pathways that focus on the reduction of risk and transaction costs for improving the certainty of returns to investments

In many situations, a combination of these three pathways will be pursued, since rural poverty in LFAs is generally caused by heterogeneous constraints that can be addressed only through careful management of the existing window of opportunities.

2. Resource Base and Agricultural Potential

Agricultural production in LFAs suffers from low and variable returns, and escaping from poverty is difficult because of critical resource thresholds. Crop yields in dryland and highland areas are mostly limited because of nutrient or water constraints (IAC 2004), whereas uncertainties regarding rainfall affect timely applications of external inputs. Given the inherent characteristics of the natural resource base (i.e., low soil organic matter content and limited water retention capacity), the effective uptake of water and nutrients is severely reduced. Consequently, investments for improving the quality of natural capital are required before any increases in factor returns can be expected.

Different options are available to enhance the productivity of land resources. First, we focus on strategies for overcoming binding resource thresholds, making use of the most-limiting-factor approach. Second, we discuss the opportunities for increasing resource productivity through internally available or externally purchased inputs. Special attention is given to the limited possibilities for factor substitution and the requirements for input complementarities. Third, we identify how smallholders in LFAs can take advantage of the existing heterogeneity in resources for the establishment of synergies within highly integrated mixed farming systems.

Actual and Potential Production

Whether and how environmental factors limit an increase in agricultural production can be determined through an analysis that compares the production potential of natural ecosystems with actual production levels, followed by an appraisal of the causes of the differences between actual and potential production. Agro-ecological approaches are widely used to assess the biophysical determinants of potential yield levels without impairing the carrying capacity of the natural resource

base. Farming systems research provides insights into factors that determine actual production and identifies socioeconomic constraints to further intensification.

Soil and climate conditions in the Sub-Saharan region are frequently used as an illustration for the existing yield gaps in arable cropping and livestock production (van Keulen and Breman 1990; Breman 1997). On average, yields, expressed in grain equivalents, could increase by 3–5 tons per hectare in semiarid regions growing one crop per year and by 13–17 tons per hectare in humid regions with two to three crops annually if best technical means are used to eliminate the yield-limiting and -reducing factors. Potential yields for many crops are at least five to 10 times higher than actual yields (see Box 2). Fertilizers can also increase rangeland production from 1.5–3 tons per hectare to 4–12 tons per hectare and increase protein content of fodder from 4 to 12 percent (Breman 1995).

Detailed analyses of the causes of these yield gaps indicate that even in the semiarid Sahel region water is usually not the major limiting factor (de Wit 1992; Bindraban et al. 1999).¹ Poor soil fertility—nitrogen and phosphorus shortfalls at critical moments in the growing season—limits growth rates and yields. Numerous field experiments have confirmed this key limitation (Breman, Groot, and van Keulen 2001). Given the high fixed investment for irrigation and the fact that water is not a tradable good, the identification of (micro- and macro-) nutrients as a key limiting factor offers opportunities for local strategies toward resource intensification.

Analyses of available technical options for improving land productivity in LFAs reveal a number of critical constraints to farming systems intensification (IAC 2004):

- The vast majority of farming systems in African LFAs is rainfed and will continue to take place under natural and irregular rainfall conditions. Possibilities for full and supplementary irrigation are limited to humid areas, since alluvial soils conducive for effective irrigation are scarce in Africa.
- In most settings (except in extremely arid regions and shallow hillsides) the scarce availability of nutrients is a key limitation for increasing yields. The extremely low application rate (on average 14 kilograms per hectare in Africa compared with 90 kilograms per hectare in Southeast Asia and 60 kilograms per hectare in Latin America) is mainly related to risk and highly unfavorable product value–input cost ratios (Heerink 2005).
- Water scarcity, especially in semiarid areas, can be addressed by more water-efficient management systems; there is considerable potential for capturing rainfall through improved soil surface management, water-harvesting systems and small-scale irrigation. Water management is of key importance to reduce variability in yields and to enable farmers to select optimal sowing dates (Hengsdijk and van Keulen 2002).
- Soil fertility depletion is a major cause of low per capita food production; African smallholders remove yearly large quantities of nutrients from the soils without applying sufficient amounts of fertilizers or manure. The annual loss due to soil depletion is equivalent to US\$4 billion (roughly 30 to 40 percent of farm household income in Sub-Saharan Africa; see IAC 2004).

Given the general scarcity of resources in LFAs, improvement of input efficiency is considered more important than higher input availability. Moreover, in areas with variable climatic conditions, optimal yield distribution receives more priority than the improvement of average yield levels. Therefore, options for enhancing complementarities between resources and for maintaining flexibility in resource allocation are considered as risk-reducing devices (Fafchamps 1993; van Noordwijk, Dijksterhuis, and van Keulen 1994). Maintaining a meaningful *diversity* in cropping systems and searching for *combinations of activities* with low covariance is the most common risk mitigation strategy.

¹ At less than 200 to 250 millimeters of annual infiltration (common for the northern Sahel), water remains the limiting factor, but only further south, in places with strong runoff or shallow soils, is water availability the critical constraint (Breman 1995). Moisture stress is also likely to appear in arid regions where compact soils and scarce herb layers limit water retention.

Box 2. Yield Gaps in Africa

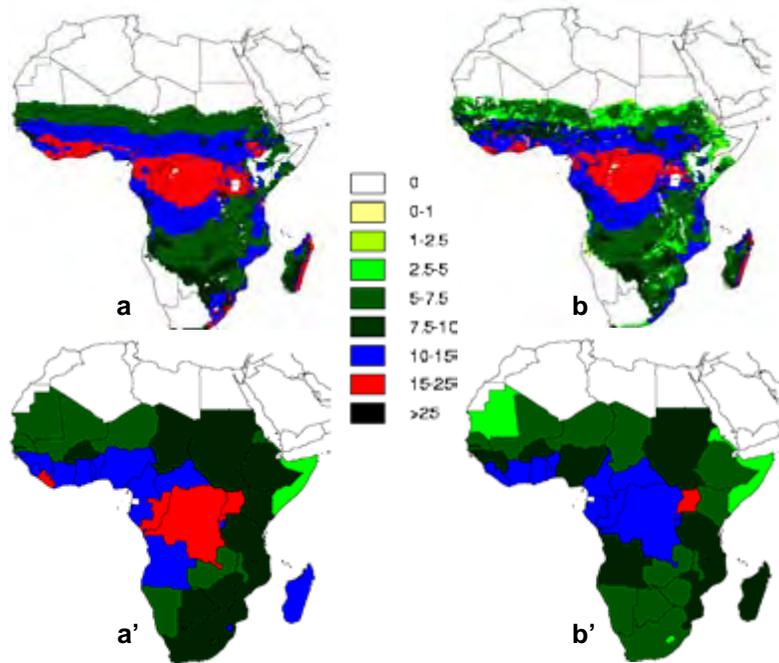


Figure 1. Calculated potential (a) and water-limited (b) yields (tons/hectare). The upper maps represent the estimations per grid cell of 5 x 5 grades. Below are the weighted averages per country for agricultural land area (a' and b').

To create an overall view of the yield gap for Sub-Saharan Africa, Bindraban et al. (1999) calculated production levels of a “generic” cereal crop as a proxy for a wide range of crops that could be grown, with yields expressed in grain equivalents. The yield gaps obtained are indicative for the yields that can be reached under different levels of production.

Calculated yields at a resolution of 5 x 5 grades refer to annual yields that can be obtained from one to three crops a year. With actual yield data available at the country levels only, calculated yields were aggregated to national scales. The analysis revealed large yield gaps, suggesting great potential for increasing the production of crops resembling cereals.

This yield gap analysis could be expanded with the assessment of inputs required to realize the yield increase. The analysis reveals only the potentials that are feasible in ecological terms.

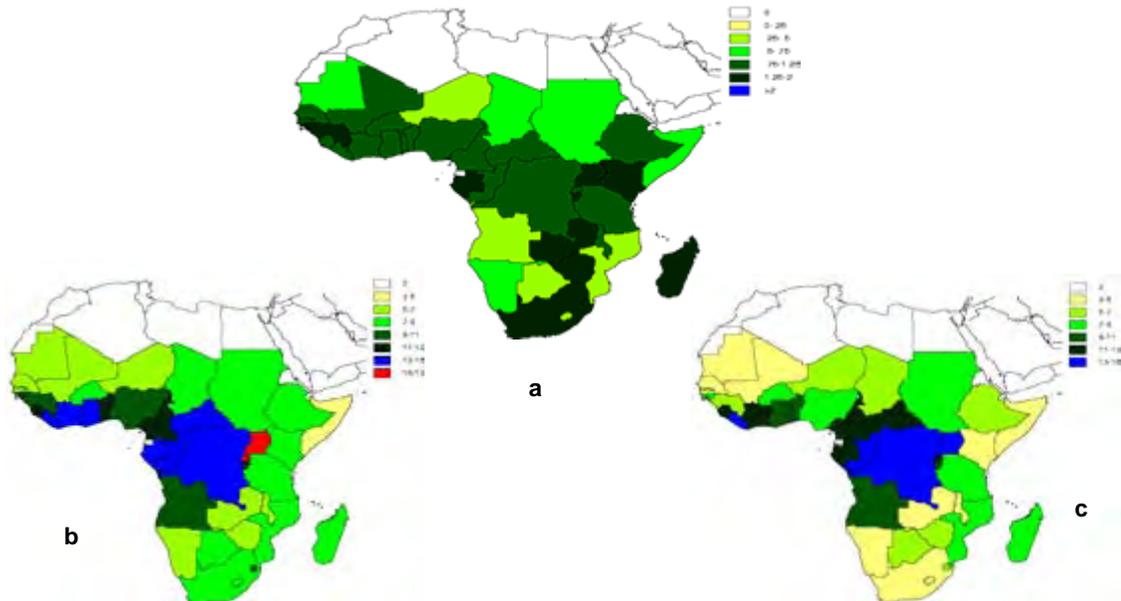


Figure 2. Actual average cereal yield (a, per Food and Agriculture Organization), potential yield gap (b), and water yield gap (c) (in tons/hectare).

Note: Scaling varies for various maps.

Source: Bindraban et al. (1999).

Reliance on Internal or External Inputs

Resource productivity can be improved through application of external inputs or with internal resources. Given the high costs of agrochemical inputs, poor farmers tend to rely on internal inputs (manure, fallow, cover crops). Economic performance of such low external input systems has been disappointing due to their generally high labor requirements (Ruben and Lee 2000; Low 1994). Only in rather remote regions with high population density and low opportunity costs of labor, exclusive reliance on internal inputs may be a feasible option. In other settings, a combination of internal and external inputs will be more appropriate for raising factor productivity.

Agricultural research systems for Africa have produced technologies that are inappropriate to the factor endowments of most LFA smallholders. Often there has been too much emphasis on increasing land productivity and not enough on the need for sustainability, stability (reduction of annual fluctuations in output), and multiple outputs (crop diversification in order to reduce income risks). Most often neglected is the potential effect of recommended technologies for labor productivity (Spencer, Matlon, and Löffler 2004).

Spencer and Byerlee (1976) showed that although Asia-like rice systems in Sierra Leone increased yields under small farm conditions by more than 150 percent, returns to labor increased by less than 70 percent. Similarly, Ehui, Kang, and Spencer (1990) demonstrate that improved land management systems such as alley cropping, which are designed to reduce soil erosion and increase yields, are profitable only where population density is high and labor costs are low. This has been confirmed more recently by Sanchez (2002), acknowledging that although improved tree fallows technically perform well, they are not attractive to smallholders in the margins of the humid tropical forests who have better land use alternatives that require less labor (Kwesiga et al. 2002; Franzel 1999).

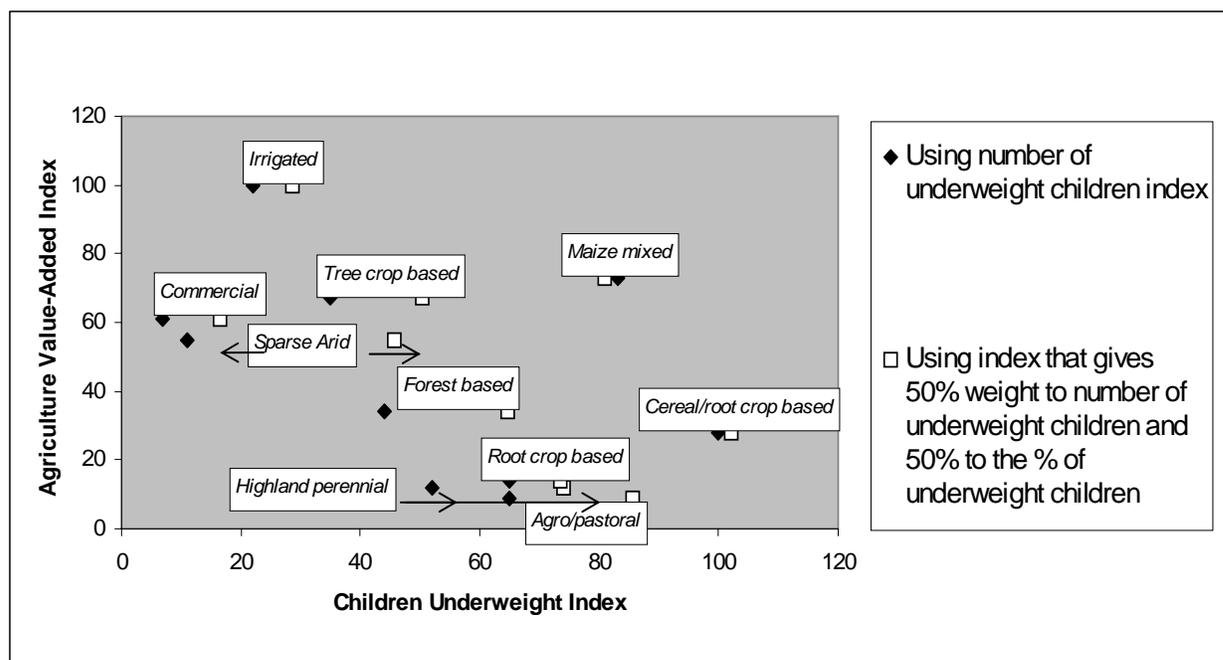
Disaggregated analyses of production functions that distinguish between internal and external inputs indicate that only at very low input levels does the internal input system perform relatively well, but it requires far more labor use, while higher yields become attainable only when inorganic fertilizers are used that permit more effective and timely nutrient uptake. External inputs thus increase the yield plateau of the production functions since input complementarities are better guaranteed (Ruben and Heerink 1995). This can be further reinforced through soil and water conservation measures that improve soil organic matter content and water retention capacity, and thus improve fertilizer uptake (Kuyvenhoven and Ruben 2000). LFA smallholders are likely to prefer external inputs that can improve both land and labor productivity.

Heterogeneous Resources and Mixed Systems

Farming systems in LFAs can be assessed in terms of their demographic importance, prevalence of poverty, and growth potential (Dixon, Gulliver, and Gibbon 2001). Given their promise for reducing poverty and realizing agricultural growth, five key farming systems are indicated for further analysis: maize mixed, tree crop, irrigated farming, cereal-root crop mixed, and agropastoral millet/sorghum systems.

Spencer, Matlon, and Löffler (2004) compare major African farming systems according to agricultural value-added and a composite index of the number and percentage of underweight children (see Figure 3). Farming systems in the right and upper parts of the graph deserve priority attention for food-security and poverty reduction

Figure 3. Malnutrition and Agricultural Production Value Indices for Major Farming Systems in Africa



Source: World Development Indicators 2003 (data on agricultural value-added) and Center for International Earth Science Information Network, 2003 (malnutrition data).

Major emphasis needs to be given to LFAs where mixed systems based on maize, cereal and root crops, agropastoral production, and highland perennial crops represent key production activities. Synergies in resource flows within these systems represent an important dimension of their comparative advantage. Advances in erosion control have made hillside farming more profitable and less destructive. Crop-livestock interactions proved to be helpful to increase productivity. There is increasing evidence that in fragile environments, integrated systems outperform more specialized systems in terms of nutrient recycling, water use efficiency, and returns to land and labor (Mkamilo 2004).

Variability within and between farms is now generally understood as an inherent characteristic of LFA livelihoods, and resource management options for farming systems intensification appear to be highly related to the interactions between land management and cropping strategies (Tittonell et al. 2005; Crowley and Carter 2000; Tengberg et al. 1998). In areas of high population density, the proximity to markets and access to off-farm employment can be driving forces for resource use intensification, whereas in more sparsely populated and remote areas farmers' capacities for managing spatial and temporal variability determine input use decisions.

Intensification and Integration

In most LFAs, given the limited natural resource potential, overpopulation is already reached at relatively low population densities. Whereas depletion of soil fertility is recognized as a major biophysical cause of stagnating per capita food production—as confirmed by the large negative soil nutrient balances in all of Sub-Saharan Africa (Stoorvogel and Smaling 1990)—two different strategies are available for improving farming systems performance: intensification and integrated agriculture.

Strategies toward agricultural intensification are based on public and private investments for nutrient replenishment that encourage smallholders to improve input use in cropping and livestock activities. Ruben et al. (1996) show for southern Mali that such investments will be profitable only

when adequate road infrastructure is in place that ensures higher farm-gate prices and reduced price variability.² Other critical policy conditions to enhance farmers' supply response refer to exchange rate adjustments and occasional reliance on selective input subsidies.

Prospects for integrated agriculture are widely explored (see Hazell et al. 2005 and Reij and Steeds 2003 for useful overviews) and usually rely on a combination of strategies for increasing nutrient availability (e.g., manure, legumes, agroforestry) and for reducing nutrient and water losses (erosion control, water harvesting, pest management, adapted varieties). For the development of such integrated systems, technical assistance and credit provision are considered of vital importance, and local institutions that enable collective action and guarantee property rights should be in place. Given the considerable time lags for reaping the benefits as well as the externalities involved, the range of technological options available for the integration of LFA farming systems puts a high demand on local participation and community organization (Knox, Meinzen-Dick, and Hazell 2002; McCarthy et al. 2004).

Summarizing, we may conclude that the agricultural potential for smallholder production in LFAs is severely limited, but certainly not fully exploited. Available margins for improving resource use efficiency through input intensification and production systems diversification can be unlocked through a careful combination of public and private investments that focus on truly complementary external input provision and address critical resource use and timing constraints.

3. Population and Livelihood Strategies

Even while agricultural production is still considered an important foundation for smallholders' livelihoods in LFAs, the vulnerability of the natural resource base and the emerging demographic dynamics require a broader analysis, including a number of alternative livelihood options. Since poverty is intimately related to the entitlements to assets and the returns to land and labor, LFA livelihood strategies are likely to be structured around a diversified portfolio of activities and resources in order to ensure food security or to improve the standard of living (Ellis 2000).

The analysis of livelihood dynamics in LFAs involves both internal and external dimensions and covers a whole range of socioeconomic, cultural, and institutional issues. First, we review the literature on the role of off- and nonfarm employment and migration for diversification of smallholder livelihoods in LFAs and derive some implication for poverty alleviation and income distribution. Second, we analyze the evolution of demographic trends that are typical for LFA smallholders and indicate the effects of HIV/AIDS for the reorganization of production systems, family relations, governance structures, and social networks. Finally, attention is given to the effects of health and education on the quality of the labor force and the possibilities for reducing poverty and increasing returns to labor through better social services.

Diversification into Nonfarm Activities

Rural households are increasingly engaged in off-farm wage employment and nonfarm wage- and self-employment activities. Estimates of the share of total nonfarm income in household income range from 25 to 45 percent in Sub-Saharan Africa to more than 60 percent in Latin America and Southeast Asia (Reardon, Berdegúe, and Escobar 2001; Barrett, Reardon, and Webb 2001). Nonfarm income in LFAs is mainly derived from three sources: local small-scale and low-return self-employment activities, remittances from migration, and to a minor extent income from rural wage employment. The former activities are especially undertaken by better-off households and the derived revenue streams thus tend to reinforce income inequality. While some studies refer to entry barriers as the main cause, more detailed assessments of the capital and education requirements for supplementary activities in rural Burkina Faso indicate that those tend to be fairly limited (Brons 2005).

Income diversification provides in principle an important pathway out of poverty, especially when the derived income streams are less covariant with agricultural output and thus contribute to reducing vulnerability. However, when smallholders face different types of asset and market

² A value-cost ratio larger than 2 is usually considered a minimum requirement for sustained adoption of chemical fertilizer technologies.

constraints, a heterogeneous pattern of engagement in nonfarm activities can be expected (Barrett et al. 2004). In LFAs, existing options for income diversification available to poorer households tend to be rather restricted mainly due to demand-side constraints. Much of the income diversification is therefore typically “desperation led” and confined to activities that require limited and unskilled labor (Barrett, Reardon, and Webb 2001; Reardon and Vosti 1997).

Block and Webb (2001) study the reverse relationship—how shocks affect diversification over time—and find that upward mobility in rural Ethiopia is related to both initial income and asset diversification. They also provide suggestive evidence that income diversification is driven by personal perceptions of risk, and that poor households may thus gradually catch up with wealthier households. Canagarajah Newman, and Bhattamishra (2001) find that nonfarm earnings in rural Ghana and Uganda contribute to rising inequality—especially amongst female-headed households—but that lower income groups also receive some benefits due to income spillover effects. However, people living in remote savannah regions and in more conflictive areas receive 40 to 60 percent lower nonfarm earnings, and infrastructure constraints strongly limit the returns to diversification.

Out-migration can be considered as a more attractive strategy for income diversification, and remittances are found to support household welfare. More important, income from remittances is more likely to be used for input intensification or soil conservation investments (compared to revenues derived from nonfarm activities that are largely used for direct consumption), thus enabling households to overcome binding credit constraints (Brons 2005; Holden, Shiferaw, and Pender 2004; Massey and Taylor 2004). While initial access to migration is strongly mediated by education, the availability of networks enables further migration of family members and relatives. However, mobility also has a negative impact on the HIV/AIDS incidence in LFAs, since migrants who contracted and spread the disease cause high medical and funeral costs to their families (Muller 2004).

Demography and Life Cycle

Population characteristics such as household size, family structure, and gender and age composition are important determinants for consumption and investment decisions. Although urban-rural differences in wealth and living standards are widely addressed in the literature, remarkably little work is done on intrarural demographic patterns and trends. Datt and Ravallion (1996) analyze the large regional disparities of living standards in rural India and find that initial conditions (land, infrastructure, irrigation, education, and health) significantly influence growth rates, but exhibit divergent effects. However, some regions with high initial poverty have higher rates of poverty reduction, particularly due to higher agricultural growth rates.

Demographic change might be a major factor for explaining poverty dynamics in LFAs. Wodon (2000) decomposes changes in per capita consumption in Bangladesh over the 1983–1996 period and finds that returns to demographic variables (household size, dependency ratio, age, education, and gender) account for the lion’s share of the change in consumption. Similarly, Lopez and Valdés (2000) observe for Latin American countries a strong inverse relationship of rural income with both family size and dependency ratio.³ Large households are often associated with higher poverty rates, although age composition may enable more flexibility in reacting to shocks. Many of these relationships are spatially correlated with location and landownership.

The demographic structure prevailing in LFAs is characterized by incomplete families and a highly unbalanced age and gender structure, due to out-migration of males and young people and the impact of HIV/AIDS. Consequently, the dependency ratio is usually high, and therefore life cycle effects and position in the social hierarchy account for a diversity in livelihoods (Bird 2002). This is further reinforced by the decline in mortality that precedes the decline in fertility, leading to a delayed demographic transition.⁴ Important implications for activity choice are that smallholders tend to select labor-extensive activities that generate stable (albeit low) income streams. Ethiopian households with

³ Lanjouw and Ravallion (1995) provide some empirical and methodological criticism against this view. Moreover, Clay and Johnson (1992) indicate that landholding size might drive fertility change under conditions of scarce land availability, but when land is abundant the opposite relationship holds.

⁴ Lipton (2005) refers to the “demographic window” as a temporary opportunity for escaping from poverty in Sub-Saharan Africa, where the workforce grows and child population slows down, thus leading to lower dependency rates for the next 20 to 25 years.

a higher dependency rate and older heads are also found to be more involved in diversification activities (Block and Webb 2001; Gillespie 1989). Although female-headed households are likely to face additional resource and time constraints, recent evidence from studies on southern Africa indicates that their escape from patriarchal controls enables women to undertake more self-employment activities that provide them with a higher income (Niehof 2004).

Engagement in networks and possibilities to rely on social capital for reinforcing livelihoods in LFAs represent important additional dimensions for access to food and resources (Adger 2003). Trust, reciprocity, and related rules and norms for bonding, bridging, and linking within and between communities provide a framework for exchange and insurance. Bryceson (1999) fears that the integrity of family units and traditional social structures may be threatened by HIV/AIDS and political unrest that lock families into farming and impede the transfer of skills and knowledge between generations.

Health and Education

Literacy rates and life expectancy in rural areas are consistently below the national average, whereas infant mortality and school dropout rates are usually higher. Distance and resource constraints tend to limit the provision of health and educational services to smallholders in LFAs. Poor health status is further reinforced by the scarcity of safe water, electricity, and sanitation facilities. Consequently, a large share of household expenditures has to be used for consumption as well as for medical and transport costs, and little is left for investments to improve smallholders' living conditions and the quality of labor.

It is sometimes argued that social investments to provide healthcare, education, and training to people living in LFAs might be of limited effectiveness, since returns to human capital strongly depend on complementarities with physical capital (Jamison and Lau 1982). Empirical studies in Vietnam and India indeed confirm that less education is associated to lower returns to investment and lower wage rates (van de Walle 2000). Fan and Chan-Kang (2004) demonstrate that returns to investment in education are consistently higher in LFAs of Uganda, China, and India (but in absolute terms substantially lower compared with investments in roads or agricultural research and development).

Given the difficulties of influencing the demand for education and healthcare, main attention should be given to strategies to reduce access costs and risk. Local community organizations are considered an effective agency for participatory management and empowerment (Binswanger 2005). In addition, to reduce the impact of shocks on schooling and health expenditures, proactive approaches (such as the Progresa program in Mexico) rely on conditional cash transfer programs linked to school attendance or healthcare demands. Integration of rural service provision with insurance offers new opportunities for improving the resilience of livelihoods and the effectiveness of service provision and input support systems.

4. Shocks, Conflicts, and Relief

Widespread poverty and degradation of the natural resource base of LFA smallholders are considered to be caused by vulnerability and risk that lead to unexpected shortfalls in consumption and ultimately to the loss of assets. Variability in itself is increasingly considered as a prime cause of persistent poverty and poverty traps (Barrett and Carter 2005). Natural risk related to weather fluctuations (drought, floods, climate change) and personal losses (illness, death) also have implications for household behavior and may eventually undermine social community relations (loss of trust).

Variability, volatility, and vulnerability deserve a central place in the discussion of poverty in LFAs. First, we review the evidence regarding the incidence of climatic and health shocks in LFAs and the household responses for coping and mitigating such events, and focus on the implications for poor people's livelihoods. Second, we discuss the role of conflicts in occasioning particular development traps, and the critical role of local institutions to support the rebuilding of rural livelihoods. Finally, we comment on the effectiveness of several alternative relief strategies that enable rural households to insure against risk and to reduce the cost of risk management.

Vulnerability and Shocks

Income shocks and risk of unforeseen events have particularly strong welfare effects for poor households in LFAs. Rainfall variability and other stochastic events are responsible for low yields and high production risks, as well as problems of runoff and erosion during intense showers, especially given limited soil cover and intensive tillage of annual crops on steep slopes. Given the short rainy season, the timing of sowing is very critical to productivity (Hengsdijk, Meijerink, and Mosugu 2005). For farmers in the Ethiopian highlands who plant close to the optimal sowing date, soil and water conservation measures can increase yields by as much as 40 percent on steep slopes (Hengsdijk, Meijerink, and Mosugu 2005). Climate change tends to increase the variability of rainfall in semiarid areas of Sub-Saharan Africa, and therefore smallholder production systems are likely to face larger shocks and higher vulnerability (Dietz, Ruben, and Verhagen 2004).

In theory, the negative effects of shocks can be addressed through two different mechanisms (Dercon 2005): (1) *ex post* risk coping: households and individuals may have to sell their assets or reduce education efforts beyond certain critical recovery levels; and (2) *ex ante* mitigation: households and individuals will select less risky activities that yield lower returns and are thus unable to take advantage of more rewarding options. Consequently, risk reduces income levels and thus reinforces asset poverty, and at the same time decreases the returns to assets.

Detailed studies regarding the incidence of shocks for rural livelihoods in Ethiopia indicate that almost all households registered over the 1999–2004 period experienced some type of shocks, but drought (46.8 percent), death (42.7 percent), and illness of a household member (28.1 percent) were most frequently affecting income or consumption levels for many years, and occasioned the loss of key assets (Dercon 2005). In a similar vein, Alderman, Hoddinott, and Kinsey (2003) review the long-term impact of the 1982–1984 droughts and civil war on child health and education in Zimbabwe, and calculate a 7 percent loss in children's lifetime earnings. Suryahadi and Sumarto (2003) and Spencer, Matlon, and Löffler (2004) trace the effects of the economic crisis in Indonesia for poor households. They conclude that because of the loss of assets and education many households still experience poverty effects from the 1998 shock. Carter and May (1999) register in rural South Africa that 50 percent of households fell into poverty because of earlier asset losses. Ruben and Masset (2003) find that distress sales of land and cattle in Nicaragua after hurricane Mitch in 1998 led to an almost 50 percent income loss and forced many farmers into chronic poverty. Once assets are sold, it becomes almost impossible to recover the asset base, given the low returns on remaining activities. Empirical work to identify dynamic asset poverty thresholds, defined as minimum asset levels that enable smallholders to engineer their own growth, seems to indicate that at least a doubling of assets would be required to ensure full escape from poverty (Lybbert et al. 2004; Adato, Carter, and May 2004).

Risk mitigation strategies refer to the behavioral impact of shocks on household portfolio and technology choice. Smallholder strategies for reducing the impact of risk have poverty implications. They include selection of low-risk cropping activities, reduction of the use of risky inputs (inorganic fertilizers), and diversification of the activity portfolio. As a consequence, some more profitable opportunities will not be taken up and risk aversion will thus lead to lower returns to efforts. In addition, smallholders may retain a too high level of assets in order to enable consumption smoothing. In Indian semiarid areas, poor farmers devote a large share of land to the safer traditional rice and castor varieties than to riskier but higher-return varieties, while using too much labor and too low levels of fertilizers (and maintaining too many bullocks) to reach optimum production levels (Morduch 1995; Rosenzweig and Wolpin 1993; van der Berg 2001). Fertilizer use would substantially increase if farmers could be better insured against downside consumption risk. Dercon (1996) and Salasya (2005) find similar evidence for Ethiopia and Kenya: poorer households grow substantially larger areas of low-return, low-risk food crops compared with households that possess more assets, and they surpass optimal sowing dates to be more secure on rainfall.

Conflicts and Trust

Variability and vulnerability to shocks may have different implications for personal relations, social networks, and cooperation. Large differences in wealth and power within rural communities can be a cause for conflict and are usually considered a constraint to collective action (Baland and Platteau

1996). Village communities in LFAs are far from homogeneous in terms of class, origin, and ethnicity, but that may also offer some prospects for mutual exchange.

Different types of conflict have emerged in LFAs due to competing claims on natural resources (especially with increasing population pressure) and as a result of competing political interests. In semiarid Sub-Saharan Africa, many conflicts are fueled by land degradation, resulting in the expansion of cultivated area and the maintenance of longer fallow periods at the expense of traditional migrant herders (Breusers 1998). In local settings where kinship and ethnicity mediate the relation with village authorities that are critical for getting access to the land, disruption of those traditional networks seriously undermines the framework for conflict resolution (Hendrickson, Armon, and Mearns 1998). Under conditions of civil war and political crisis, theft of animals or harvests and expropriation of land represent serious threats. To avoid contractual disputes and problems of broken relationships, most trade transactions take place within established networks as instantaneous exchange on a cash basis (Fafchamps 2004).

Emerging or open conflicts may have profound implications for the disruption of social networks in LFAs. While there is some scanty evidence that social capital in remote areas may partly compensate for scarce resource endowments (Bebbington and Perreault 1999)—especially due to the preference of nongovernmental organizations for working in LFAs—community organizations can be easily captured by local elites in the absence of countervailing public entities (Ribot 2002). When conflicts lead to increasing (male and youth) mobility, family structures and workforce composition in local communities will be affected, and people might become more vulnerable to health risks (Muller 2004). In addition, conflicts may disrupt relational trust and thus force people to maintain large internal reserves and stocks for facing idiosyncratic shocks.

Gender disparities in land property rights and intrahousehold differences in access to resources and education account in Kenya and Burkina Faso for at least 20 percent of productivity loss and discourage investments in sustainable farming practices (Quisumbing 2003). Women play a key role in household strategies for dealing with vulnerability and risk, and strengthening their position through the removal of access barriers is highly important for ensuring food and nutrition security. Otherwise, Glewwe and Hall (1998) find that, controlling for other factors, female-headed households in Peru are not more vulnerable to shocks, probably due to large network effects.

Relief and Insurance

Risk management and relief programs are meant to enable LFA smallholders to reduce the impact of shocks (*ex ante*) and to provide transfers once shocks have occurred (*ex post*). Most empirical studies address the second type of relief measures (i.e., food aid, food for work, etc.), while recent attention is shifting to the options for improving households' risk management capacities.

Food aid programs are generally used to provide food rations to people living in areas facing acute hunger problems. There has been considerable debate on how to avoid disincentive effects and disruption of local food and factor markets (Barrett 2002). Recently, more attention is given to the factors that determine allocation of food aid across households and regions. Jayne et al. (2002) argue for Ethiopia that efficient delivery of food aid involves substantial fixed costs and that therefore targeting of food aid proved to be spatially concentrated in regions where earlier programs had been implemented, rather than focusing on areas where rainfall shocks affected yields.

Food-for-work activities are frequently used in LFAs for rural infrastructure construction or rehabilitation and to support soil and water conservation activities. Drought-relief interventions that rely on food-for-work programs can be sometimes helpful in reducing the pressure on natural resources when they are most vulnerable. Providing rural employment to landless people and women contributes to poverty alleviation and can reduce land conflicts. Food-for-work used to promote investment in natural resource conservation tends to be more effective in settings with constrained labor and capital markets. The total costs of food-for-work programs are, however, extremely high (transport costs commonly take half the resources), and participants typically accept a lower cash wage to do the same work (Barrett and Maxwell 2005). Moreover, monetizing food aid is a quite expensive method for generating cash resources. Effective poverty targeting of food-for-work activities requires a narrow definition of eligible households based on criteria of asset ownership.

In recent debates on risk-coping mechanisms, attention has shifted to strategies that enable households to reduce the impact of shocks and that provide them some form of insurance against unexpected income shortfalls and asset losses. Different alternatives of self-insurance (savings schemes), mutual support networks (funeral societies, ethnic networks), and microinsurance products supported by voluntary organizations and the private sector mainly offer protection against idiosyncratic shocks that are responsible for most distress sales (Udry 1994; Kochar 1995). Ongoing experiments with weather-based insurance seem to offer an efficient and low-cost risk relief for smallholders facing stochastic events in semiarid India (Gine et al. 2005).⁵

5. Exploring LFA Development Pathways

Targeting public investment to smallholders in LFAs has been shown to generate relatively good economic returns, and it results in an even better impact on poverty reduction and environmental protection (Fan and Hazell 2001). Infrastructure investments, agricultural research and extension, and education almost invariably reveal highest rates of return in LFAs.⁶ Similarly, at a more aggregate level, aid effectiveness tends to be greater in vulnerable countries and regions, and these are thus good economic reasons for targeting assistance to LFAs (Guillaumont 2005).

Fragile resources and scarcity of assets are mainly responsible for the coexistence of widespread poverty and natural resource degradation in LFAs. The interlinkages between both phenomena and their causal relationship are still subject to a wide debate (Scherr 2000). In most LFAs, households living in chronic poverty face critical asset constraints that inhibit the necessary intensification and integration of their agricultural production systems. Consequently, resource degradation is occurring mainly in settings where access constraints and institutional failures keep individuals and households trapped in persistent poverty (Barrett and Carter 2005).

Development Pathways

Development pathways for smallholder development in LFAs should address the key constraints originating from variability, heterogeneity, and vulnerability through carefully designed intervention strategies that effectively reduce critical thresholds. Therefore, three major strategic options need to be simultaneously considered:

1. Increasing access to most-limiting inputs (especially nutrients) and technologies that enable farmers to enhance synergies and complementarities within integrated farming systems and to improve their input efficiency
2. Strengthening the diversification of livelihood options (both within farming and through engagement in nonfarm activities and migration) with investments that reinforce human (and social) capital at individual and household levels
3. Reducing the vulnerability and risk exposure of rural households through insurance, exchange, and information networks that enable them to improve their returns to investments in farming and nonfarm activities

Integration of production systems and diversification of livelihood strategies could thus simultaneously reinforce smallholder farming in LFAs, whereas institutional regimes for reducing risk are necessary to enable households and villages to make the required investment efforts. Public investment plays a decisive role in overcoming binding resource constraints, but local knowledge and community organization are required to make sure that the poor can effectively benefit from these investments.

Given the socioeconomic diversity and biophysical heterogeneity prevailing within most LFAs, smallholders will selectively engage in different combinations of income-generating activities, thus dovetailing agricultural intensification and activity diversification in a variety of ways. Multiple pathways are likely to emerge, depending on the local agro-ecology, population density, and access

⁵ McCarthy (2005) suggests, however, that livestock insurance in erratic environments could easily lead to overstocking.

⁶ Krugman (1991) and other new geographical economists argue that a reduction in transport costs and greater factor mobility might eventually reverse the competitive advantage in favor of LFAs, given their lower wages, but they largely disregard the increased vulnerability to (demand and technology) shocks.

conditions and the degree of institutional development met in local communities (Jansen, Siegel, and Pichon 2005; Pender 2004; Brons et al. 2004). In a similar vein, smallholders will take advantage of specific local conditions through differential engagement in land, labor, and output markets.

Policies and Incentives

Development policies and instruments need to be identified that address the structural constraints in LFAs and enable smallholders to rearticulate their livelihood strategies. Most current research provides useful insights into the effectiveness of specific incentives in particular settings, without always fully considering the interactions between local and household-specific factors and the behavioral responses to the intrinsic variability and vulnerability in LFAs.

Following de Janvry and Sadoulet's (2005) plea for a new integral approach to regional development that recognizes heterogeneity in circumstances and diversity in rural livelihoods, we propose a policy framework based on three leading principles:

- a. *Asset building for the poor*—including improved access to land and input markets, investments in human capital (education, training), and social capital formation, both for increasing households' capacities to withstand shocks and for enhancing the returns to their own resources. Key interventions in this area focus on landownership, local public works and/or conditional cash transfer for education and healthcare, stocking schemes, fertilizer provision, and research and development for improved management of mixed systems.
- b. *Market integration*—both in physical terms (road networks) and in terms of communication and information, in order to reduce transaction costs and enhance labor mobility. Key interventions are related to infrastructure investments (public-private partnership), community storage and marketing schemes, early warning systems, and smallholder engagement in environmental services payment schemes.
- c. *Institutional development*—building and strengthening local networks for cooperation, coordination, insurance, and innovation in order to address critical resource and knowledge bottlenecks, create synergies around LFA comparative advantages, and enhance positive spatial externalities. Key interventions include microfinance and weather insurance schemes, community land rehabilitation programs, and associate trade networks.

Notwithstanding the growing consensus regarding these general policy devices, the existing heterogeneity of resource endowments and land management regimes asks for a flexible policy framework that is capable of responding to local opportunities and demands. The implementation of such a territorial approach to LFA development thus requires a high degree of decentralized governance based on broad popular participation and decisive empowerment of the poorer groups.

Knowledge Gaps

For policy purposes, three issues need further exploration. First, it is important to assess the *initial conditions* that influence returns to investments in LFAs. Both landownership and human capital have been acknowledged as mediating factors for access to markets and institutions. Identifying the critical asset thresholds that enable households to achieve a structural escape from poverty is particularly important. Second, the breakpoints for reaching effective *synergies and feedback* need to be better understood, especially when households meet investment barriers for overcoming poverty and resource degradation due to incompletely fungible assets or missing markets. When input or factor substitution options are limited—because of internal or external factors—returns to investment remain structurally low and unstable, and resource intensification is likely to be too much labor-led instead of capital-led. Third, *investment complementarities* deserve further study, especially the relationships between public and private resources and interactions between physical and human assets. The challenge here is to identify a minimum package of well-synchronized investment opportunities—balancing farm and nonfarm options as well as production and exchange activities—that generates multiplier effects and attracts additional resources to the LFA smallholder economy.

Further research for identifying feasible and effective LFA development pathways should be focused on the interlinkages between agricultural production systems and rural livelihoods in order to disentangle key determinants of spatial poverty traps and identify appropriate strategies for overcoming asset poverty. In addition, it would be extremely helpful to define clear “recommendation domains” for different types of interventions, as well as the optimal mix and sequence of different policy incentives based on an improved understanding of household responses to single and combined interventions. Such research requires the availability of panel data sets that include both production and consumption behavior as well as information on asset dynamics, and it could greatly benefit from new advances in spatially explicit simulation modeling.

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Smallholder Farming in Difficult Circumstances: Policy Issues for Africa *

T.S. Jayne, Professor, International Development, Department of Agricultural Economics, Michigan State University, USA

D. Mather, Assistant Professor, International Development, Department of Agricultural Economics, Michigan State University, USA

E. Mghenyi, graduate student, Department of Agricultural Economics, Michigan State University, USA

1. Introduction

In Sub-Saharan Africa, “difficult circumstances” would apply to at least two-thirds of the small farm population. Most small farmers in Africa directly or indirectly suffer the effects of civil disruptions and political turmoil, HIV/AIDS, and weak support from their governments compared to almost all other parts of the world with regard to funding for agricultural science and technology, extension support, health and education. Many small African farmers find themselves on the low end of a tilted global agricultural trading system. Their future is further jeopardized by declining international development assistance. The increasingly privatized and effective demand-driven international agricultural research systems are largely being influenced by the priorities of large farms in high-income countries, putting greater distance between farmers in high- and low-income countries in terms of access to productive new technologies.

To be sure, there are relative differences in the severity of the difficulties faced by African smallholders, and it would be possible to focus research attention on the bottom 25% of farms defined by certain criteria as being in relatively difficult circumstances. However, we choose not to do this, first because most small farms in Sub-Saharan Africa are in difficult circumstances compared to farms in almost all other areas of the world, and second, because the broad development agenda for the bottom 25% of small farms in Africa is largely the same as those for the bottom two-thirds.

This paper identifies major trends and near-term processes affecting the future of the small farm in the region, identifies policy responses and public investment strategies by African governments, governments of high-income countries, and multilateral donors that are likely to be required to give the small farm the chance to be viable in an increasingly globalized world.

The basic problem is that the small farm in Africa is becoming increasingly unviable as a sustainable economic and social unit, and unless government policy is changed radically, the world will see economic and social crises in Sub-Saharan Africa with increasing frequency and severity. Many of these crises are likely to have global repercussions, which is why, even from an insular and self-interested perspective, groups in the rest of the world would find it in their interests to pay attention to the challenges facing the small farmer in Africa and other low-income regions of the world. Our main premise is that without real changes in the implementation of development assistance, world trade protocols, and the allocation of resources by governments, most of the small farms in Africa will face a very uncertain and untenable future, involving major dislocations, migration, growing problems of urbanization, and increasingly chronic crises of hunger and poverty. Even with positive changes in these key policy areas, the number of small farms in Africa will nevertheless shrink through structural transformation processes driven by agricultural productivity growth, but with much less severe dislocations and crises in the process.

The main messages of this paper are that (1) the challenges facing small farms in difficult circumstances is largely the same set of challenges involved in achieving broad-based agricultural growth

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and rural development; (2) the keys to reviving the health of the small farm sector in Africa involve the supportive decisions of national and international actors – it is not simply a matter of local communities organizing themselves effectively, because they lack the resources to counteract the effects of much larger forces and decisions under national and international jurisdiction; (3) over the long run, the most optimistic scenario for the small farm sector is likely to involve enabling most smallholder households to exist farming by being ‘pulled’ into other sectors of the economy through rising demand for non-farm jobs that, as history has shown, generally starts with sustained agricultural productivity growth; and (4) a meaningful agricultural growth strategy aimed to support the small farm, including those in the most difficult circumstances, will need to match recent promises of support for “pro-poor” agricultural growth with necessary financial support and policy attention. Doing so will be crucial to generating the economy-wide benefits to the poor associated with inter-sectoral multiplier effects associated with structural transformation.

To make our points, we occasionally draw on recent nationwide surveys of small-scale farm households in Kenya, Zambia, Malawi, and Mozambique. The details of the data sets are contained in Appendix 1. Other arguments are drawn not on the basis of empirical or historical evidence but rather on assumptions of future trends and conceptual models. Section 2 deals with major trends affecting the viability of the small farm, primarily in eastern and southern Africa: inequitable land distribution, stagnant food crop productivity, the concentration of marketed surplus from the small farm sector, inequitable returns to non-farm activities, civil disruptions, HIV/AIDS, farm supports in high-income countries and global agricultural trade policies, and declining donor assistance for the small farm. Section 3 deals in broad terms with needed changes in institutions and organizations, and policies to promote investment and productivity growth in the small farm sector.

2. Major Trends Affecting the Viability of the Small Farm in Eastern and Southern Africa and their Implications

2.1 Decline in Land/Labor Ratios and Inequitable Land Distribution

Relative to other areas of the developing world, Africa has been seen as a continent of ample land and scarce labor. While this was true decades ago and may still apply to some areas where smallholders leave arable land uncultivated due to lack of labor or draught power, it no longer applies to much of southern and eastern Africa. One of the most important trends in African agriculture is a steady decline in the land-to-person ratio. Between 1960 and 2000, according to FAO data, the amount of arable land under cultivation (including permanent crops) has risen marginally, but the population of households engaged in agriculture has tripled. This has caused a steady decline in the ratio of arable land to agricultural population (Table 1). In Kenya, Ethiopia, and Zambia, for example, this ratio is about half as large as it was in the 1960s.

Table 1. Ratio of Cultivated Land to Agricultural Population (10-Year Means)

	1960-69	1970-79	1980-89	1990-99
Ethiopia	0.508	0.450	0.363	0.252
Kenya	0.459	0.350	0.280	0.229
Mozambique	0.389	0.367	0.298	0.249
Rwanda	0.215	0.211	0.197	0.161
Zambia	1.367	1.073	0.896	0.779
Zimbabwe	0.726	0.664	0.583	0.525

Note: Land to person ratio = (land cultivated to annual and permanent crops) / (population in agriculture).

Source: FAO Stat database: <http://faostat.fao.org/faostat/collections?version=ext&hasbulk=0&subset=agriculture>.

In addition, the distribution of available land is highly inequitable. It is well-known that the colonial legacy has left much of Africa with severe land inequalities between smallholder, large-scale, and state

farms. Redressing inequalities between these farm groupings is likely to be an important element of an effective rural poverty reduction strategy in countries such as Zimbabwe and Kenya. Yet, perhaps less well-recognized is that there are major disparities in land distribution within the small farm sector itself. In eastern and southern Africa, the smallholder farm sector is typically characterized as small but relatively “unimodal” and equitably distributed landholdings situated within a “bi-modal” distribution of land between large-scale and small-scale farming sectors. By contrast, Jayne et al (2003) found consistently large disparities in land distribution within the small farm sector using national household survey data in Ethiopia, Kenya, Malawi, Mozambique, Rwanda, and Zambia. While average land holdings in the small farm sector range from between 2.5 and 3.0 hectares in Kenya and Zambia to around one hectare in Rwanda and Ethiopia, mean farm size figures mask great variations.

For example, after ranking all smallholders by household per capita land size, and dividing them into four equal quartiles, households in the highest per capita land quartile controlled between five to 15 times more land than households in the lowest quartile (Table 2). In Kenya, for example, mean farm size for the top and bottom land quartiles were 6.69 and 0.58 hectares, respectively, including rented land. The range of computed Gini coefficients of rural household land per capita (0.50 to 0.56) from these surveys show land disparities within the smallholder sectors of these countries that are comparable to or higher than those estimated for much of Asia during the 1960s and 1970s (Haggblade and Hazell 1988). If these countries’ large-scale and/or state farming sectors were included, the inequality of landholdings would rise even further.

An additional problem is the extremely low absolute level of landholding/capita among some households. In each country, the bottom 15-20 percent of small-scale farm households are approaching landlessness, controlling less than 0.5 hectares. In Ethiopia and Rwanda, the bottom land quartile controlled less than 0.20 and 0.32 hectares per capita. In Malawi, 80 percent of all smallholder households possess less than one hectare of land (Chirwa 2005).

Table 2. Mean Household Attributes by Landholding Size Per Capita Quartile, Various Countries

Country (survey year)	Household Attribute	Total	Quartiles of Per Capita Farm Size			
			1	2	3	4
Kenya	Landholding size (ha)	1.77	0.64	1.18	1.84	3.45
2000	Gross value of crop sales (2000 US\$ per hh)	1,067.0	484.7	750.5	1,419.8	1,611.7
	Household income (2000 US\$ per capita)	553.9	272.6	379.4	568.2	998.4
	Off-farm income share (%)	29.5	35.4	28.6	28.7	25.6
Ethiopia	Landholding size (ha)	1.17	0.20	0.67	1.15	2.58
1996	Gross value of crop sales (1996 US\$)	145.8	33.7	82.3	120.6	265.2
	Household income (1996 US\$ per capita)	71.6	53.1	52.1	88.3	91.0
	Off-farm income share (%)	8.1	13.7	9.0	5.4	4.6
Rwanda^a	Landholding size (ha)	.94	0.32	0.63	1.00	1.82
2001	Gross value of crop sales (1991 US\$ per hh)	68.0	34.1	45.1	72.4	169.3
	Household income (1991 US\$ per capita)	78.7	54.5	59.4	79.3	139.7
	Off-farm income share (%)	24.8	34.5	24.4	22.2	18.2
Mozambique	Landholding size (ha)	1.66	0.53	1.20	1.76	3.14
2002	Gross value of crop sales (2002 US\$ per hh)	26.7	9.4	20.9	27.3	49.1
	Household income (2002 US\$ per capita)	59.5	45.7	46.4	55.4	90.6
	Off-farm income share (%)	27.3	34.3	26.6	24.9	23.5
Zambia	Landholding size (ha)	2.73	0.74	1.60	2.75	5.81
2000	Gross value of crop sales (2000 US\$ per hh)	72.2	32.7	59.2	83.6	113.4
	Per capita income (2000 US\$ per capita)	122.3	107.5	107.0	115.6	159.2
	Off-farm income share (%)	28.4	28.5	39.7	27.0	25.0

Source: compiled from various tables presented in Jayne et al., 2003 and authors’ estimates.

Notes: Samples include only “agricultural households” defined as households growing some crops or raising animals during the survey year. All numbers are weighted except Kenya. Income figures include gross income derived from crop production on rented land.

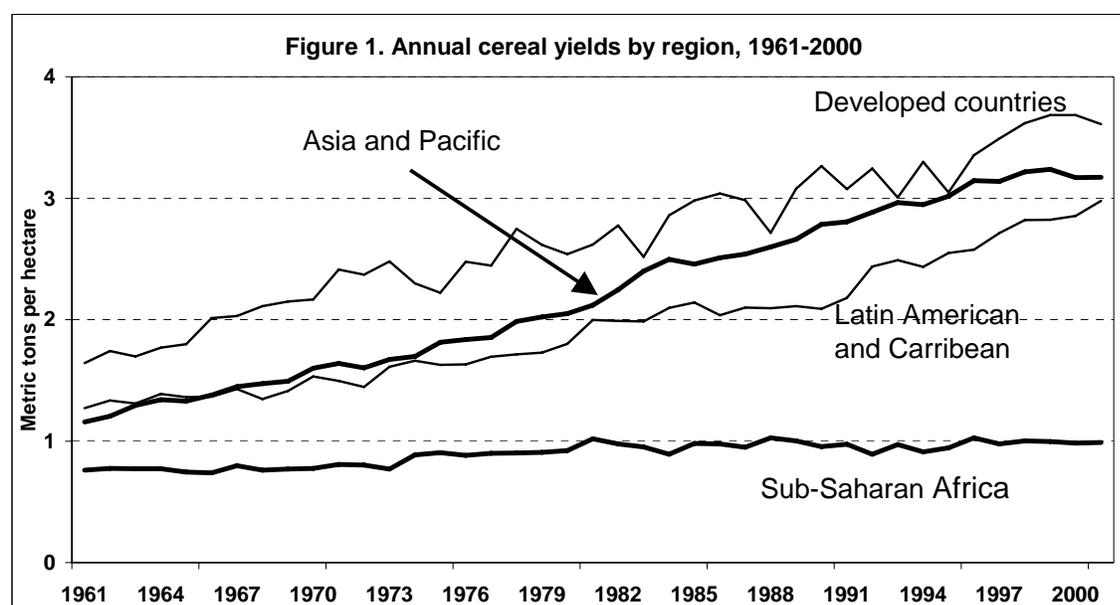
^a For Rwanda: data is not available for land loaned out, only data on rented land is included.

Both the inequality of land access and the low absolute levels of land/capita of some households are problematic for poverty reduction and growth for several reasons. First, there is a strong relationship

between access to land and household income in southern and eastern Africa, particularly for farm sizes below 1 ha/capita (Jayne et al, 2003). Mean total household incomes of the top land quartile are double those of the bottom quartile (Table 2). This relationship appears to be driven by limited access of land-poor households to lucrative non-farm income opportunities and higher-value crop or livestock markets, as is discussed further below. Second, it is generally accepted that “pro-poor” agricultural growth is strongly associated with equitable asset distribution (Datt and Ravallion, 2004; Gugerty and Timmer, 2000), yet surprisingly little attention has been devoted to considering the implications of land inequality in poverty reduction strategies.

2.2 Stagnant Productivity of Food Crops

Over the last 40 years, food crop productivity has risen throughout the rest of the world yet remained stagnant in Africa (Figure 1). Explanations for this are many, though usually center on the limited use of irrigation, fertilizer, and improved cultivars – the absence of an African Green Revolution.



Source: FAO Stat database: <http://faostat.fao.org/faostat/collections?version=ext&hasbulk=0&subset=agriculture>.

Agricultural productivity growth is centrally important for improved living standards in both rural and urban areas. Currently, land pressures and low productivity are combining to generate a “push” form of labor migration out of rural areas (rather than the “pull” effect of structural transformation), contributing to the swelling of Africa’s cities and social problems associated with this. The view that many rural areas have effectively reached the limits of their carrying capacity are consistent with Tiffen’s (2004) observation that rural population growth is less than one percent per year while urban population continues to grow rapidly in most of Africa.

Increases in food crop productivity will likely remain a key driver of rural nonfarm activity in Africa, and not vice-versa, for several reasons. First, African spending patterns support far less rural nonfarm activity than do those in Asia, as African consumers spend far more of their average and marginal income on rurally produced foods, a result due to low income levels as well as lower population and road density (Haggblade and Hazell, 1989). Second, in countries such as Mozambique and Zambia, nearly 2/3rds of rural households derive most of their total income from retained food crops. Yet, even considering the predominance of food self-provision in these households’ income activities, many households are still net

buyers of major staple crops such as maize. Widespread productivity increases in food crops would therefore release labor and capital from food crop production — for large numbers of households, especially the poorest — making them available for the production of higher-value crops and non-farm activities such as manufacturing and services. This is likely to not only increase the food consumption of poor households but, as incomes grow, should also eventually increase the portion of household disposable cash income that is spent on non-staple foods and consumer goods, as per Engel's law. Finally, history suggests the necessity of productivity increases in agriculture: except in the cases of a handful of city-states, there are virtually no examples of mass poverty reduction since 1700 that did not start with sharp rises in employment and self-employment income due to higher productivity in small family farms (Lipton, 2005).

2.3 Concentration of Farm Sales and Commercialization

One potential pathway out of poverty for smallholders with limited landholding is to earn greater returns per unit of land by diversifying into higher-value crops and animal products. There is some evidence that this is occurring: cross-sectional community fixed-effects models from Kenya indicate that horticulture's share of crop revenue and area is significantly inversely related to farm size (Jayne et al., 2005). However, these opportunities are impeded by measures that raise the costs and/or risks of household staple food acquisition through markets (in addition to input and output marketing constraints common to small farmers). The higher the price of food, and the greater the price variability during the lean season, the greater the household incentives revert to self-provisioning of food staples (Fafchamps, 1992; Jayne, 1994; Omamo, 1998). Thus, diversification into higher-value crops is most likely to occur in densely populated rural areas and peri-urban areas, where high population pressure results in low land/labor ratios, food markets are more likely integrated with nearby urban markets, and demand for horticultural crops and animal products is high.

Crop sales income remains strongly correlated with landholding size (Table 2). The gross revenue generated from crop sales among households in the top farm size quartile exceeded that of the bottom land size quartile by 8 to 11 times, except in the case of Rwanda, where the difference was only 5 times as great (Table 2).¹

In eastern and southern Africa, maize is not only a major staple in many regions but also a cash crop. Thus, we might expect smallholders to more readily commercialize a crop which is both consumed and marketed. Yet, the evidence suggests that the combination of inequitable land access and large variations in crop productivity across households and regions contributes to considerable heterogeneity with respect to smallholders' position in staple food markets. For example, nationally representative household surveys in eastern and southern Africa where white maize is the staple food indicate that small-scale farm households generally fall into one of the following four categories with respect to the grain market (Table 3):

1. *sellers of staple grains*: Roughly 20 to 35 percent of the small farms in the region sell maize, the main staple, in a given year. This figure rises in good harvest years and falls in a drought year. However, there are two sub-groups within this category:
 - a very small group of relatively large and well-equipped smallholder farmers with 4 to 20 hectares of land, usually in the most favorable agro-ecological areas (about 1 to 4 percent of the total rural farm population), accounting for 50% of the marketed maize output from the smallholder sector.

¹ Despite these disparities in land allocation within the small farm sector in these countries, one could find this farm structure unalarming in comparison with some Asian countries. For example, the mean farm size for 80 percent of the landholdings in South Asia (Pakistan, India, and Bangladesh) is 0.6 hectares. However, the greater scope for off-farm employment, coupled with the higher productivity of farming arising from more effective water control, the use of purchased inputs, and the greater scope for multiple croppings per year in much of Asia warrant caution in comparing farm sizes with those in Africa, or even within African countries.

- a much larger group of smallholder farms (20 to 30 percent of the total rural farm population) selling much smaller quantities of grain. These households tend to be slightly better off than households that buy grain, but the differences are not very great in absolute terms.
2. *buyers of staple grains:* Roughly 50-70 percent of the rural population consistently buys maize, with this figure higher in drought years and lower in good production years. These households are generally poorer and have smaller farm sizes and asset holdings than the median rural household. They are directly hurt by higher grain prices.
 3. *households buying and selling grain within the same year:* In all of the nationwide surveys reported in Annex 1, relatively few households both buy and sell maize.² Only about 5 to 15 percent of the rural population buys and sells maize in the same year. These include relatively large farms that sell grain and buy back lesser amounts of processed meal, and relatively poor households that make distress sales of grain after harvest only to buy back later in the season.

Table 3. Distribution of Small-Scale Farm Population According to their Position in the Staple Grain Market, Selected Countries

Household category with respect to main staple grain:	Zambia (maize)	Mozambique (maize)	Kenya (maize)	Malawi (maize)	Ethiopia (maize and teff)
	----- % of rural farm population -----				
Sellers only:	19	13	18	5	13
top 50% of total sales*	2	2	2	1	2
bottom 50% of total sales**	17	11	16	4	11
Buyers only	33	51	55	na	60
Buy and sell (net buyers)	3	12***	7	na	13
Buy and sell (net sellers)	6		12	na	12
Neither buy nor sell	39	24	8	na	2
	100%	100%	100%	100%	100%

Notes:

* After ranking all households by quantity sold, this row shows the percentage of households in the smallholder sector accounting for the first 50% of total maize sale.

** Percentage of households accounting for the other 50% of total maize sales.

*** The survey in Mozambique was not able to ascertain quantities of maize purchased therefore whether these households are net buyers or net sellers is unknown.

Sources: Jayne et al., 2005a.

4. *households neither buying nor selling maize:* these households make up a small proportion of the rural population in areas where maize is the dominant staple crop. However, in parts of northern Zambia and Mozambique, cassava is the main staple. Because of this, a sizable fraction of the rural population at the national level is autarkic with respect to maize.

In addition, sales income is highly concentrated among a relatively small number of large and commercialized farmers in the smallholder sector -- one or two percent of smallholders account for 50% of the overall marketed maize surplus from the smallholder sector (Jayne et al, 2005a). These farm households appear to enjoy substantially better living standards, in terms of asset holdings and total income, than the rest of the rural population: roughly 2 to 5 times as much land and productive assets as the non-selling households; 2 to 7 times as much total household income; and 3 to 8 times more gross revenue from the sale of all crops.

² This empirical regularity contrasts with the common notion that, because of lack of credit, farmers typically sell at harvest at low prices and buy back later at higher prices.

The empirical evidence presented in this section hold several important policy implications. First, farm price supports or stabilization policies that involve altering mean price levels over time (as they usually do), can have unanticipated income distributional effects that run counter to stated poverty alleviation goals. To the extent that the poor are net purchasers of staples such as maize, wheat, and rice, they are directly hurt by policies that raise prices of these commodities.³ Moreover, the benefits of mean-raising food price policies are likely to be extremely concentrated. Mean-neutral forms of price stabilization would most likely avoid these adverse distributional effects, and might also encourage diversification toward higher-valued crops by maize purchasing households (Fafchamps, 1992). Finally, strategies to link African farmers to markets must take account of the inequality in productive assets and low crop productivity, which contribute to highly concentrated patterns of agricultural surplus generation within the smallholder sector, and to the constraints on household diversification into higher-value crop production imposed by food market instability.

2.4 High Return Non-Farm Activities Limited among Households with Minimal Land and Education

Another potential pathway out of poverty for land-poor households is non-farm income. Barrett *et al* (2001) find a positive relationship between nonfarm income and household welfare indicators across much of rural Africa. However, they also find that because of substantial entry or mobility barriers to high return niches within the rural nonfarm economy, only a small proportion of rural households that are relatively well-endowed in land or human capital have access to nonfarm employment that earns a reasonable return to labor. This implies a vicious and self-reinforcing circle of unequal distribution of land and nonfarm earnings, thereby causing the nonfarm sector to have regressive effects on income distribution in rural Africa. Over time, this can lead to an increasingly skewed distribution of land and other assets (Barrett *et al.* 2001).

Consistent with Barrett *et al*, we find that while non-farm shares of total income are high among land-poor households, absolute levels of nonfarm income are typically not high enough for these households to compensate for low land endowments and earn total incomes greater than the sample median (Table 2). Only for households that have highly educated members is small farm size not inversely correlated with household income (Table 4). Note that for households in the bottom land tercile, there are relatively few households with highly-educated heads, but their income levels are nearly as high as households in the top land tercile. For land-constrained farm households, education appears to offer a pathway out of poverty, but human capital accumulation is largely a long-term and intergenerational process. Moreover, the payoffs to education will depend on non-farm job opportunities, which is ultimately dependent on broad-based agricultural growth (*i.e.*, Johnston-Mellor transformation processes).

Education, which played an important role in Asia by allowing households to exit agriculture into more lucrative off-farm jobs, is relatively low in most areas of rural Africa by world standards. Worldwide, about 113 million children were out of school in 1998, and of these, 40 percent were in Sub-Saharan Africa. At 41 percent, the illiteracy rate in the region is still high compared to the rest of the world, but fortunately it is at its lowest point ever. Of particular significance is the advance being made in girls' education, with the percentage of illiterate women slowly declining from 66 percent in 1985 to 49 percent in 1998 (World Bank 2001).

Investments in rural education will contribute to agricultural transformation and growth in a variety of ways—through the adoption of new technology, through greater public empowerment and recognition of their interests in a complex world, through the ability of citizens to articulate their interests and demand greater accountability from the political process, and through the direct contribution to labor productivity that results from public and private tasks being performed by people with higher levels of training and education. Indeed, Africa's future economic growth will depend less on exploiting its natural resources, which are subject to long-run primary commodity price declines, and more on its labor skills and its ability to integrate itself into the global economy.

³ Of course, a general equilibrium approach, taking into account indirect effects on welfare through the labor market, would need to be undertaken before the welfare effects of mean-altering price policies could be fully understood.

But investing in education is expensive; so is investing in health and agriculture. These trade-offs are simply too severe for governments to handle on their own with their limited budgets. A serious commitment to development will require a greater response from donor countries.

2.5 Civil Disturbances

Africa has a high incidence of civil war. Of the eight African countries with per capita incomes under US\$200 during the 1990s, six of them have experienced prolonged civil war—Ethiopia, the Congo, Mozambique, Sierra Leone, Burundi, and Somalia (World Bank 2001). There remain a number of weak and failed states, beset by internal violence and external pressures.

Fortunately, there are positive signs of progress. As measured by Freedom House, the number of “free” countries in Sub-Saharan Africa increased from two to eight between 1990 and 2000, the number of “partly free” countries increased from 15 to 24, while the number of “non-free” countries fell from 26 to 13 (Wolgin, 2001). There is, in many countries, a free and vibrant press. Human rights abuses, with some notable exceptions, are declining. More stable political and security conditions should provide important direct and indirect benefits for the livelihood of the small farm.

2.6 HIV/AIDS

Another trend of great concern for small farm agriculture in Africa is the HIV/AIDS epidemic. Twenty years since the onset of the disease, relatively little is known regarding how farm households respond to illness and death and the interventions that would best fit their needs. Because rigorous applied analysis of the impacts of AIDS on rural farm households has been slow to materialize, most of our understanding is based on conceptual models, macro-projections that lack a solid micro-level foundation, and sociological or anthropological community case studies that, while highly detailed and informative, present difficulties for generalization or extrapolation.

For example, most attempts to date to assess the impacts on the agricultural sectors of hard-hit African countries have been theoretical and have relied heavily on the simple logic that loss of an adult due to AIDS causes severe labor constraints in households, resulting in lower area cultivated and a shift towards less labor intensive (lower value) crops, such as cassava or sweet potatoes, and away from more labor intensive (higher value) cash crops (Toupouzis and du Guerny 1999; Harvey, 2004). The subsequent implication of this logic is that HIV/AIDS mitigation policy should prioritize agricultural labor-saving technologies and other assistance such as food aid targeted to afflicted households.

Given the cost of large-scale survey research in Sub-Saharan Africa, and perhaps a perception among donors and ministries of agriculture that HIV/AIDS is a ‘health sector issue’ (which is beginning to change), it is perhaps not surprising that there are few empirical studies of the effects of HIV/AIDS on rural household welfare and livelihoods. Yet there is some emerging evidence from large-sample micro-level surveys as well as macro-level data which can complement earlier surveys and case studies and serve to validate or modify the predictions of the theoretical literature.

Table 4. Mean Household Attributes by Landholding Size by Level of Education, Kenya (pooled 1996/97 and 1999/00), Mozambique (2001/02) and Zambia (2000/01).

	Total Sample	Landholding Tercile								
		1 - lowest			2 - middle			3 - highest		
		Education level terciles			Education level terciles			Education level terciles		
		1	2	3	1	2	3	1	2	3
No. of observations		----- mean value -----								
Kenya	1404	176	159	133	120	149	200	127	148	192
Mozambique	4515	342	573	446	422	653	432	570	622	455
Zambia	6921	914	728	619	693	749	681	667	902	968
Landholding size (ha) ¹										
Kenya	1.77	0.58	0.54	0.65	1.36	1.39	1.34	3.55	3.37	3.27
Mozambique	1.59	0.50	0.51	0.49	1.25	1.25	1.26	2.75	3.13	3.10
Zambia	2.73	0.69	0.73	0.71	1.82	1.90	1.86	5.50	5.49	5.82
Years of education of HH head ²										
Kenya	6.2	0.8	6.0	10.6	0.9	5.7	10.6	0.8	5.8	11.1
Mozambique	3.2	0.1	3.0	6.5	0.1	3.1	6.4	0.2	3.1	6.4
Zambia	6.9	2.9	7.1	10.8	3.5	7.2	10.5	3.9	7.2	10.6
Per capita household income										
Kenya	553.9	304.1	388.3	430.2	445.4	536.3	620.6	544.3	749.3	868.7
Mozambique	57.8	36.1	44.3	75.4	51.5	47.7	61.6	52.5	73.5	83.9
Zambia	122.3	72.2	102.0	209.5	84.8	101.5	167.4	101.0	116.6	176.2
Off-farm income share (%)										
Kenya	29.5	27.2	30.3	41.1	29.0	25.5	35.1	18.5	24.7	32.1
Mozambique	27.3	20.7	28.8	48.4	16.6	26.5	25.6	18.7	25.5	36.7
Zambia	28.5	26.1	35.8	52.2	19.5	24.9	35.4	16.0	21.7	29.6

Source: Kenya (Tegemeo Institute Rural Household Surveys, 1996/97 and 1999/00 crop seasons, Tegemeo Institute); Mozambique (Trabalho Inquerito Agrícola 2001/02 production season); Zambia (Post Harvest Survey and Supplemental Survey to the Post Harvest Survey, 1999/00 production season, Central Statistical Office).

Landholding terciles: Kenya (<0.94 ha, 0.94-1.90 ha, >1.90 ha), Mozambique (< 0.89 ha, 0.89-1.69 ha, >1.69 ha), Zambia (< 1.4 ha, 1.4-2.4 ha, >2.4 ha)

Education terciles: Kenya (0-3 yrs, 4-7 yrs, 8-18 yrs), Mozambique (0-1 yrs, 2-4 yrs, 5-19 yrs), Zambia (0-6 yrs, 7-8 yrs, 9-19 yrs)

Notes: 1) Landholding in Kenya refers to area cultivated; in Mozambique and Zambia it refers to total land access, including rented land.

2) Education in Mozambique computed for maximum education in the household (among individuals over 15 years).

2.6.1 Macro- and micro-level labor supply

The catastrophic death toll that is projected to occur over time in these countries has led many analysts to conclude that the disease will cause acute labor shortages in the “high HIV prevalence” countries of Sub-Saharan Africa, thus requiring adjustments in crop technologies and farming systems to less labor-intensive production techniques. Undoubtedly, the human and social costs are indeed monumental. However, it is important to take account of the momentum of underlying population growth rates when projecting the trend in future population. Demographic projections indicate that while AIDS is projected to erode population growth to roughly zero in the seven hardest-hit countries of Africa, the net result is a roughly stable number of working age adults over time (Jayne et al, 2005b). Yet the oft-mentioned prediction of a macro-level labor shortage is derived from the difference between the demographic ‘with-AIDS’ projected scenario and the ‘without-AIDS’ scenario (what would have happened in the absence of AIDS). However, this difference (‘population loss’) is considerably larger than that between the ‘present day labor force’ and the projected size of the labor force in 20 years taking into account the impact of AIDS. Thus, while AIDS-related mortality figures predict a monumental human catastrophe, they do not indicate any major decline in labor-to-available-land ratios (Table 5) and thus, in our view, do not justify the call by some organizations to alter the priorities of agricultural research systems toward labor-saving technology. As a contrasting view, analysts such as Lipton (2005) argue for technologies that are relatively labor-intensive.

Household-level findings suggest that land/labor ratios of many afflicted households are similar to those of non-afflicted households, and imply that agricultural labor may not be the principal production constraint for most afflicted households (Mather et al. 2004). Barnett et al. (1995) conclude from case study research in Uganda, Tanzania, and Zambia, that the effects of adult mortality on rural livelihoods may vary considerably across and within countries given numerous factors such as the extent of HIV infection, labor requirements of the predominant cropping system, population density, and the size of the local labor market. Recent work by Dorward (2003) uses a non-linear programming model and a household typology in Malawi to predict input and output responses to various shocks, such as price, drought, and adult illness. They find that responses to adult illness such as reduced area cultivated and outcomes such as lower yields vary considerably by characteristics of the household, such as percentage loss in household labor, income and asset levels.

Table 5. Comparison of Total Population Size for the Seven Hardest-Hit Countries, * 2000 vs. 2025

Sex/age categories		2000 estimated	2025	2025
			forecasted “no-AIDS” scenario	forecasted “with AIDS”
		----- Projected Population (millions) -----		
Males	< 20 years	18.6	22.9	16.8
	20-59 years	17.5	32.1	18.6
	> 59 years	2.1	4.7	3.2
Females	< 20 years	18.9	23.0	16.4
	20-59 years	17.7	32.6	17.8
	> 59 years	2.3	5.4	3.5

* Botswana, Lesotho, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe

Source: US Census Bureau, 2003.

2.6.2 Macro- and micro-level changes in cropping systems

Some studies have conjectured that HIV/AIDS is likely to lead afflicted households to shift towards less labor-intensive crops, such as roots and tubers. While such crops typically demand less overall labor and allow for more flexibility in the timing of labor inputs, they tend to be lower in value and nutrition than cash and grain crops. Particular emphasis has been put on the recent shift in area

cultivated from maize to roots and tubers, observed in several countries in eastern and southern Africa. While these crop shifts could be related to HIV/AIDS-related illness and death, it is important to acknowledge that recent crop and input policy changes in many eastern and southern African countries have affected the relative output/input price ratios for grain crops relative to roots and tubers, reducing the profitability in some areas of grains as compared to roots and tubers (Jayne et al., 2005b).

Using household survey data from Mozambique, Rwanda, and Zambia, Mather et al (2004) found that the *ex post* percentage of area cultivated to roots and tubers was similar among households with and without a prime-age death. While one cannot infer from mean *ex post* results alone whether or not afflicted household cropping has changed over time, the results still demonstrate that the *ex post* cultivation of roots and tubers – labor-saving crops – was not on average higher among most afflicted households, as compared with non-afflicted households. Impact analysis using panel data from Tanzania found that although some farm activities were temporarily scaled back after a male death and wage income fell, afflicted households did not shift towards subsistence crops (Beegle, 2003). Likewise, Yamano and Jayne (2004) found no significant shifts toward root and tuber cultivation in the case of death of any household member, but did find other significant shifts in cropping patterns for households within the lower half of the income distribution which suffered a household head/spouse death. For example, households with a male head/spouse death incurred a significant decline in area cultivated to sugarcane, tea, and horticultural crops, a result related not to labor shortage *per se* but due to loss of the man's land title which serves as a pre-condition to participation in outgrower schemes.

The results suggest that when gender is a main determinant of participation in an economic activity, as with many cash crops (and often with non-farm income), the loss of the participating adult (male) may leave the surviving spouse without access to the activity. Addressing the gender bias in agricultural production and marketing knowledge and opportunities (and education, in the case of non-farm opportunities) could contribute significantly to improved income potential for many households.

2.6.3 The New Variant Famine hypothesis

The New Variant Famine theory proposes that the general burden of care in both affected and non-afflicted households has reduced the viability of rural livelihoods, and reduced the resilience of rural communities to external shocks such as drought (de Waal, 2003). If true, this suggests that the non-afflicted population is not a reliable control group for examining the effects on afflicted households. Yet, this also implies that aggregate welfare indicators in the hardest-hit countries should decline over time, at least that the bottom quartile of households.

Zambia presents a reasonable test case for the NVF theory given that HIV rates are among the highest in Africa at 17 percent (1999), and has been hit by occasional droughts throughout the past decade. The micro-level survey data evidence from annual nationally-representative production data from 1990-2003 does not appear to support the NVF at this point in time. At the national level, rural per capita calories from food crops produced by smallholders was stable from 1993-1999 (Zulu et al, 2001). Looking at the 1993-2003 period, median area cultivated and area cultivated per capita increased for all households, the bottom quartile (in crop production value), and the top quartile (Govereh et al., forthcoming). While mean and median crop output value, value/capita, and value/ha are decreasing slightly among all households and the top quartile, they are increasing among the lowest quartile. However, median and mean draft livestock value is decreasing for all quartiles, a result perhaps explained by a severe outbreak of cattle disease in the mid-1990s. Mean value of farm draft equipment is increasing for all quartiles. In sum, there does not seem to be evidence, at least in Zambia, that the lowest quartile of small-scale farm households are showing declining trends in area cultivated, crop output value, or asset values compared to the early 1990s.

2.6.4 Heterogeneity of Household-Level Impacts of Mortality

Results from the emerging micro-level empirical literature question the usefulness of a homogeneous conceptualization of 'afflicted households,' especially in the context of proposals for targeted assistance and technology development. This homogenous conceptualization perhaps is a reflection of a general assumption by many that small farm households are relatively homogeneous; a proposition discredited by the heterogeneity of land/labor ratios in the general population as discussed in an earlier section of the paper.

While death of any kind undoubtedly brings hardship and suffering to afflicted households, the magnitude of the economic consequences appears to vary significantly according to the extent to which the deceased tend to be primary breadwinners and core members of the household (Yamano and Jayne, 2004), as well as the household's *ex ante* asset levels (ibid, 2004; Drimie, 2002). In addition, in contrast to the general assumption that HIV-related mortality is typically associated with household heads/spouses, Mather et al. (2004) find in four of the five countries analyzed that a majority of deceased prime-age (PA) adults were not household heads/spouses, and thus not likely to be the primary breadwinners of the household. In another example from Tanzania, among afflicted households, poorer households are less likely to receive financial assistance from social networks – as well as less total assistance when received – as compared to less-poor households (Lundberg et al., 2000).

The heterogeneity of household-level impacts found in these studies is further supported by a recent synthesis of studies using nation-wide survey data to compare selected *ex post* (1-3 years post-death) indicators of welfare for households with and without a recent prime-age death (Mather et al., 2004). The results from five countries in southern and eastern Africa show that although afflicted households may well have suffered negative effects on household crop production and income, the *ex post* land/labor ratios and household incomes of afflicted households are quite heterogeneous, the mean values of which are similar to those of households without a death. However, there are some afflicted households which appear to especially be in need of assistance, for those which have suffered the death of a household head or spouse tend to have lower *ex post* land/labor ratios and income relative to households without a death, and thus are more likely to be in poverty.

The implications of this heterogeneity are important for the design of HIV/AIDS mitigation strategies, as well as for considering the HIV/AIDS epidemic within the context of rural poverty alleviation and growth strategies. First, the evidence cited here suggests that targeting technology development or assistance to a homogeneously-conceptualized group of 'afflicted households' is not a good strategy simply because many of these households are similar in many respects to non-afflicted neighbors. In addition, given scarce donor and national funds for rural development, imposing additional constraints on agricultural technology development (such as developing an additional maize variety which saves labor through greater weed resistance or an earlier harvest) will undoubtedly involve tradeoffs between aspects appropriate for the majority of farm-households, both afflicted and non-afflicted. Perhaps a better approach is to consider that many African countries are facing a serious development crisis, driven by various trends – of which HIV/AIDS is but one -- which together are making small-holder livelihoods and welfare more and more tenuous, particularly for a subset of small-holders with low land access and education.

Social safety nets are needed to help the hardest-hit households avoid falling below minimum asset and nutrition threshold levels. The results cited above suggest that the targeting of mitigation efforts such as food aid should be based on empirical evaluation to identify those afflicted households most likely to be in need in a given country context, rather than on a homogenous conceptualization of 'afflicted households.' Yet for the majority of afflicted small farm households, perhaps the most helpful investments are what many development practitioners already consider to be 'good pro-poor development strategies': improved land tenure; labor-saving technologies for water access (village well), fuel and food processing; redressing gender bias in extension and education and thus access to cash crop and non-farm income opportunities; development and dissemination of improved food crop varieties (for yield, drought/stress, etc, depending upon the resource constraints of marginal farmers). It is important to establish whether these investments or policies are appropriate for the

needs of hardest-hit households while also benefiting other poor but non-affected households at the same time. In short, while safety nets are important for the hardest-hit households to protect their assets, investing in pro-poor agricultural productivity growth appears to be one of the most effective means to respond to the HIV/AIDS epidemic. And since resources are extremely scarce, trade-offs must be made between short-term and long-term approaches for redressing the poverty impacts of AIDS.

2.7 Farm Policies in High-Income Countries and Global Agricultural Trade Policies

The prevailing international agricultural trade policy environment is both hypocritical and not supportive of the small farm. International donors try to convince African governments of the virtues of liberalization and open markets, but then subsidize their agriculture and affect world prices for African imports and exports in the process (World Bank 2000). Are these subsidies (and the food aid generated from them) affecting the long-term competitiveness of African agricultural production and agricultural transformation?

There is widespread dissatisfaction among developing countries with the framework for international agricultural trade agreements. In particular, access to developed country markets has not been achieved to the promised extent, and many developing countries have experienced import surges following trade liberalization. Moreover, the Agreement on Agriculture appears to have been designed largely with “developed country agriculture” in mind, as it institutionalizes the production- and trade- distorting practices employed by the most powerful countries. These countries now enjoy a unique privilege among WTO members, in the sense that the agreement gives them the legal right to continue to affect agricultural markets through their production and trade subsidies.

Each year OECD countries provide roughly \$50 billion per year in development assistance, while subsidizing their agricultural production by anywhere from US\$350 to US\$500 billion per year (McCalla 2001). This is greater than the GDP of Sub-Saharan Africa (Wolgin 2001). Some of these subsidies may help African countries, such as those that are net importers of grains. Recent OXFAM and IFPRI reports draw specific attention to the need for changes in developed country agricultural policies and a more level playing field in global agricultural trade agreements to raise agricultural growth and reduce poverty in Africa and other parts of the developing world. For developed country governments and their citizenry who are truly committed to making globalization work for poor people, most of whom are in agriculture, a more serious public discussion of agricultural protectionism in developed countries and its effects on global poverty will need to be forthcoming.

The real debate on globalization is, ultimately, not about the efficiency of markets, nor about the importance of modern technology. The debate, rather, is about the inequality of power (Sen 2000). The future of the small farm in much of Africa will hinge on national and international negotiations regarding access to developing country markets for goods produced by African farmers and the international supply and price effects of multilateral trade agreements.

2.8 Donor and State Support to the Small Farm is Declining

Available evidence suggests that after several decades of strong support, international funding for agriculture and agricultural R&D began to decline in both absolute and relative terms around the mid-1980s as support for economic infrastructure as well as health, education, and other social services began to grow (Pardey and Bientema, 2001). This decline has been particularly acute in Africa, where donor assistance to African agriculture fell dramatically during the 1990's in both absolute and relative terms. From 1991 to 2002, donor aid to African agriculture fell from about USD 1.7 billion to USD 1 billion, and the share of donor aid to agriculture fell from 19 to 10 percent, while that of social services (health and education) increased from 32 to 56 percent (Kane and Eicher, 2004). Yet the role of agriculture in food security and poverty alleviation is no less important in Africa than it was in Asia's food crises of the 1960's and 1970's.

There is an abundance of literature concerning the positive and negative impacts on poverty, equity, and the environment in developing countries of Green Revolution modern rice and wheat varieties (MVs) – the technologies that embody the early decades of agricultural R&D. A review of 292 impact studies demonstrates that rates of return to agricultural research remain quite high and have not fallen over time (Alston *et al.*, 2000). Yet, favorable rates of return alone have not alleviated continued (and increasing) under-investment in agricultural R&D.

In addition, international agricultural research systems are faced with the dilemma that while funding levels for agriculture and agricultural R&D have declined in recent years, demands on agricultural research systems to develop agricultural technologies which are more sustainable, equitable, and better-targeted to marginal areas have increased. International agricultural research systems have switched from the “high payoff input” approach (Hayami and Ruttan, 1985; Schultz, 1964), based on modern varieties and the use of external inputs, to a broader concern for sustainable agriculture and technologies for marginal areas, including maintenance research and reduced reliance on external inputs (Byerlee, 1996).

What explains the decline? The sharp cutback in donor aid to African agriculture since the early 90’s can be partially attributed to donor frustration over three decades of the poor performance of many donor-financed agricultural programs (e.g., aid tied to policy reform conditionality) and projects (T&V extension, livestock ranches, and support of parastatal marketing boards).

In addition, most African governments have given low priority to agriculture and rural development. Although the conventional wisdom is that the fiscal resources available to African governments have been slashed under the burden of structural adjustment, this picture does not square with the actual figures. In a cross-country study, Jayarajah and Branson (1995) find that state revenues as a proportion of GDP declined at most one percentage point during the course of World Bank adjustment programs. Nashashibi *et al.* (1992) conclude that, after implementing macro reform policies, real government revenues went up in nine African cases and down in nine, relative to a “base year.” According to published World Bank data across Africa (excluding South Africa and Nigeria), government revenues have declined from an average of 16.3 percent of GDP during 1975-1984 to 15.8 percent from 1990-1996. Thus, while there is abundant evidence that government investment in physical infrastructure, agricultural research, and other key public goods has declined, this trend cannot be explained by severely reduced government revenues in most African countries.

Under-investment in agricultural research in Africa has had serious long-term consequences for agricultural growth. International agricultural commodity prices have declined as efficiency in production and marketing have improved in other parts of the world. Commensurate declines in production and marketing costs have generally not occurred for most important crops in Africa.

To allow incomes of its people to rise, African governments need to invest in their own agricultural R&D systems on a continuous, sustained basis. It is not clear that this point has really hit home. Many of the locally-generated national poverty reduction strategy papers diagnose the main causes of slow agricultural growth to be market liberalization, weak private sector response, declining primary commodity price trends, unfair international trade agreements, and weather disturbances. Without commenting here on the importance of these factors, the relative neglect of the importance of agricultural research is a glaring omission. While many have blamed poor agricultural performance on a declining terms of trade, to a large extent these trends are reflecting research-driven productivity growth elsewhere in the world. The key message is that government policy designed to promote the interests of the small farm and agricultural transformation would recognize that innovation and technical change must be continuous and sustained, and this requires sustained investment in agricultural research and extension systems.

Unfortunately, as with education, the benefits to investments in agricultural research accrue mainly over the long run. Governments all over the world, by contrast, tend to have short-term time horizons. Other types of expenditures of scarce public resources may provide more immediate payoffs that are of greater direct interest to governments. This situation has the classic characteristics of a social trap (Platt 1973): certain actions that are beneficial to society in the longer run remain

dormant because of insufficient short-term benefits in a world of immediate demands. A key challenge, therefore, is how to provide incentives for governments to reallocate their expenditure patterns. Second, what can be done to induce international lenders and donors to re-prioritize agriculture in their development assistance portfolios? The share of the World Bank's and USAID's development budget allocated to agriculture has declined markedly in the past 20 years (World Bank 2000; Attwood 2000). Ruttan (1996) and Mellor (1998) argue that the programming of foreign aid has been captured by myriad special interest groups, including child survival, vitamin A deficiency, microcredit, poverty, microenterprise, empowerment of women, environment, wildlife preservation, etc. Notwithstanding the importance of these activities, the question is whether these topics have shifted attention and resources away from the basic processes of growth, which will most likely start with agriculture.⁴ Deriving the tax revenue to finance these other useful investments is also largely dependent on agricultural growth.

3. Where from Here?

The co-existence of relatively low levels of small farm productivity in Africa and the availability and widespread use of technical knowledge and productivity-enhancing inputs in many other parts of the world indicates the need for attention to the barriers to the adoption of productivity-enhancing inputs in African agricultural systems. From the point of view of the individual farmer, it is clearly not a single problem or factor that describes the opportunity set. It is a system. Individuals and communities have limited capacity to deal with the circle of poverty alone. While many factors contribute to poverty, the problems in addressing poverty largely lie in the political-economic environment which structures economic incentives.

Agricultural transformation and consequently structural transformation can only be realized if players in technology generation, institution building, and policy function collaboratively and in a coordinated fashion. Policy-oriented marketing research will need to expand its emphasis from the liberalization of markets to the identification of strategies that will give the incentives to invest in new productive patterns of investment and exchange for the millions of low-input semi-subsistence rural households in the region. This implies a major role for future research in identifying organizational arrangements that can concentrate the technical and management know-how, capital and financing, labor, and connections to local and international markets on the small farm. Outgrower arrangements and farmer cooperatives are two such organizational forms that have tried, with varying levels of success in the past (Dorward, Kydd, and Poulton 1998). Notwithstanding their mixed history, we feel that it is likely that the future of the small farm will greatly depend on whether farmer-driven organizations (variants of cooperatives or outgrower companies) can succeed in overcoming past difficulties so that their theoretical benefits can be achieved in practice. The need for group coordination seems clear when considering how the majority of small farms in Africa — working as individual units — can reasonably be expected to acquire the financing required for input purchase, cutting edge technical production know-how, the market clout to access domestic and international markets on favorable terms, and the political voice in domestic politics to garner some influence over public resource allocation.

These solutions will be fundamentally country-specific, dependent upon the current set of market rules, property rights, exchange arrangements, experience and perceptions derived from history, and organizational structure in each country. Promising areas for future research involve how to create the incentives, through attention to the institutional underpinnings of markets, for coordination between farmer organizations (accountable to farmers), multinational input and commodity trading firms, a supportive public sector, and an expanded role for commodity exchanges, forward contracting, and other mechanisms to reduce the costs and risks of investing in the entire

⁴ Mellor (1998) argues that there was some justification for these special interests in Asia, particularly after the green revolution succeeded in stimulating growth and incomes, "which spawned a legitimate concern for second generation problems—of women, children, and the poor, and of environmental enhancement...But Africa never had the first generation solutions. Indeed, the quest for second-generation solutions has stood squarely in the way" (p. 40).

food system. Finding workable strategies to implement these scenarios is likely to be the key challenge facing the future viability of the small farm in Africa well into the twenty-first century.

Increased commitment to agricultural science and technology development appropriate to small farm and semi-arid conditions is likely to be crucial. Lipton (2005) and Bagwati (2005) propose performance contracts between donors and international seed companies to achieve specific outcomes, such as developing hybrid maize varieties profitable over a range of stated areas and conditions. Such innovations may help re-focus the priorities and energies of the private agricultural research industry, which currently may not see the commercial incentives to focus on small, low-income farmers with little effective demand.

Given the existing distribution of landholding sizes within the small farm sectors of eastern and southern Africa, land reform or land redistribution may need to be on the agenda. Farmer organization can help to some extent to overcome dis-economies of scale associated with small farmers' attempts to acquire inputs and marketing output. However, the evidence suggests that farm size within the small farm sector is continuing to gradually decline with modest population growth and the closing of the land frontier in many parts of the region (Jayne et al., 2003). The bottom 25% of rural agricultural households are virtually landless, having access to 0.10 hectares per capita or less in each country examined. Under existing conditions, the ability of this bottom land quartile to escape from poverty directly through agricultural productivity growth is limited by their constrained access to land and other resources. Viewed in a static way, one could conclude that the only way out of poverty for the severely land-constrained rural poor is to increase their access to land. Viewed within a dynamic structural transformation framework, this group's brightest prospect for escape from poverty (which is by no means a sure thing) is likely to involve being "pulled" off the farm into productive non-farm sectors. Abundant evidence of the transformation process elsewhere indicates that growth in non-farm sectors typically starts from a robust stimulus to agriculture, which generates rural purchasing power for goods and services. For many African countries, this implies increased crop productivity in order to increased household disposable income for non-staple crops and consumer goods. During this process, there will be high payoffs to education, as the most highly skilled households have the best access to the well-paying non-farm jobs. Therefore, while greater equity in land holding and increased food crop productivity is critical to rural poverty reduction in the short run, an important long run goal may be to enable the rural poor to access skilled off-farm jobs through investments and policies that support the processes of structural transformation. Education, which played an important role in Asia by allowing households to exit agriculture into more lucrative off-farm jobs, is relatively low in most areas of rural Africa by world standards. Investments in rural education and communications are likely to become increasingly important to facilitate structural transformation.

Even though the AIDS crisis requires immediate action, dealing with the disease in the most cost effective way will require much more research on how alternative interventions affect rural household behavior, under the range of different farming systems found in eastern and southern Africa. At the moment, there is very little knowledge to guide how donor organizations should balance their efforts between mitigation strategies targeted at highly-affected communities vs. long-term pro-poor growth strategies such as investments in agricultural science and technology, extension systems, education, and market development.

For the majority of afflicted small farm households, perhaps the most helpful investments are what many development practitioners already consider to be 'good pro-poor development strategies': improved land tenure; labor-saving technologies for water access (village well), fuel and food processing; redressing gender bias in extension and education and thus access to cash crop and non-farm income opportunities; development and dissemination of improved food crop varieties (for yield, drought/stress, etc, depending upon the resource constraints of marginal farmers).

Strategies to link African farmers to markets must take account of the inequality in productive assets and low crop productivity, which contribute to highly concentrated patterns of agricultural surplus generation within the smallholder sector, and to the constraints on household diversification into higher-value crop production imposed by food market instability. Yet the issue of how to stabilize

food markets and prices are transcended by issues of governance. The aims of promoting producer and consumer welfare can be promoted – in principle – through either direct government operations or through private trade. In actual experience, neither approach has worked very well. Effective governance is central to the effective operation of both state enterprises and markets. Marketing boards have a mixed track record in Africa. But attempts to rely on markets, given a chronic under-provision of public goods investments, often fail too. The evidence seems clear that, without increased government and donor support for public goods investments to drive down the costs of production and marketing, the future for smallholder farms in Africa is not good. But such investments will also need to be complemented by a policy environment that acknowledges the extreme concentration of marketed staple food output and the possibly anti-poor effects of policies concentrating on transferring benefits to staple food sellers rather than investing in market institutions and infrastructure that promote a broad range of crops, including those likely to be more important for cash incomes on very small farms.

Lastly, we underscore the importance of an honest and open treatment of the behaviors of both donor organizations and governments in high-income countries that currently compromise the effectiveness of development assistance. While these problems are thorny indeed, a more honest discussion is the first step toward tackling them. Failing to address them will simply prolong the problem. Given the general agreement that much larger financial commitments will be necessary to achieve a long-term growth path for African agriculture and its allied sectors, education and health, it will be crucial to develop the conditions for more effective absorption and use of development assistance (Bagwati, 2005). Reform is required of both donor and local governments, as well as the international trade environment. This will certainly require enlightened leadership on all fronts, with the honesty to be frank about the incentive problems, and the political will to overcome them. In such a political environment, there would be reason to be strongly optimistic about the potential for the small African farm, as well as for the emerging interdependent social and economic systems in the rest of the world.

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Appendix 1: Notes on the National Rural Household Datasets

Kenya: Analysis is based on survey of 1,578 small-scale farming households surveyed in 1997 and re-surveyed in 2000. The survey was designed and implemented under the Tegemeo Agricultural Monitoring and Policy Analysis Project (TAMPA), implemented by Egerton University/Tegemeo Institute, with support from Michigan State University. The sampling frame for the survey was prepared in consultation with the Central Bureau of Statistics. First, 24 districts in the nation's 8 agriculturally-oriented provinces were purposively chosen to represent the broad range of agro-ecological zones and agricultural production systems in Kenya. Next, all non-urban divisions were assigned to one or more AEZs based on secondary data. Third, proportionally to population across AEZs, divisions were chosen purposively from each AEZ. Fourth, within each division, villages and households within selected villages were randomly selected. We excluded from this analysis two pastoral districts (40 households) that differed substantially from other zones and had high rates of attrition. Of the 1,538 remaining households that we attempted to revisit in the 2000 survey, 1,460 households in six provinces were located and re-interviewed, and these households form the basis for analysis in this paper.

Mozambique: In 2002, the Mozambican Ministry of Agriculture and Rural Development (MADER) in collaboration with the National Institute of Statistics (INE) conducted the Trabalho do Inquerto Agrícola (TIA) survey. The sampling frame was derived from the Census of Agriculture and Livestock 2000, and was confined to small- and medium-scale farm households. The sample was stratified by province (10 provinces) and agroecological zones. Eighty of the country's 128 districts were included in the sample. A total of 4,908 small and medium-sized farms were interviewed in 559 communities that were the primary sampling units. The sample is nationally representative of rural farm households to the provincial level.

Zambia: The Post Harvest Survey of 1999/2000 and the linked 2001 Supplementary Survey (SS) to the Post Harvest Survey, both conducted by the government's Central Statistical Office, are the basis for the Zambia data reported in this paper. The sample is considered nationally representative of small- and medium-scale farm households to the provincial level. The PHS/SS is based on a sample frame of about 8,000 small-scale (0.1 to 5 hectares) and medium-scale farm households, defined as those cultivating areas between 5 to 20 hectares. Large-scale farmers are not included in this survey. Households were included in the sample only if they were found through initial screening questions to cultivate crops or raise livestock. Because the PHS is an agricultural household survey, by definition, the sample contains no landless households.

Ethiopia: The data come from two sources: the 1995/6 Annual Agricultural Sample Survey (ASS), fielded by the Ethiopian Central Statistical Authority (CSA) and the Food Security Survey (FSS), fielded on a subset of ASS households in 1996 by the CSA and the Grain Marketing Research Project. The 1995/6 Agricultural Sample Survey uses the same frame of enumeration areas (EAs) as used to conduct the 1994 Population Census. Some 615 rural EAs in 373 weredas are sampled out of roughly 60,000, with probability proportional to population size. In each of the EAs, 25 farm households are randomly selected, for a total of 15,374 households. Out of these, 7 are randomly sampled to be in the Food Security Survey, some 4,112 households total.

Discussant Remarks

Marcela Villarreal, Director, Gender and Population Division, FAO Focal Point for HIV/AIDS, Sustainable Development Department, UN Food and Agriculture Organization (FAO), Italy

Both papers present the difficulties faced by smallholder farming while recognizing heterogeneity in characterizing small farmers. This morning the issue of heterogeneity has come up several times, and it is quite important. It comes up often in Jayne, Mather, and Mghenyi's paper. In addition, they talk about the adverse effects of conflict. Both presenters touch on the issue of systemic interactions, which I would have wanted to see further elaborated. Thom Jayne brings up the interactions between rural and urban issues, a point worth developing more, and he touches on worldwide systemic interactions such as subsidies. Both speakers propose the role of agricultural investment, including in infrastructure and agricultural research and extension. Ruerd Ruben talks about asset building, diversification, and, as we heard over and over this morning, reducing risks and transaction costs. Both talk about institutions and about the importance of access to knowledge and education.

However, Ruben does not address issues of small farms. He focuses on issues of less-favored areas. He does not touch on the size issue of smaller or bigger farms, and therefore he does not really address the main issue for the discussion today. In addition, I found that his policy suggestions are not really specific to the problems of those less-favored areas that he describes at the beginning of the paper.

The Jayne, Mather, and Mghenyi paper talks about small farms, including their viability and their internal composition. I think that gives us a better understanding to advance the policy issues. Some small farms are doing well selling to supermarkets, while other small farms are at the brink of breakup and probably at the brink of disintegrating and even disappearing. The problem with lots of the HIV/AIDS research is that it is the most affected households that disintegrate, and therefore cannot be included in surveys and studies. Those who have suffered most the shock of HIV/AIDS are simply not there to tell the story. There are threshold levels in certain variables that determine the point at which a household cannot continue to be viable. Other thresholds may need to be reached for it to survive or to come out of poverty. Threshold analysis should probably give us guidance regarding policy implications. I would like to have seen that discussed a little bit more in both of the papers.

What is the capacity of a household to be capitalized? That is, what is its capacity to absorb knowledge (for example, the capacity to absorb research technology transfer or agricultural extension teachings)? What are the factors that put it at more or less at risk, very specifically? Apart from the composition of the household, for example, what is its history in shocks? Has it been accumulating different kinds of shocks? What is the dependency ratio? Are we talking about, for example, small farms led by a woman head of household who has become head of household because she has recently been widowed? This morning, the issue of property rights was broached several times, and I would like to emphasize: what is the impact of the lack of property rights on the future of rural and small farms? We have a very, very unequal distribution of assets, of property, of the means of production between men and women. What is the impact not only on rural women, but on the viability of rural development?

Then, of course, both papers address HIV/AIDS as a major factor affecting the viability of smallholders in Africa. HIV/AIDS has a direct impact on agriculture, food security, and rural poverty in Africa, an impact that will hopefully never materialize in other regions such as Latin America. In Latin America HIV/AIDS is concentrated basically in the urban areas and, at levels of less than 1 percent prevalence, it is unlikely to ever have a significant effect on rural development. However, in countries such as Swaziland, where the latest survey results say that 42 percent of the adult population is HIV-positive, it will have a huge impact on all aspects of society, now and in years to come.

HIV/AIDS can push viable households into unviability and this is probably even more true for small farms, which depend much more on the availability of labor at very specific moments of the production cycle through the year. Jayne, Mather, and Mghenyi's graphs show that the impacts on the size of the labor-force are not going to be huge. However, there is going to be a very significant impact on specific groups of the population, very specifically the poor smallholders, who depend

strongly on labor availability. There will probably be enough labor—non skilled labor—available for commercial agriculture. That is probably not going to be an issue because of the dynamics of population growth. However, small farms will feel the impact of labor loss very, very strongly. Therefore, in that sense, and for those groups, labor-saving technologies become essential to mitigate the impact of AIDS.

Returning for a moment to the issue of property rights, I think their importance cannot be overstated. In many parts of the AIDS-affected countries in Sub-Saharan Africa, half of the society owns the totality of the means of production. The men own them, and women have access to them only through marriage ties; if the marriage is over because a man dies, the widow is supposed to marry one of the brothers of the deceased, and she will continue to have access to the productive assets. This is supposed to be a traditional safety net. In AIDS-affected areas, widows are being ejected from this traditional safety net just because of fear of HIV/AIDS. They are left destitute without any assets—land, tools, or inputs. So in a way, they are forced to engage in risky sexual behavior in order to get access to these and to food. It is not only the women who are vulnerable. The totality of society becomes vulnerable because of women's lack of property rights; it eventually affects everybody, putting the risk in the totality of society. Jayne, Mather, and Mghenyi say poverty is one of the driving forces of HIV/AIDS. I could not agree more. But gender inequality in access to and ownership of means of production make up another of the many driving forces. That hasn't been taken into account in policies.

Regarding food aid—another aspect covered by both papers, I do see that there is pure danger in major donors trying to focus on food aid for the AIDS-affected groups. In some cases, food aid is necessary, and we have to accept that. Without food, people under the shock of AIDS simply cannot participate in any kind of development process. But food aid must be linked with longer-term interventions for food security development.

Investment in Agriculture

Both papers talk about investment in agriculture—this investment is essential, specifically for small households that depend on agriculture for their survival. But the interest should be in what investment is necessary to successfully reduce poverty. For that, we have to understand much better what are the factors of vulnerability that make these households more marginalized. This morning, Prabhu Pingali mentioned subsidies that enable small farmers and have a very big impact.

We have to move away from the conceptualization that agricultural growth is competing with social development. More and more, we have evidence that health and education are essential components of economic growth and therefore should be part and parcel of agricultural investments. We have to make sure that we address the process of vulnerability, and therefore, that we increase resilience, and not only through food aid, as I said before, but through insurance. For example, nobody will give credit to people who are going to die within two years of AIDS. We have found innovative ways of getting credit to AIDS-affected communities, for example, giving it to two or three people instead of an individual, so if one dies the others will continue payments. Innovative credit schemes should be explored further. And much more should be invested in knowledge systems—education, yes; agricultural technology, yes; but also traditional knowledge, and very much so by including the community.

Urbanization

We should consider urbanization as part of the strategy to help out some of the small farms. Look at countries like Burundi or Rwanda—they are the two most rural countries in the world at 92 and 93 percent of rural population. Fertility rates are between seven and eight children per woman. Land cannot be sub-divided further. The options available are to engage in urbanization or to kill each other. We know what happened. Urbanization can act as a safety valve for the viability of rural areas.

Institutions

Both papers talk about the importance of institutions. This cannot be overstated: institutions are absolutely fundamental. But, again, what is also fundamental is the conceptualization of what institutions are. Very specifically, we have to consider a broad approach to institutions, both formal and informal—not only to the ones that are typically targeted by the development community, but also to traditional institutions that represent a set of rules, norms, and values that govern human interaction and the issues I mentioned earlier, such as spouse inheritance, property rights, and safety nets. Institutions have to understand gender relations and engage the private sector. That should be addressed in a very formative way.

Discussant Remarks

Sukhadeo Thorat, *Professor of Economics, Center for the Study of Regional Development, School of Social Science, Jawaharlal Nehru University, and Director, Indian Institute of Dalit Studies, India*

Both papers try to discuss the situation of small farmers in less-favored or difficult circumstances at the aggregate level without farm-size-wise analysis. They offer no comparison of the problems of small farmers vis-à-vis large farmers. Jayne, Mather, and Mghenyi, however, offer some information, particularly on cropping patterns and market involvement for the sale of products. The area-level analysis in both papers is quite useful and sheds light on the problems of farmers. Both papers also make good suggestions.

Both papers argue that the problems of less-favored farmers are common to other areas in Africa in some respects. However, those problems differ from those in other regions insofar as the farmers in the regions face variability, vulnerability, and unsustainability due to low and uncertain rainfall and soil erosion. So farmers face variability and risk in production. The farmers in those areas generally use traditional inputs; there is no significant technological breakthrough. Therefore, the return on land capital and labor is low. Agriculture remains stagnated. In addition, both papers observe that the supportive institutions—such as marketing institutions and credit institutions—are weak and ask also whether insurance institutions and other mechanisms are lacking. The diversification of employment in favor of the nonfarm sector is very low, primarily due to the lack of education and skills and because of health problems. HIV/AIDS has created an additional problem of labor supply in selected areas.

Both papers agree that the sheer size of the small farm sector favors policies for that sector. Both papers, particularly Ruben, suggest soil and water conservation measures to enhance sustainability and the use of technology to reduce variability. But that requires more public investment, collective action, and community organization. Is there such social capital in African society? Both papers suggest the development of crop technology suited to agroclimatic conditions where rainfall is low and uncertain. This, too, requires a high level of public investment in the development of crop technologies, which is a major challenge. The papers suggest developing market institutions related to credit, insurance, and inputs. My suggestion is that such institutions will have to be of a nature that can meet the problem of variability. In that case we need state interventions in terms of production for prices and supply of inputs, including food. Finally, both papers propose diversification of economic activities and employment through education and health measures.

Session 3

Summary of the Open Discussion

During the discussion, one participant emphasized the need to acknowledge the critical importance of climate change and its effect on small farmers. He offered an example of the three million Kenyan tea growers who operate 400,000 small farms, constitute 10 percent of the population, and produce about 60 percent of Kenya's tea. Those farmers, he argued, will be compelled to cut their production in half when the projected 2 degrees Celsius warming occurs. Although those and many other smallholders are not currently classified as marginal, they will become a part of that group unless action is taken on climate change. Another participant brought to the audience's attention the property rights situation for women farmers and the effect that their absence has on the women's income levels. To illustrate his point, he cited research done in Kenya that suggests a strong negative impact of a death of a male head of household on the agricultural production, asset levels, participation in outgrower schemes, and nonfarming activities of that household. The loss of land is part of the reason for the negative effect, since women cannot retain title to it. Yet another participant proposed examining the ethical and human rights dimension of the small farms issue, given that these units depend on the uncompensated labor of women with limited rights and children who should be in school. In addition, a closer focus on the issue of migration out of rural areas and its impact on existing social networks was suggested.

Addressing the needs of smallholders in difficult circumstances was recognized as a particularly challenging task. Well-targeted subsidies were proposed as one of the solutions. However, one of the speakers, Thom Jayne, cited research showing that subsidies are not always well distributed even among the smallholders.

Public sector investments in agriculture and other sectors, especially in infrastructure, water, and human capital, were all advocated as necessary measures to improve the welfare of small farmers in difficult circumstances. It was also proposed that the notion of the burden of disease be expanded beyond HIV/AIDS to include other diseases—such as malaria, tuberculosis, and hepatitis C—that devastate rural families.

Ways to reduce vulnerability of small farmers in less-favored and marginal areas were also analyzed during the discussion. Some participants emphasized in this regard the tremendous role of livestock and dairy income to sustaining a smallholder household. It was noted that the loss of livestock has been found to be a major factor pushing small farmers into poverty. On the other hand, as another participant underscored, livestock can be an important asset to support household security and help the household withstand various shocks.

Session 4
Employment, Migration, and the Nonfarm Economy

Small Farms, Livelihood Diversification, and Rural-Urban Transitions: Strategic Issues in Sub-Saharan Africa

Frank Ellis, Professor, Agricultural Economics, School of Development Studies, University of East Anglia, U.K.

1. Introduction

Of course, small farms have a future. In Sub-Saharan Africa excluding South Africa, most farming is small farming, and most rural populations are engaged to varying degrees in small farming as one component of diversified livelihoods. So no one would argue that improving the performance of small farms should be off the agenda for poverty reduction in Sub-Saharan Africa.

Nevertheless, the persistence, and even deepening, in Sub-Saharan Africa of a type of small farming that is getting smaller all the time and that demonstrates an even greater orientation toward low-level subsistence than was the case 20 or 30 years ago should be of great concern to all those working on poverty reduction objectives in the continent. The dynamics of small farming in Africa are poorly understood and are not captured satisfactorily by the economic models that predict fantastic income and growth multipliers from yield growth in agriculture. Much of rural Africa is sliding into greater vulnerability. The slightest disturbance in the normal rhythm of the seasons causes quite disproportionate food security crises to arise in pockets here and there or more widely across zones and countries, not to mention the “vulnerable groups,” who more or less permanently require social protection in order to avoid falling into the abyss.

Several arguments need to be developed, and this paper will attempt to sketch out some of these arguments and link them together to provide a broader picture of the dynamics of what has been occurring, and continues to occur, in Sub-Saharan Africa. This might then provide a platform for developing some testable hypotheses that could take debates about growth and poverty reduction in Sub-Saharan Africa in new directions. First, Sub-Saharan Africa in the early 21st century is not Asia in the 1970s, and this needs to be well understood since otherwise invidious and unhelpful comparisons are made concerning the ability of Sub-Saharan Africa to replicate the Asian experience. Second, and closely related, the structural adjustment program (SAP) recipe for regenerating agriculture in Sub-Saharan Africa broadly failed to do so, and a more explicit recognition of this by some of those who leaped so zealously on the SAP bandwagon as it rolled through the 1980s and 1990s would not, on occasions, go amiss. Third, the diversification out of agriculture, which is such a strong feature of farm-family livelihoods in many SSA countries, contains several paradoxes that are worth exploring for what they can tell us about potential routes out of poverty in Sub-Saharan Africa. Fourth, the slow pace of rural-urban transition in many SSA countries over the past 40 years is part of the composite picture of stalled overall growth and agricultural failure, and this must be brought into the strategic picture, too.

In recent years, there has been quite a resurgence in what might be termed the “agriculture optimist” stance on poverty reduction in Sub-Saharan Africa. This stance refers to replicating the Asian Green Revolution in Africa; it is prone to specious generalizations of the kind that say “everywhere and in all history agricultural growth has been a prerequisite for the transformation of national economies”; and it ascribes fake scientific accuracy to the agricultural research investment and growth linkage multipliers in low-income countries that are published from time to time in the academic literature. The agriculture optimist tends to see livelihood diversification as emerging from agricultural success: agriculture as the driver of nonfarm opportunities in rural areas.

The opposing view taken in this paper is that of the “agriculture skeptic,” who would tend to be dubious about most, if not all, those propositions. The agriculture skeptic is more likely to see diversification as responding to the failure of agriculture under any reasonable yield growth scenarios to generate sufficient secure livelihoods for those who currently live, and in the projected future will be living, in rural areas of Sub-Saharan Africa. The agriculture skeptic considers that there are certain problems about agriculture in liberalized markets that are substantially underestimated by the agriculture optimists, as are trends of declining farm size in many densely settled small farm rural areas.

Nevertheless, it is worth emphasizing that from a poverty reduction policy point of view, neither of these positions should be taken as absolute. Seeking to raise yields and outputs in small farm agriculture has a valid place in contemporary poverty reduction strategies in Africa. However, it will only make a contribution. It cannot single-handedly provide the “motor” of poverty eradication in Sub-Saharan Africa. Accelerated rural-urban transitions will be required as well.¹

2. The Asian Green Revolution and Other Stories

The appeal to the Green Revolution in Asia in contemporary debates about the potential for small farm agriculture in Sub-Saharan Africa is one of the least satisfactory narrative ploys around at the moment. At a trivial level, it seeks to rewrite history as if Sub-Saharan Africa were somehow bypassed by the energy and excitement and debates that surrounded the introduction of high-yielding crop varieties in Asia and Latin America during the 1970s. This is simply not true, as any amount of the literature of the period would attest. Agricultural researchers, agronomists, and economists were just as enthusiastic about this potential in Africa as elsewhere, but uptakes and outcomes were disappointing. True, this may have been in part due to the particular crops—wheat and rice—that excelled in Asia and that have always constituted a much smaller proportion of area and output in Sub-Saharan Africa.

However, the reasons for relative failure were much more complicated than this (and still are) and spawned a huge literature and subsequent endeavor to overcome the constraints. One response was the development of farming systems research approaches to yield increases in African agriculture, giving explicit recognition to the crop interdependencies in farmers’ fields, the goals of farmers themselves in terms of food security and consumption preferences, and the need for experimenting with new technologies in farmers’ fields rather than just in research stations (Byerlee and Collinson 1980; Collinson 1981). The ability of farmers themselves to adapt technologies also received much attention in that era (Richards 1985).

A considerable literature of the 1980s recognized critical differences between African agriculture and the rice and wheat farming systems of south and Southeast Asia, especially with respect to risk and on-farm diversity (Chambers 1983; Chambers, Pacey, and Thrupp 1989). Then there was the rise of the participatory movement toward the end of the 1980s, which guided much policy and practice in the 1990s and which contained within it variants specifically oriented toward farmer participation in agricultural research and the spread of new technologies (e.g., Farrington and Martin 1988). The 1980s and 1990s saw a continuous stream of agronomic ideas and innovations designed to improve the performance of SSA food production systems under differing agro-ecological conditions. Rather than painting Africa out of the picture in the 1970s and then suddenly bringing it back in the 2000s, the real position has been one of relentless endeavor by those engaged professionally in these issues to overcome the “difficulties” of achieving sustained farm yield growth in Africa.

Importantly, these points mean that new efforts are not starting from scratch; they are merely lending additional impetus to a struggle that has been going on continuously for the past 30 years. This also means, of course, that the likelihood of achieving a major breakthrough is quite low. Many, many avenues for raising farm productivity have already been explored in Sub-Saharan Africa, and the scope for a sudden uplift from previous slow progress is likely to be much smaller than is being suggested in some quarters nowadays.

A fundamental distinguishing factor is that the Asian Green Revolution was predicated on comprehensive agricultural support policies that have been discouraged and dismantled in the postliberalization dispensation originating in the structural adjustment policies of the 1980s and 1990s. In those days, there were fixed prices, floor prices, buffer stocks, fertilizer subsidies, credit subsidies, and public irrigation schemes, all paid for by the state or by donors. Few of these policy instruments remain available in the current lexicon of acceptable public sector interventions in rural areas. This is an essential difference that is rarely addressed by those currently advocating the agriculture-led growth route to poverty reduction in Sub-Saharan Africa.

¹ This paper steals shamelessly from several unpublished pieces written by the author in the past two years (Ellis 2005; Ellis and Harris 2004). Some of its ideas also appear in Bahiigwa, Mdoe, and Ellis (2005).

Indeed, if one were to compare and contrast more systematically the differences between the “success” of the 1970s Green Revolution in Asia and the prospects for achieving the same in Africa, the following points would all be relevant. First, the following features broadly characterized the Green Revolution in Asia in the 1970s:

- large, food-deficit countries seeking to achieve food self-sufficiency in the face of unreliable international grain markets;
- rising real food prices, both internationally and in domestic markets beginning to undergo rapid urbanization and industrialization;
- a vast array of agricultural policies, including fertilizer subsidies that in some countries lowered prices to 25 percent of their international level and were sustained for 10 or more years; and
- massive irrigation investments that were borne entirely by national governments at no cost to the beneficiary farmers.

Second, these features may be contrasted with parallel ones that describe the dominant circumstances or trends in Sub-Saharan Africa in the 2000s:

- often quite small domestic markets that already veer unevenly between minor surpluses, causing uneconomic returns to farmers, and minor deficits, causing price hikes and food insecurity for the most vulnerable;
- continuously declining real-world agricultural prices transmitted to domestic markets through trade liberalization and globalization;
- the absence of state-led agricultural support policies and input subsidies, with these being replaced post-market liberalization by fragmented and scattered efforts by international and national nongovernmental organizations (NGOs) to provide credit and farm support services; and
- after market liberalization, increased output price risk, uneven market coverage by private traders, spatial price variations reflecting poor market integration, and high price instability.

This paper returns to the impacts of liberalization in Sub-Saharan Africa in due course. In the meantime, some of those other stories about agriculture’s essential role in economic transformation need to be interpreted quizzically. The history of Western Europe, for example, does not remotely parallel that of modern Africa. Feudalism created city states and market towns that provided nonfarm markets for peasant outputs and nonfarm occupations for previous rural dwellers. Later, in some countries, consolidation of landholdings took place (e.g., the “enclosure” movements in England) that threw the peasantry off the land and created larger farm-size structures than occur in modern Sub-Saharan Africa, while also massively accelerating the movement of populations into towns. The customary mechanism of intergenerational land transfers in Africa that results in continuous farm subdivision at inheritance are not widely replicated in other places historically. The “role of agriculture in industrialization” question that exercised classical economists and strategic thinkers in the 19th and early 20th centuries referred to emerging large nation-states, often at war with each other (hence, food self-sufficiency was an important strategic objective in its own right), in a period when free international trade was in its infancy compared with the globalization that has emerged over the past 50 years.

A proposition that this paper advances, and which is taken up in more detail in due course, is that in learning lessons from history, it is human mobility that is possibly the most powerful factor that is present in all experiences of rapid economic change. Indeed, there may be a serious flaw in the notion, prevalent in development policy and practice for the past two decades, that the best way of addressing poverty is to support poor people at their static residential location. Rather, a more useful approach may be to build on those places in the national economy where growth is most evident, ensuring that infrastructure, transport, communications, and skills are available to contribute to that

growth process wherever it occurs. However, we jump ahead; more first on the tribulations of being a farmer in contemporary Sub-Saharan Africa.

3. The Failure of SAPs and Seriously Adverse Factors in SSA Agriculture

Certainly, at the time, one of the reasons that was considered to be fundamental to the failure of Sub-Saharan Africa in achieving its own Green Revolution was the policy environment prevailing in the 1970s—specifically the preeminence of rapacious marketing boards (“crop parastatals”), which artificially widened the marketing margin between farm gate and sales prices, extracting surpluses from the rural economy and immiserising farmers (Bates 1981; World Bank 1981). Trade and exchange rate policy did not help either, depressing import and export parity prices via overvalued exchange rates and overtaxing export commodities to the further detriment of producers. A massive research endeavor sought to demonstrate that agricultural public policy in Africa was detrimental to farm prices and to agricultural development (Krueger, Schiff, and Valdés 1991; Mellor and Ahmed 1988).

Structural adjustment programs were supposed to change all that. Reluctant governments were pressured, through the threat of withdrawal of structural adjustment loans, to eliminate fertilizer and other input subsidies, disband crop parastatals or open them up to private sector competition, eliminate fixed prices or floor prices, reduce export crop taxes, reduce nontariff import barriers and import taxes, devalue currencies and move to market exchange rates, and facilitate the emergence of competitive private trade in rural areas. Most governments acceded in the end to most of these requests, although often with a lot of foot-dragging and leaving remnants of old regimes still in place, as they still are to this day (see, for example, Cooksey 2005).

The effects of all this on farm incomes and outputs should have been measurable, dramatic, and wholly positive. That it palpably had more mixed, and even detrimental effects, is a phenomenon worth attempting to disentangle. Many of the adverse effects were probably to do with shocks and sequencing. Currency devaluation and fertilizer subsidy removal tended to be in the vanguard of policy change and happened very suddenly. The size of devaluations required immediate counteracting measures of monetary and fiscal discipline to prevent spiraling inflation. Inflation by itself almost immediately cancelled out the beneficial effects of devaluation on real farm prices, while monetary tightening caused several-fold increases in interest rates, severely curtailing farmers’ ability to take on loans. Fertilizer prices doubled or tripled practically overnight, resulting in all but the wealthiest farmers ceasing to use them at effective levels (or at any level at all).

Meanwhile, through the 1980s and 1990s, internal market liberalization took place in conjunction with trade liberalization in an era of falling real prices of agricultural commodities in world markets. This further reinforced a backdrop of downward underlying price pressures rather than the buoyant real trends predicted by the soothsayers of liberalization. Private traders failed to rush into the spaces left behind by receding parastatals. For one thing, they were no doubt still impeded and inhibited by petty barriers to entry and trade kept in place by officialdom (licenses, taxes, roadblocks); also, the cost-benefit ratio of collecting half a pickup truck of maize from a remote village at the end of a terrible dirt road hardly made commercial economic sense.

In some ways, the great liberalization thrust of the mid-1980s occurred too late to overcome the pathological conditions in SSA agriculture that had been set in train during the epoch of the parastatals. The unreliability of markets in the parastatal era (often farmers were never paid for the crops they delivered or were paid months in arrears, in addition to the low real prices that they obtained for crop sales to public purchasing agencies) resulted in a deepening “food security first” subsistence rationale that the upheavals of liberalization merely reinforced. If a farm family cannot depend on being able to purchase food at affordable prices during the lean season, then it makes good sense to retain as much production as required to ensure annual food security. The outcome is little exchange in the rural economy, little cash in circulation, and unpropitious circumstances for economic dynamism of any kind.

Lest the reader consider that this point is unduly exaggerated, reference can be made to the findings of livelihoods research conducted in the Livelihoods and Diversification Directions Explored by Research (LADDER) project of 2001–2002 in Uganda, Kenya, Tanzania, and Malawi (Ellis and

Freeman 2005).² Some of the evidence on the physical output share of various food crops retained for home consumption rather than sold in the market for sample farm households is reproduced in Table 1. It can be seen that subsistence shares are routinely above 70 percent and can, under certain circumstances, reach near 100 percent (maize in Malawi). These are average figures for the whole sample; if disaggregated by relative per capita income levels, the poorest half of the sample exhibits near total nonengagement in the market for its main food crop outputs. This is rural Sub-Saharan Africa in the 21st century.

Table 1. Output Share Consumed by Households, Selected Crops (LADDER Project)

Crops	Kenya n=350 (%)	Uganda n=315 (%)	Tanzania n=350 (%)	Malawi n=280 (%)
Bananas		73.2		
Maize	90.0	57.9	77.8	96.8
Rice			60.5	48.2
Millet	95.1	82.4		
Sorghum	89.1		60.1	
Beans	81.8	65.7	59.2	79.2

Source: LADDER Project sample surveys conducted in 37 villages, 2001–2002 (Ellis and Freeman 2004).

A liberalized agriculture in Sub-Saharan Africa confronts other difficulties that are ignored or downplayed by the enthusiasts for agriculture-led growth strategies. Free agricultural markets are inherently unstable. This used to be one of the first things taught to first-year undergraduate agricultural economics students, accompanied by the lurid spectacle of the “cobweb theorem,” which under certain elasticity conditions produced ever greater price fluctuations in successive production cycles.³ It was that inherent instability, and the routine ruin of farmers to which it gave rise, that provided the economic logic underpinning the ubiquitous farm support policies that were put in place in the industrialized countries from early in the 20th century (politics and national security also played their parts) and that are still in place to this day. Most large Asian countries still implement floor prices to limit the downside of price instability, while post-SAP Sub-Saharan African countries do not.

While on the subject of agricultural markets, national market size is a factor rarely given sufficient attention in agriculture-led growth scenarios. Most SSA countries are more or less self-sufficient in their staple foods in normal years, such that an above average harvest depresses farm prices and returns to farmers, while a below average harvest leads quickly to food security difficulties for the most vulnerable. The assessment of relative self-sufficiency is, of course, complicated by routine import levels and by food security operations in those countries that require food safety nets in most years. Nevertheless, it is quite difficult to see where the two- to threefold increases in yields sought by the agriculture optimists could be absorbed. SSA countries hardly possess a competitive edge in world food markets (remoteness and quality being key considerations). Limited domestic markets result from the slow pace of urbanization in many countries, a topic to which this paper returns, as well as from poor overall per capita income growth in quite a few countries. The idea prevalent in some quarters that new high-value export crops (e.g., vegetables, flowers) can somehow ride to the rescue is laughable given the very few farmers who can, in practice, be absorbed in such ventures.⁴

Finally, when considering the scope and limits of agriculture-led poverty reduction in Sub-Saharan Africa there is the ubiquitous phenomenon of declining farm size. This trend tends to be left out of the economic models that estimate the poverty reduction benefits of farm yield growth, either due to lack of data or perhaps because it is considered unimportant due to the “small farm efficiency” argument. This raises the question as to how small a small farm has to get before the agriculture

² LADDER was a research program funded from 2000 to 2004 by the then Policy Research Program of the U.K. Department for International Development (DFID), with a contribution to work in Kenya made by the United Nations Development Program.

³ The cobweb theorem can be checked out in almost any intermediate microeconomics textbook. See, for example, Gravelle and Rees (2004).

⁴ High-value agricultural ventures, such as flower-growing for the European market, can, of course, become a significant source of foreign exchange and are, therefore, worthwhile pursuing, but they are not going to change the livelihood status of the millions of maize farmers in southern Malawi or the teff and barley growers in the Ethiopian highlands.

optimist begins to perceive that this may actually constitute part of the problem of rural poverty rather than part of its solution.

It is unfortunate that very little reliable data exist on farm size trends in Sub-Saharan Africa. For various methodological reasons, agricultural censuses that are conducted from time to time in individual countries are of little help. Yet qualitative research in rural communities invariably reveals that this is the factor that most preoccupies rural families when they look to the future. Even if they have just about enough land now, they can see that the next generation will not be so lucky, and intergenerational tensions about the future disposition of land rights are prevalent everywhere. Meanwhile, a sizeable and growing proportion of the rural poor already do not have sufficient land to produce enough food for the calendar year, and these are swelling the ranks across the continent of those who may require emergency food security at any time or, indeed, are already on more-or-less permanent social security measures.

The average farm size across 1,345 households in four countries in the LADDER project was near 1.5 hectares. Table 2 shows the distribution of farm sizes across sample households by country. Between 40 and 50 percent of households by country sample had farm sizes under 1 hectare in 2001. In one case study location, Suba district on Lake Victoria in Kenya, the average farm size had declined from 20 hectares per household in the mid-1960s to just over 1 hectare per household in 2001. In this instance, verification was possible because the area chosen for research had been newly settled on the basis of 20-hectare farm sizes shortly after the country's independence in 1963 (Cross 2005). In Ethiopia, a country currently following an agriculture-led growth strategy, evidence suggests that the average farm size is now about 0.75 hectare and has been declining steadily for decades. Even if farms are not physically subdivided, intergenerational land-sharing reduces the effective land area for individual households in the extended family or clan.

Declining farm size reflects inheritance norms under customary and state land tenure in a great number of SSA countries. It also, of course, reflects the eventual exhaustion of the land frontier in most countries and the failure of rising populations to urbanize fast enough to stabilize available farmland per rural household. In the context of unreliable growth and urban policy failures, it further reflects the understandable unwillingness of SSA citizens to cede their access rights to land altogether, since land has hitherto provided the final safety net should nonfarm occupations fail. However, the scope for land to continue to play this role is nearly exhausted in many places.

Table 2. Distribution of Farm Sizes between Sample Households (LADDER Project)

Farm Size (hectares)	Uganda n=315 (%)	Tanzania n=350 (%)	Malawi n=280 (%)	Kenya n=175 (%)
None	7.7	4.6	0.4	2.9
Fewer than 0.5	25.9	11.7	10.7	16.0
0.5–1	23.3	29.7	31.1	24.6
1–2	22.7	29.4	39.3	30.3
2–3	10.5	13.7	12.9	14.3
3–5	6.1	7.1	5.0	7.4
More than 5	3.8	3.7	0.7	4.6
Total	100.0	100.0	100.0	100.0

Source: LADDER Project sample surveys conducted in 37 villages, 2001–2002 (Ellis and Freeman 2004).

In summary of these arguments, liberalization did not provide a panacea for the disappointing agricultural performance in Sub-Saharan Africa in the 1970s, and a number of reasons are advanced as to why this was the case. Postliberalization enthusiasm for utilizing agriculture as the main vehicle for poverty reduction needs a reality check by reference to several facets of farm-based livelihoods in Sub-Saharan Africa that counteract the potentially beneficial effects of rising yields, if such can be secured. These facets include limited domestic markets, unstable prices in free markets, and declining farm sizes, not to mention a host of subsidiary factors that are implicit or explicit in the

discussion of this paper so far. It is perhaps not surprising, then, that small farm households in Sub-Saharan Africa have sought, over many years, to secure part of their livelihood, and preferably as large a part as possible, from nonfarm income sources. People, as they say, vote with their feet.

4. Rural Livelihood Diversification and Its Paradoxes

For the purposes of this discussion, rural livelihood diversification simply describes the phenomenon by which small farm households take up nonfarm activities or rely on nonfarm income transfers for the overall standard of living that they are able to achieve. The extent of such diversification away from agriculture may be an indicator of the degree to which farming operations, on their own, can provide a secure and improving livelihood. Thus, where diversification is widespread and the share of livelihood portfolios to which it corresponds is considerable, it may be supposed that farming is for one reason or another unable to satisfy those basic requirements.

There is no doubt that diversification in association with small farming has been around a long time. The two classic reasons for diversifying—risk and seasonality—have always been pertinent.⁵ Nonfarm occupations reduce risk by combining activities that have different risk profiles; they can also ameliorate the labor and consumption smoothing problems associated with seasonality. These reasons are likely to have relevance even in the presence of relatively favorable agricultural conditions and the production of a surplus for the market in normal years. In the latter circumstances, however, the expectation would be for agriculture to constitute the fundamental platform of the household livelihood, with other activities merely helping to achieve increased security and stability of outcomes across the calendar year.

In Sub-Saharan Africa, livelihood diversification has come to symbolize a state of affairs that is quite distinct from the minor adjustments at the margin implied by the classic reasons for doing so. The various difficulties confronting small farm agriculture in liberalized markets discussed in the preceding section are heavily implicated. The overall flavor of evolving rural circumstances in the 1990s was captured in rather eclectic fashion by the Deagrarianization and Rural Employment project, conducted by the African Studies Center at Leiden University (Bryceson 1996, 1999, 2002; Bryceson and Jamal 1997). This multicountry project utilized a mixture of qualitative and quantitative methods to derive a composite picture of the relative collapse of agriculture as the primary source of rural livelihoods in Sub-Saharan Africa, as well as the associated broadening pursuit of nonfarm options across the continent.

Key components of this picture are supported by a considerable amount of less diffuse evidence. Studies of rural income portfolios derived from both large-scale, nationally representative sample surveys and purposive household studies converge on the once startling figure that, on average, roughly 50 percent of rural household incomes in Sub-Saharan Africa are generated from engagement in nonfarm activities and transfers from urban areas or abroad, with remittances and pension payments being the chief categories of such transfers (Ellis 2000; Ellis and Freeman 2004; Reardon 1997).

There is a great deal of variation around this mean figure at the household level, but less variation than might be supposed when comparing sample evidence across different countries in a particular region. A strong positive correlation between the proportion of rural household income obtained from nonfarm sources and overall household income per capita has been observed in numerous studies. It is also widely found that while diversity of income sources is prevalent across different income classes, the nature of this diversification differs between better-off and poorer households. The better-off tend to diversify in the form of nonfarm business activities (trade, transport, shop keeping, brick making, etc.) or salaried employment, while the poor tend to diversify in the form of casual wage work, especially on other farms, while remaining heavily reliant on subsistence crop production.

Rural livelihood diversification in Sub-Saharan Africa contains several paradoxes that are worth exploring for the light they shed on the actual and potential role of agriculture in poverty

⁵ See, for example, Netting (1993) for discussion of these reasons in peasant farming societies in the north as well as the south.

reduction. It might be thought that diversification would be the last resort of those unable to gain a sufficient livelihood from their depleted farms, and there is some truth in this, but it is not the whole story. In the LADDER project, the positive correlation between per capita household incomes and share of income obtained from nonfarm sources was strongly affirmed.

A case study from Tanzania provided in Table 3 typifies this finding. It is observed that the average farm-nonfarm split for the sample of 344 households is almost spot on the 50-50 division referred to above as a widespread finding in Sub-Saharan Africa. The relative dependence on agriculture declines across the income ranges, from 68 percent for the poorest quartile to 43 percent for the richest. It is notable that the share of livestock in the income portfolio of the top quartile more than doubles compared with the bottom quartile, and the share of nonfarm business income quadruples from 11 to 44 percent of the income portfolio.

Table 3. Income Portfolios by Income Quartile, Tanzania (LADDER Project)

Income Sources	Income Quartile				Total n=344
	I n=87	II n=88	III n=88	IV ^a n=81	
Maize	27.1	21.5	15.1	7.9	12.4
Rice	12.3	14.2	10.3	8.8	10.0
Other crops	23.3	19.9	23.8	11.8	16.3
Livestock	5.0	7.7	6.5	14.1	11.0
<i>Subtotal agriculture</i>	67.7	63.3	55.7	42.6	49.7
Wages	14.6	8.9	9.3	11.0	10.5
Nonfarm business	11.5	23.7	29.3	44.0	36.1
Transfers	6.3	4.2	5.7	2.5	3.7
Total	100.0	100.0	100.0	100.0	100.0

Source: LADDER Project sample of 344 rural households in 2001 (Ellis and Mdoe 2003).

^a Seven specialized pastoral households were removed from the top quartile.

It might be thought that the attention paid by better-off households to nonfarm activities would result in the neglect and poor performance of their farming activities. Not so at all. Table 4 shows for all four LADDER project countries how agricultural productivity per hectare rises steeply across the income ranges. Net farm output per hectare in a series of country samples was between three and six times higher for the top income quartile of households compared with the lowest income quartile.

Table 4. Net Farm Output per Hectare, by Income Quartile, for Four Countries (LADDER Project)

Country	Income Quartile (US\$/ha)				Ratio IV:I
	I	II	III	IV	
Uganda	131	215	295	487	3.7
Kenya	135	266	358	430	3.2
Tanzania	81	108	156	381	4.7
Malawi	18	44	84	109	6.0

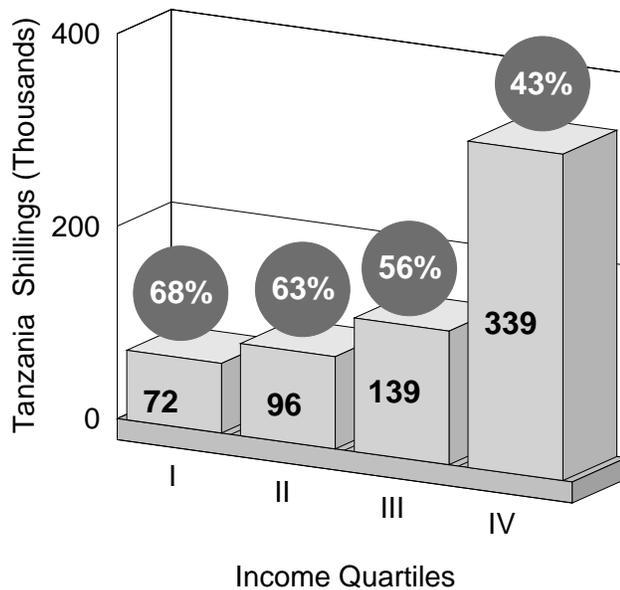
Source: LADDER Project (Ellis and Freeman 2004).

Taking the Tanzania case as an example, Figure 1 compares the rising net farm income per hectare across the income quartiles against the figures for the share of agriculture in total per capita income derived from Table 3. The picture is an interesting one: The lower the importance of agriculture in the total income portfolio of the household, the higher the farm productivity realized. This emphasizes the interdependence between farm and nonfarm livelihood components that describes doing well in rural Tanzania. However, it also points in a broader direction that is compatible with the agriculture skeptic position. It is possible that farm productivity in Sub-Saharan Africa rises as a function of household members taking up nonfarm opportunities, rather than being the driver of such opportunities, as is proposed in much of the agriculture-led growth literature.

The widely observed rural livelihood patterns illustrated by the LADDER project data help shed light on the dynamics of rural vulnerability in Sub-Saharan Africa. The poorest and most vulnerable are those most heavily reliant on agriculture and most strongly locked into subsistence within agriculture. This is a growing proportion of rural households in food-insecure and poorly performing SSA countries. The same category of the rural poor also tends to be dependent on work on other farms in order to cover the deficit in their household food balance. This exacerbates rather than diminishes their vulnerability for two reasons: First, labor on other farms can mean neglect of good cultivation practices on their own farms (Alwang 1999); and, second, work on other farms proves an unreliable buffer when adverse natural events occur that affect all farms in a geographical zone.

It is clear that livelihood diversification, whether by the better-off, middle, or poor, possesses positive attributes for reduction of poverty and vulnerability in Sub-Saharan Africa. It is partly predicated on, and itself increases, human capital in terms of experience, skills, and willingness to innovate. It generates earnings and remittances that alter the options open to the household by providing it with cash resources that can be flexibly deployed. It contributes to lessening vulnerability by ameliorating risk and reducing the adverse consumption effects of seasonality. In general, livelihood diversification improves livelihoods, and to the extent that it fails to do so, this can often be traced to adverse public sector contexts that penalize people in the market and on the move. This conveniently brings us to the next step in the argument of this paper, which is the necessity for an accelerated rural-urban transition in Sub-Saharan Africa.

Figure 1. Tanzania’s Rising Yields and Declining Dependence on Farming



5. Rural-Urban Transitions and Poverty Reduction

Previous sections of this paper have proposed that the potential benefits of yield growth in small farm agriculture in Sub-Saharan Africa are offset by a number of adverse trends and circumstances, so that, in practice, little net gain occurs in farm incomes. Indeed, in the worst cases, the adverse factors outweigh efforts to raise yields so that livelihood circumstances continue to deteriorate despite the best efforts of all concerned to move forward. Undoubtedly, the most lethal combination is failed growth at the macro level (static or declining per capita gross domestic product) combined with these adverse rural trends. This combination severely curtails the nonfarm options available, throwing rural

households even deeper into excessive reliance on semisubsistence food crop production. A considerable number of SSA countries persistently or intermittently fall into this category.

Table 5 provides rural and urban headcount poverty data for a selection of southern and east African countries in the late 1990s or early 2000s. Are these data trying to tell us something? Yes, they are: With rare exceptions, urban poverty levels are very considerably below rural ones. Some of the rural poverty levels are so high in southern African countries that they are scarcely possible to grasp, yet we know from what happens when there is a slight disturbance in rainfall patterns that southern African rural dwellers are indeed among the most vulnerable populations to food crisis in the world. The agriculture optimist is essentially arguing that these impoverished populations should be kept in agriculture because yield growth on their farms is an essential precursor to their ability to move out, and this argument has been dominant for the past 30 years.

Table 5. Rural and Urban Poverty Data for Selected Sub-Saharan African Countries

Country	Year	Rural (%)	Urban (%)	National (%)
Kenya	1997	52.9	49.2	52.3
Uganda	1999–2000	39.1	10.3	35.2
Tanzania	2000–2001 ^a	38.7	17.6	35.7
Malawi	1997–1998	66.5	54.9	65.3
Zambia	1998	84.0	56.0	72.9
Zimbabwe	1995–1996	76.2	41.1	63.3
Mozambique	1996–1997	71.2	62.0	69.4
Lesotho	1993	53.9	27.8	49.2

Sources: Compiled from original sources in Ellis (2003) and Ellis and Freeman (2004).

^a The urban headcount figure for Tanzania refers to Dar es Salaam only; the figure for other urban areas in Tanzania was 25.8 percent.

Strangely, economists who in all other respects are great believers in the capabilities represented by individual human initiative have a curious myopia when it comes to what people do for a living in cities. When challenged with the notion of accelerated rural-urban transition in Sub-Saharan Africa, they will say “But what will they do there?” or “But there are no visible sources of growth there.” This is, of course, nonsense. People have agency, and people’s agency when freed from the shackles of unremitting toil on the land is to find niches in the urban economy where they can get by. Towns and cities become teeming hives of small-scale activity in which people begin to specialize in providing services for others and to purchase services in return. In this process, they develop new outlooks and skills, and down the line, they become much more interesting for larger scale investments by emerging urban entrepreneurs and eventually industrialists.

In a recent paper, Tiffen (2003) explored a model of rural-urban transitions that ends by cautiously suggesting that urbanization has been hindered by policy in Sub-Saharan Africa and that urban growth is required to stimulate agriculture and to provide jobs for those who are leaving farming (Tiffen 2003, 1343). The interdependency of rural and urban poverty reduction emphasized by Tiffen is central to obtaining a better grasp of the strategic balance between sectors required for accelerated growth and poverty reduction in Sub-Saharan Africa. And caution should be thrown to the wind. For small farm agriculture to grow and prosper in Sub-Saharan Africa, rapid rural-urban transitions will have to take place in order to reverse declining farm size, provide a robust domestic market for farm output, increase cash in circulation in rural areas, and take the pressure off overexploited natural resources.

The link between rural-urban transitions and rural poverty reduction is provided by the diversification evidence. Many observers and politicians have a far too deterministic view of rural-urban migration as being a simple, linear, one-way ticket from one state of being to another. Yet fast-

growing economies, wherever they are encountered, are nothing like this. They exhibit mobility, but this mobility is not a single movement from one occupation to another, as in most of the traditional migration literature; it is a mobility of many different distances and durations and purposes that broadens and deepens trade and exchange between rural and urban areas to the benefit of growth in both sectors.

It is the failure to grasp the nettle of accelerated rural-urban transition that has mired Sub-Saharan Africa in its spreading rural poverty and intensifying vulnerability of the past several decades. Ethiopia is a country that exhibits this failure to an extreme.⁶ Ethiopia has 70 million people, only 17 percent of whom in 2005 live in urban areas. It has suited successive Ethiopian governments going back decades, if not centuries, to keep peasants toiling on the land. Ethiopia has an agriculture optimistic growth strategy called Agricultural Development Led Industrialization, which is built into its Sustainable Development and Poverty Reduction Program (SDPRP) (Ministry of Finance and Economic Development 2002). Urban development is regarded as a minor crosscutting issue that receives two-and-a-half pages of attention in the 200-page SDPRP. In Ethiopia, the state owns the land, and farm families have rent-free access to it and can pass it on to their progeny. Several past land redistributions mean that in the densely settled areas, farm sizes are in the narrow range of 0.5 to 2 hectares. Farm sizes are shrinking because the rural population is growing at 3 percent per annum.

Ethiopia follows policies that trap people in agriculture. The capital or rental value of land cannot be realized (say, as a precursor to moving to town), because the land belongs to the state and cash renting is prohibited. There are widespread perceptions in rural Ethiopia that if land is left for more than three or four months, it will be reallocated by the local administration; the same would also occur if individuals were thought to have moved unduly into nonfarm activities. The current rate of urbanization in the country at 6 percent is considered to be an unwelcome trend, to be contained if at all possible. However, the shocking implication of this is that in 10 years—in 2015—77 percent of Ethiopians will still live on the land, and 15 million more people will have had to be absorbed into an already exhausted agriculture.

6. Conclusions and Implications for Poverty Reduction Policies

A great deal more work needs to be done to get the speculative ideas put forward in this paper into a shape that would stand up to close scrutiny. Nevertheless, the outline of a model of poverty reduction failures in Sub-Saharan Africa begins to emerge. In this model, rural poverty reduction and urban growth are interdependent, and rural poverty reduction requires a much more rapid rural-urban transition than has been occurring in most SSA countries over the past three decades. This also means investing in urban infrastructures and anticipating the arrival of populations in towns in order to avoid the worst horrors of urban squalor. However, there cannot be much worse circumstances than the rural squalor to which very substantial proportions of SSA populations have been consigned for the past several decades.

Various implications for future poverty reduction policies may be deduced from the threads of the argument put forward here. These are briefly identified and discussed as follows.

Facilitating, Not Directing

In general, decisions about what and where to produce are best left to private actors exercising their own agency; what governments, donors, and NGOs can do is contribute to the overall climate of facilitation that surrounds individual decisions. This means supporting and encouraging domestic policies that improve exchange, mobility, communication, information, and infrastructure and discouraging domestic policies that have the reverse of these effects. Clearly, development agencies already contribute in some of these areas. Budget support to education and healthcare provides valuable momentum to increasing human capital, knowledge, and the capability of individuals to

⁶ It is not considered necessary to rehearse Ethiopia's chronic food insecurity situation here, which is known well enough by the likely readers of this paper. Some considerations closely related to those raised here can be found in Devereux, Teshome, and Sabates-Wheeler (2005).

make decisions from a broader set of alternatives. In other areas, however, contributions are weaker, especially when it comes to human mobility and the adverse circumstances under which it typically occurs.

Supporting Urban Growth

Growth processes can be stifled or slowed down just at the point that they might seriously take off due to wrong strategic thinking by donors and governments about the undesirable side effects of growth. Thus, the rapid growth recently observed in capital cities like Kampala or Dar es Salaam, which perhaps offers the only prospects of serious poverty reduction in the countries where they are located, is prematurely curtailed by a failure to support the urban infrastructure necessary to fuel the growth process. Instead, with heads full of populist visions of prosperous peasants, donors neglect urban growth constraints and encourage money to be poured into the impoverished countryside.

The Decentralized Public Sector Institutional Context

An enabling district-level environment for private wealth creation would comprise neutral or progressive local taxation designed to exclude those living at or below the poverty line from the tax net; business registration designed to provide support services to start-up enterprises rather than to penalize them with taxes and other costs; encouragement of mobility in order to broaden spatial options and encourage growth processes wherever these occur; and the generalized removal of spurious obstacles put in the way of people going about the business of making a living by those who derive power from local public sector office. These are aspects of making a living in low-income countries, where a great deal of what occurs in practice operates in opposition to facilitating rapid poverty reduction. While the issues that arise are complex and difficult to tackle, at the very least the gulf between the rhetoric of decentralized local government and its reality needs to be recognized and debated at the policy table.

Agricultural and Rural Policies

A first priority is to support policy levers that have generally beneficial effects upon all types of economic activity in rural areas and on rural-urban mobility, rather than focusing narrowly on agricultural yield growth alone. Thus, infrastructure (roads, communications, power), services (education and health), information (knowledge, ideas, radio, television, newspapers), enabling local public sector contexts for private initiative, exchange, and mobility all have their roles to play.

Many current policy directions in agriculture remain valid and should be supported: improving public-private (including public-NGO) partnerships in service and input delivery, strengthening demand for advisory services, using modern communication technologies (radio, television, mobile phones) to disseminate advice and create discussion in farming communities, continuing to support the development of new technology, and seeking innovative solutions to gaps and failures in private marketing systems.

Land Tenure Reform

A major barrier to beneficial economic change in agriculture is often the historical and prevailing land tenure system. In particular, land tenure systems that fail to allow for the development of a purchase or rental market in land have the effect of reducing mobility, slowing down rural-urban transitions, and rigidifying uneconomic farm size structures. While it is understood that equity considerations often underpin traditional and state-owned tenure systems, in densely settled zones exhibiting extremes of farm subdivision, it is doubtful that anyone gains much from the absence of a land market and from the lack of security of ownership or tenure. Moreover, many existing tenure systems are deeply gender-biased against women both in custom and law, causing serious dysfunctions among control, decision making, and use of land as a productive resource.

Second-Generation Poverty Reduction Strategy Papers (PRSPs)

These should be encouraged to contain wide-ranging recognition of the importance of occupational diversification, mobility, and cross-sectoral interdependencies:

- The current heavily sector and production-oriented bias of PRSPs requires substantive overhaul.
- Aside from their justifiable emphasis on improving access to education and primary healthcare, PRSPs should be primarily about enabling environments that apply across all sectors.
- Artificial and unnecessary blockages to peoples' exercise of their own agency in making a living should be removed wherever they occur, either in central or local government, or for that matter when caused by the concentrated economic power of particular private organizations.
- The antagonistic view of migration expressed in many PRSPs needs removing, to be replaced by a facilitating approach that recognizes what governments must do to support personal economic mobility.
- The resistance to urbanization prevalent in PRSPs also needs to be reversed. Rapid urbanization creates dynamic growth processes that are then often stifled by inept urban planning and a failure to provide the infrastructure necessary for growth to be maintained.

Returning finally to the overall theme of this conference, the future of small farms, there can be no doubt at all that small farms have a future in development and poverty reduction in Sub-Saharan Africa. However, that future must consciously and progressively involve a smaller proportion of national populations over time than is occurring under current trends. Specifically, the trend toward uneconomic micro holdings must at some stage be halted and reversed if there is to be any possibility of sustained increases in output per hectare and if those remaining in agriculture are to enjoy livelihoods sufficiently above the poverty line to avoid the periodic vulnerability crises that currently hit rural areas of SSA countries with undue regularity. It follows that future poverty reduction strategies need to be oriented more to increasing people's mobility out of agriculture than to relying on unwarranted optimism about the beneficial outcomes of agricultural yield growth.

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The Rural Nonfarm Economy: Pathway Out of Poverty or Pathway In?*

Steven Haggblade, Professor of International Development, Michigan State University, USA
Peter Hazell, Senior Institute Fellow, International Food Policy Research Institute (IFPRI), USA
Thomas Reardon, Professor of Agricultural Economics, Michigan State University, USA

1. Characteristics of the Rural Nonfarm Economy

Size

Nonfarm earnings account for 30 to 45 percent of rural household income across the developing world (Table 1). And where available, evidence suggests that the nonfarm share in rural income is increasing over time (Table 2). Thus, although agriculture remains the backbone of most rural economies, the simplistic notion of rural economies as purely agricultural is clearly obsolete.

Table 1. Nonfarm Share of Rural Income

Region	Nonfarm Income Share
Africa	42%
Asia	32%
Latin America	40%

Source: Averages of 101 rural household income surveys reported in Reardon, Stamolous et al. (1998), Table 11.

Landless households depend on nonfarm income to supplement their agricultural wage earnings. Even primarily agricultural households deploy capital and labor between farm and nonfarm activities, enabling them to diversify incomes across the calendar year and reduce seasonal and interannual consumption risks. In many locations, specialized nonfarm households have emerged to exploit full-time business opportunities in the nonfarm economy.

Given low capital requirements and the small scale of many rural nonfarm enterprises, poor households dominate many of the largest rural nonfarm employers. For this reason, policymakers view the rural nonfarm economy (RNFE) as a potentially important contributor to poverty reduction.

The RNFE likewise plays a pivotal role in the process of structural transformation, during which the share of agriculture in total national output declines and transfers of capital and labor drive a corresponding rise in manufacturing and services. Since many of the resource flows from agriculture to the secondary and tertiary sectors of the economy transit functionally and spatially via the RNFE, an understanding of the forces that drive change in the RNFE becomes central to understanding the processes that drive overall economic growth.

Composition

The RNFE houses a highly heterogeneous collection of trading, agroprocessing, manufacturing, commercial, and service activities. The scale of activity varies enormously, from part-time self-employment in household-based cottage industries to large-scale agroprocessing and warehousing facilities operated by large multinational firms. Often highly seasonal, rural nonfarm activity fluctuates with the availability of agricultural raw materials and in rhythm with household labor and financial flows between farm and nonfarm activities (Figure 1). Across settings, the composition of nonfarm

* In preparing this paper, the authors have drawn heavily from their draft book manuscript, *Transforming the Rural Nonfarm Economy*.

activity differs considerably as a result of wide variations in natural resource endowments, labor supply, location, history, and institutional environments (Table 3).

Table 2. Growing Nonfarm Income Shares

	Rural Nonfarm Income Share Of		
	Farm Household Income	Rural Income	National Income
China			
1978-80	17%	-	4%
1985	25%	-	7%
1990	26%	-	10%
1995	37%	-	26%
1997	39%	-	28%
India			
1968	-	26%	-
1980	-	36%	-
2000	-	46%	-
Japan			
1950	22%	-	-
1960	42%	-	-
1970	63%	-	-
1981	80%	-	-
1987	84%	-	-
South Korea			
1971	18%	-	-
1981	33%	-	-
1991	46%	-	-
Taiwan			
1970	45%	-	-
1975	47%	-	-
1980	65%	-	-
1987	78%	-	-
Thailand			
1976	35%	-	-
1986	46%	-	-

Sources: Oshima (1984), Hazell and Haggblade (1991), Poapongsakorn (1994), Hayami (1998), Fan, Hazell and Thorat (1999), Huang (1999), Chadha (2003).

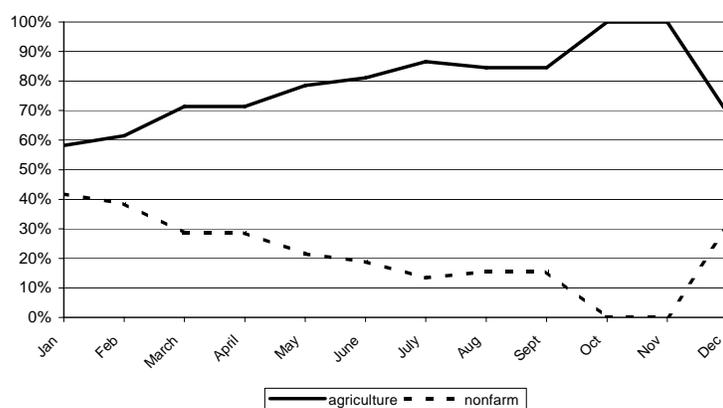
Table 3. Heterogeneity of Rural Nonfarm Activity (Percentage of Total Rural Employment)

Primary employment*	Rural Brazil, 1996		Rural El Salvador, 1994			Rural Uganda, 1992	
	Northeast	Southeast	West	Central	East	Hoima	Mukono
Mining and natl resources	5.5	1.1	0	0.9	0.3		
Manufacturing	3.5	5.6	10.6	13.4	5.6	15.9	13.6
beverages	0.1	0.2				11.2	3.3
food processing	1.1	1.3					
textiles	0.6	0.5	2	3.8	1.5	1.2	0
straw	0.6	0.7	2.3	3.1	0.6	2.3	8.6
wood	0.6	0.5				1.2	0.7
shoes and leatherware	0.1	0.1				0	1
other manufacturing	0.4	2.3	6.3	6.5	3.5		
Construction	2.6	4	4.1	6.5	2.8	5.1	5.3
Utilities	0.2	0.5	0.4	0.4	0		
Commerce	4.4	4.6	9.3	12.7	9	32.1	25.3
retailing and wholesaling	3.7	3.2	7.1	9.9	7.1	32.1	25.3
transport	0.7	1.4	2.2	2.8	1.9		
Services	10.8	16.5	9.2	14.6	5.5	7.1	16.8
restaurant/hotel	0.8	1.3	0.1	1.3	0	2	8.8
finance	0.1	0.2	0.2	0.2	0.2		
teaching	2.9	2.2	0.8	0.4	0.9		
health			0.5	0.5	0.2	2.3	1
domestic service			3	5.8	2		
personal services	1	0.9					
government	1.4	1.3	0.5	0.1	0.1		
other services	4.6	10.6	4.1	6.3	2.1	2.8	7
Total nonfarm	27	32.3	33.6	48.5	23.2	60.2	61
Total agriculture	73	67.7	66.4	51.5	76.8	-	-
Total employment*	100	100	100	100	100	-	-

*Uganda data list percent of households involved. All others are percent of primary employment.

Source: Ferreira and Lanjouw (2001), Lanjouw (2001), Livingstone (1997).

Figure 1. Seasonality of Rural Nonfarm Employment*, Ethiopia, 1993



* Distribution of employment among landless laborers.

Source: Habtu (1997).

Sectorally, despite a common policy emphasis on rural industries, manufacturing typically accounts for only 20 to 25 percent of rural nonfarm employment, while trade, transport, construction, and other services account for 70 to 80 percent (Table 4). Spatially, the composition of nonfarm activity varies as well. While home-based cottage industries predominate in rural areas, towns and urban centers support an increasing concentration of factory manufacturing, services, and trade (Table 5). The composition of services differs as well. Whereas rural areas house small retailers, basic farm equipment repair services, and input supply firms, other services, such as primary schooling, health clinics, barber shops, milling, and transport facilities, tend to locate in small towns. Larger settlements attract cinemas, restaurants, and wholesale distributors, as well as higher-level school, health, and communication facilities (Wanmali 1983). Remittances account for a large share of nonfarm income in some locations, particularly in the mining economies of southern Africa. In most other locations, however, local rural nonfarm businesses account for a majority of nonfarm income, usually in excess of 80 percent (Table 6).

Table 4. Composition of Rural Nonfarm Employment by Region (Percent)

	Nonfarm Share of Rural Workforce	Women's Share of Rural Nonfarm Employment	Rural Nonfarm Employment Shares				Total Rural Nonfarm
			Manufacturing	Trade & Transport (1)	Financial and Personal Services(2)	Construction, Utilities, Mining and Other(3)	
Africa	10.9	25.3	23.1	21.9	24.5	30.4	100
Asia	24.8	20.1	27.7	26.3	31.5	14.4	100
Latin America	35.9	27.5	19.5	19.6	27.3	33.5	100
West Asia and North Africa	22.4	11.3	22.9	21.7	32	23.2	100

Notes:

1. Trade and transport includes wholesale and retail trade, transport and storage.
2. Other services includes finance, insurance and community and social services
3. Other includes mining and quarrying, utilities, construction and other non-classified activity.
4. Country data weighted by size of total primary work force.

Source: 31 population censuses as summarized by Hazell, Haggblade and Reardon (forthcoming). Regional aggregates weight country data by size of total primary workforce.

Table 5. Employment Shares by Activity and Size of Locality, India, 1971

Locality	Population	Total Employment		Nonfarm Employment Shares (percent)						
		Agriculture	Nonfarm	Manufacturing		Transport	Trade	Services	Construction	Other
	Size			Household	Factory					
Rural	< 5,000	84.9	15.1	21.6	15.7	5.9	15.7	35.3	3.9	2
Rural towns	5,000 – 100,000	23.6	76.4	8.6	19.5	10.5	25.4	25.4	4.5	1.8
Urban	> 100,000	4.7	95.3	3.9	30.3	12	21.5	27.8	3.5	0.7

Source: Hazell and Haggblade (1991).

Table 6. Location of Rural Nonfarm Earnings

Country	Year	Nonfarm Share of Total Income	Composition of Nonfarm Earnings (% of Total Income)		Ratio of Local Nonfarm to Migratory	Source
			Local	migration		
		a	b	c	b/c	
Africa						
Botswana	1974/5	54%	14%	40%	0.4	Valentine (1993)
Botswana	1985/6	77%	26%	51%	0.5	Valentine (1993)
Burkina Faso, unfavorable zones	1981-84	37%	34%	3%	11.0	Reardon et al (1992)
Burkina Faso, favorable zones	1981-84	40%	39%	1%	39.0	Reardon et al (1992)
Kenya, central	1974/5	42%	30%	12%	2.5	Collier and Lal (1986)
Kenya	1984	52%	38%	14%	2.7	Livingstone (1991)
Kenya, western	1993	80%	53%	27%	2.0	Francis and Hoddinott (1993)
Malawi	1990/1	34%	26%	9%	3.0	Peters (1992)
Mali, southern	1994-6	6%	5%	1%	5.0	Sundbert (1989)
Mozambique	1991	15%	14%	1%	25.0	Tschirley and Weber (1994)
Namibia, unfavorable zones	1992/3	93%	16%	78%	0.2	Keyler (1996)
Namibia, favorable zones	1992/3	56%	37%	19%	2.0	Keyler (1996)
Niger, unfavorable zones	1989/90	52%	33%	19%	1.7	Hopkins and Reardon (1993)
Niger, favorable zones	1989/90	43%	38%	5%	7.8	Hopkins and Reardon (1993)
Senegal, northern unfavorable	1988/9	60%	54%	6%	9.0	Kelly et al. (1993)
Senegal, central	1988/9	24%	20%	4%	5.0	Kelly et al. (1993)
Senegal, southern	1988/9	41%	39%	2%	19.0	Kelly et al. (1993)
South Africa, former homelands	1982-6	75%	25%	50%	0.5	Nattrass and Nattrass (1990)
Sudan	1988	38%	30%	8%	3.5	Teklu et al. (1991)
Tanzania	1969	32%	30%	2%	12.0	Ellis (1999)
Tanzania	1976/77	32%	30%	2%	14.0	Ellis (1999)
Tanzania	1980	24%	20%	4%	5.0	Ellis (1999)
Tanzania	1980	25%	21%	4%	5.0	Collier et al. (1990)
Tanzania	1983	38%	33%	5%	6.0	Ellis (1999)
Tanzania	1991	11%	10%	1%	10.0	Ellis (1999)
Zimbabwe, overall	1990/1	38%	26%	12%	2.2	World Bank (1996)
Zimbabwe, poor	1990/1	31%	17%	14%	1.3	World Bank (1996)
<i>Africa average</i>		43%	28%	15%	1.9	
<i>average excluding Botswana, Namibia and South Africa</i>		36%	29%	7%	4.1	
Latin America						
Brazil	1997	39%	37%	2%	20.0	Da Silva and Del Grossi (2001)
Colombia	1997	50%	48%	2%	20.0	Echeverri (1999)
Ecuador	1995	41%	39%	2%	20.0	Elbers and Lanjouw (2001)
Mexico	1997	43%	36%	7%	5.5	De Janvry and Sadoulet (2001)
Nicaragua	1998	42%	37%	5%	7.0	Corral and Reardon (2001)
<i>Latin America average</i>		43%	40%	3%	14.5	

Source: Compiled by Reardon (1997) and Reardon, Berdegúe and Escobar (2001).

The extreme heterogeneity of the rural nonfarm activity results in widely varying productivity and profitability (Table 7). Women dominate many of the low-return cottage industries, which typically require minimal capital investment and yield correspondingly low returns (Table 8). For this reason, in situations where a stagnant rural base offers few productive alternatives, many observers fear that widespread distress diversification into low-return rural nonfarm activities may signal a pathway into poverty (Islam 1987; Shand 1986).

Table 7. Returns to Labor in Rural Nonfarm Activities, Darfur, Sudan, 1993

Nonfarm Activity	Income Per Day (Sudanese Pounds)	Sector
Tabag making	10	manufacturing
Carpet making	21	manufacturing
Pot making	23	manufacturing
Tea selling	60	commerce
Water peddling	75	commerce
Food selling	80	commerce
Shoe making	150	manufacturing
Blacksmithing	150	services
Construction	180	services

Source: Ibrahim (1997).

Table 8. Capital Intensity and Returns to Labor in Rural Nonfarm Activities, Bangladesh, 1980

Industry	Capital Per Worker (tk)	Value Added Per Worker (tk/day)	Share Of Female Workers
Tailoring	4,982	27.5	20%
Dairy products	3,076	23.4	10%
Gur (sugar) making	711	20.0	0%
Carpentry	3,009	19.9	4%
Jewelry	1,283	18.7	2%
Blacksmithy	760	15.8	2%
Handloom weaving	1,594	15.1	38%
Oil pressing	1,006	12.6	43%
Pottery	799	11.8	47%
Paddy husking	303	7.4	56%
Bamboo products	313	5.2	49%
Mat Making	465	5.2	63%
Fishing nets	265	4.8	63%
Coir rope	145	4.1	64%

Source: Hossain (1984) cited in Lanjouw and Lanjouw (2001).

Equity Impact

The poor face great pressure to explore opportunities in the RNFE. Rural landless and near-landless households depend heavily on nonfarm income sources. Those with less than 0.5 hectare earn between 50 and 90 percent of their income from nonfarm activities.¹ Yet the paucity of their human,

¹ See, for example, Meagher and Mustapha (1997), Rosegrant and Hazell (2000), Corral and Reardon (2001), and Ferreira and Lanjouw (2001).

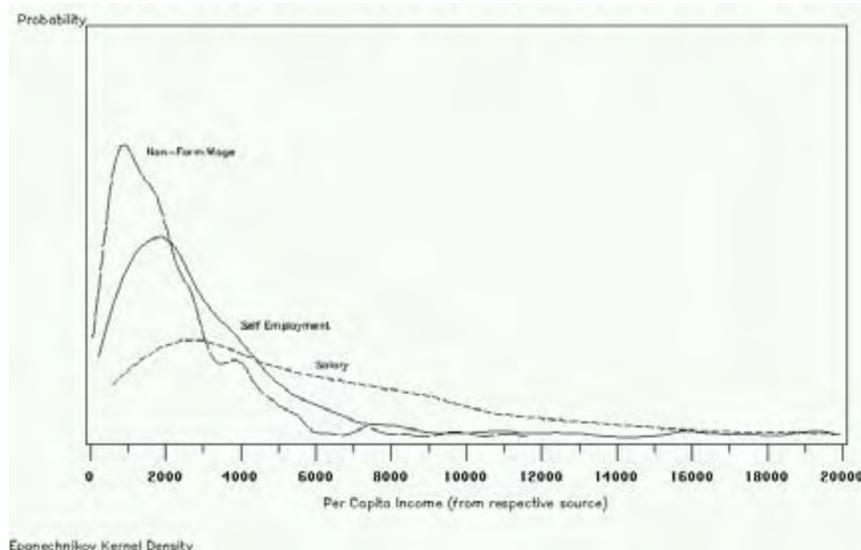
financial, and physical capital often confines them to low-productivity, low-growth market segments, which offer few pathways out of poverty, simply a means of bare survival. As a result, the RNFE often becomes bifurcated, with sharply unequal distribution of income and with richer and more educated households dominating white-collar employment and the most lucrative business niches, while poor households remain relegated to labor-intensive, low-return activities (Table 9, Figure 2).

Table 9. Income Sources by Quintile in Rural India, 1999

Quintile	Agriculture			Nonfarm Income		Total nonfarm	Other income	Total income (percent)	Real Per Capita Income (rupees)
	Cultivation	Agriculture wage Labor	Wage labor	Self employment	Regular Employment				
Lowest	38.2	28.2	15.8	11.4	4.4	31.6	2	100	1,146
Q2	38	21.3	14.7	16.8	7	38.5	2.3	100	2,113
Q3	45.2	13.4	10.1	16.3	11.7	38.1	3.2	100	3,141
Q4	50.1	7.5	6.1	14.6	18.6	39.3	3.2	100	4,712
Highest	64.5	2.1	2	7.9	21.1	30.9	2.5	100	11,226
Total	54.9	8	5.9	11.5	17.1	34.4	2.7	100	4,468

Source: Lanjouw and Shariff (2004).

Figure 2. Probability Density Function of Nonfarm Incomes, Tamil Nadu



Source: Jayaraman, Kijima, and Lanjouw (2003).

Because of the differing equity impact of various segments of the RNFE, its overall impact on income distribution remains mixed (Table 10). In some instances, aggregate nonfarm earnings improve equity across household groups. In other cases, they exacerbate inequality. And in some settings, the relationship between household welfare and nonfarm income shares proves U-shaped. Empirically, no consistent pattern emerges.²

² For an overview of the equity question, see reviews by Chuta and Liedholm (1979); Haggblade, Hazell, and Brown (1987) Bagachwa and Stewart (1992); Reardon (1997); Reardon, Stamolous et al. (1998); Reardon, Taylor, et al. (2000); Barrett, Reardon, and Webb (2001); Lanjouw and Lanjouw (2001); and Lanjouw (forthcoming).

Table 10. Mixed Equity Impact of Rural Nonfarm Income

Quintile*	Rural Nonfarm Income as Share of Total Income					
	Equity Enhancing		Neutral		Inequitable	
	Kenya 1975	Pakistan 1989	India 1999	Ethiopia 1990	Ecuador 1995	Viet Nam 1997
Poorest	82%	75%	32%	32%	22%	40%
2nd	80%	63%	39%		37%	42%
3rd	45%	36%	38%	30%	37%	50%
4th	40%	33%	39%		46%	60%
Highest	-	21%	31%	31%	64%	82%

* Kenya data are provided by quartile.

Sources: Reardon, Stamolous et al. (1998), Lanjouw (1999), Lanjouw and Shariff (2004).

2. Dynamics

Structural Transformation

The present structure of the RNFE in developing countries results from an ongoing economic transformation that has proceeded for many generations at varying speeds in different countries. At an aggregate level, structural transformation is a widely observed process by which productivity growth accompanies a shifting sectoral composition of economic activity. Widespread agreement exists that the share of agriculture will fall during this transformation and that transfers of capital and labor from agriculture will facilitate growth in the expanding industrial and service sectors of developing economies (Chenery and Syrquin 1975). Disagreements and doubts, however, emerge about whether policymakers can siphon resources from agriculture with impunity or whether prior investments in agricultural productivity are necessary to enable resource transfers to take place without raising food prices and choking off industrial development. During the 1950s and 1960s, most policymakers believed that structural transformation and rapid economic growth would emerge most quickly through a focus on urban-based manufacturing. They anticipated that surplus labor in agriculture would allow them to drain resources from agriculture without depressing farm output (Enke 1962; Jorgenson 1961; Lewis 1954). Subsequent empirical evidence, however, revealed a generally positive marginal product of labor in agriculture, suggesting that premature labor force reductions in agriculture would risk choking off industrial growth via rising food prices and urban wage rates (Johnston and Mellor 1961; Kao, Ansel, and Eicher 1964). As a result, early investments in agricultural productivity appear necessary both for raising per capita incomes and for permitting the release of resources (labor, capital) from agriculture to make them available for investment in manufacturing and service activity (Lipton 2005; Tomich, Kilby and Johnston 1995).

Initial settlement of rural areas almost always depends on agriculture because, unique among economic pursuits, agriculture requires physically dispersed production. In some instances, however, other basic economic activities, such as tourism, mining, entrepôt trade or administrative centers, may also motivate initial human settlement in rural areas. Without these intrinsically rurally based economic activities, human settlement does not normally occur in rural areas. In most developing country settings, agriculture forms the backbone of the rural economic base.. As the largest employer in rural areas, the largest income generator, and the largest purveyor of raw materials, agriculture clearly plays a predominant early role, influencing the size and structure of the RNFE.

The “Pull” Scenario in Dynamic Agricultural Regions

Where new agricultural technologies and modern farm inputs become available, they lead to agricultural surpluses in some commodities and increased opportunities for trade. In these settings, a growing agriculture stimulates growth of the RNFE through a number of key linkages. Rising labor

productivity on the farm increases per capita food supplies and releases farm family workers to undertake nonfarm activities. For this reason, Green Revolution India saw agricultural labor fall from 75 to 65 percent of rural labor force in the first 25 years following the release of Green Revolution rice and wheat varieties (Hazell and Haggblade 1991). Equally important, increases in farm incomes, together with high rural savings rates, make capital available for investment in nonfarm activities. These savings rates have reached up to 25 to 35 percent in many areas of Green Revolution Asia (Bell, Hazell, and Slade 1982; Hazell and Ramasamy 1991).

Increasingly productive modern agriculture requires inputs and services, such as seeds, fertilizer, credit, pumps, farm machinery, marketing, and processing facilities, which, in turn, create a growing demand for nonfarm firms that can provide these services. Farm households, as their incomes grow, increase their expenditure share on nonfood items, thereby accelerating demand for nonfarm goods and services, such as housing, clothing, schooling, health, prepared foods, visits to town, and trips to the cinema and tea shops, which collectively increase the demand for rural transport services (Hazell and Roell 1983). To meet this growing demand, rural households increasingly diversify into production of rural nonfarm goods and services (refer to Table 2).

Some nonfarm activities, initially undertaken by farm households for self-consumption, spin off as separate full-time commercial enterprises. Others, particularly labor-intensive household manufacturing of baskets, pottery, and roof thatching, die out, displaced by the import of cheap plastic pails, iron vessels, and corrugated roofing from urban factories.³ For this reason, household manufacturing typically dies out in rural towns and urban areas (refer to Table 5). The demise of low-productivity household manufacturing explains, in part, why employment in services and commerce frequently grows faster than in manufacturing (Table 11). Changes in consumer spending likewise contribute to faster growth in services and commerce. Consumption data indicate that as incomes rise, rural households increase spending on such services as education, health, transport, cinemas, prepared foods, and transport faster than they do on local manufactured goods.⁴

As towns grow, they attract more workers from the rural hinterland. The share of agriculture in the total workforce begins to decline, even though absolute levels of agricultural output and employment may continue to grow for some time. Over time, agriculture becomes progressively less important as the economic motor for the regional economy. Thus, after several decades of agriculture-led growth, India's urban economic growth has stimulated corridors of rural nonfarm development along major highways and transport routes (Bhalla 1981). Eventually, agriculture becomes a relatively minor economic activity in some rural regions as well as in many national economies.

The composition of rural nonfarm activity changes perceptibly over time in these buoyant agricultural settings. Increases in real wages raise the opportunity cost of labor, thereby making low-return nonfarm activities uneconomic. This leads to the demise of many low-productivity craft and household manufacturing activities and to the growth of higher-return nonfarm activities, such as mechanical milling, transport, commerce, and personal, health, and educational services (Table 12).

³ Hymer and Resnick (1969) have dubbed these declining rural manufactures "Z-goods." See Anderson (1982) for empirical evidence of this bifurcated transition.

⁴ See King and Byerlee (1978), Hazell and Roell (1983), and Hazell and Ramasamy (1986).

Table 11. Annual Growth in Rural Nonfarm Employment by Sector

		Agriculture	Total Nonfarm	Mining & Quarrying	Mfr.	Utilities	Construc.	Trade	Transport & Storage	Financial Services	Social Services
Bangladesh (1974-1991)											
	<i>Rural</i>	-0.1	6.8	-	-1.1	12.9	17.4	-	4.1	33.2	-7.5
Cameroon (1976-1987)											
	<i>Rural</i>	1.1	-2.3	4.0	-3.5	14.1	5.1	5.6	6.8	4.6	1.1
Dominican Republic (1970-1981)											
	<i>Rural</i>	-3.2	5.7	13.1	2.5	20.4	13.0	5.5	-4.2	-7.9	9.1
Ecuador (1974-1990)											
	<i>Rural</i>	0.5	3.8	8.0	1.3	0.2	5.0	4.4	5.0	11.8	7.1
Egypt (1960-1986)											
	<i>Rural</i>	0.0	3.5	4.3	3.2	5.7	7.0	-0.1	4.9	-	3.3
Honduras (1974-1988)											
	<i>Rural</i>	1.9	7.7	4.5	2.2	31.6	-10.2	4.7	2.3	15.3	7.6
India (1971-1991)											
	<i>Rural</i>	1.9	2.9	2.8	2.1	-	3.8	3.9	4.2	3.1	-
Indonesia (1971-1995)											
	<i>Rural</i>	1.0	2.6	8.3	2.7	7.1	5.6	3.2	5.5	9.7	3.1
Korea, Republic of (1970-1980)											
	<i>Rural</i>	-0.8	1.4	-0.8	2.6	5.0	0.3	2.1	2.5	9.1	-0.5
Morocco (1971-1994)											
	<i>Rural</i>	1.2	1.4	-2.2	1.4	2.0	3.9	3.3	3.7	22.6	-0.9
Philippines (1970-1980)											
	<i>Rural</i>	0.8	-1.8	4.6	-4.6	6.8	1.0	-1.2	2.4	-	1.9
Turkey (1970-1990)											
	<i>Rural</i>	0.9	1.7	1.3	1.6	7.0	3.4	2.3	2.2	4.0	1.6
Venezuela (1981-1990)											
	<i>Rural</i>	3.4	2.5	8.1	2.9	0.6	0.2	3.3	4.2	8.6	5.9
Average (unweighted)		0.7	2.7	4.7	1.0	9.4	4.3	3.1	3.3	10.4	2.6

Sources: Country censuses. See Hazell, Haggblade and Reardon (forthcoming) for details.

Table 12. Labor Market Influences on Size and Composition of Rural Nonfarm Activity, Bangladesh, 1982

	Income Per Hour in Agriculturally Underdeveloped Regions (taka/hour)	Percent By Which Agriculturally Developed Regions Exceed Underdeveloped Areas*		
		Income Per Hour**	Employment (hours/week)	Income Per Household
Agriculture	5.1	29%	8%	40%
Nonagriculture				
Services	11.4	4%	30%	35%
Cottage industry	4.4	90%	-81%	-63%
Wage labor***	2.8	6%	-41%	-38%
Trade	2.3	195%	-28%	113%
Total nonagriculture	4.4	59%	-29%	12%

* Hossain distinguishes agriculturally "developed" and "underdeveloped" regions by a number of criteria: access to irrigation, use of moder rice varieties, and fertilizer consumption, among others. In the agriculturally developed regions, modern varieties cover 60% of cropped area compared with only 5% in the underdeveloped areas.

** Calculated from Hossain (1988), Tables 48 and 64.

*** Nonfarm wage labor includes earth hauling, construction, transport, and "other" employment.

Source: Hossain (1988), 95,120.

The "Push" Scenario in Stagnant Agricultural Zones

In regions without a dynamic economic base, patterns of growth in the RNFE unfold very differently. Where population growth continues unabated for many generations, land availability diminishes and ultimately, in the absence of careful land management, so does soil fertility. Without technological advance in agriculture, labor productivity and per capita farm production fall.

In such settings, growing landlessness pushes labor force increments into nonfarm activity by default (Table 13). Falling agricultural labor productivity, low opportunity cost of labor, and declining household purchasing power induce diversification into low-return, labor-intensive nonfarm activities, such as basket making, gathering, pottery, weaving, embroidery, and mat making. Specialized nonfarm enterprises and households emerge, not to exploit potential productivity gains, but because of an absence of opportunities in agriculture and a shortage of investible capital. Declining economic conditions likewise motivate labor migration in search of more favorable opportunities elsewhere. Thus, migration serves as a regional safety valve as households seek farm and nonfarm employment opportunities in more distant regions.

Rural residents seek out exchange opportunities in these settings, too, but mainly as they try to identify market outlets for their labor-intensive cottage industry goods. Rural towns, rather than accelerating agricultural advance, become evacuation points for rural labor and for labor-intensive rural nonfarm exports. A stagnant, low-input agriculture generates little demand for inputs or high-value repair, processing, and personal services.

Many describe this bleak downward spiral as a process of agricultural involution. As one review comparing stagnant and rapidly growing agricultural regions in India concluded: "The difference between the faster growing agricultural areas and others is primarily in terms of the productivity and income levels in rural industries. ... Slowly growing agriculture not only fails to introduce any structural changes in rural industries ... but also tends to keep those engaged in rural industries at a subsistence level of productivity and income" (Papola 1987, 104).

Table 13. Distinguishing Good News from Bad: Contrasting Sources of Rural Nonfarm Employment Growth in a Stylized Asian Rice-Growing Economy

Initial Shock	The Green Revolution (Pull) Improved Agricultural Technology,* Labor Using	The Sponge (Push) Population Growth**
Resulting changes		
Rural nonfarm employment	1.9%	1.9%
Total rural employment	6.6%	2.1%
Rural wage rate	6.6%	-3.9%
Nonfarm income	1.1%	-4.7%
Total real per capita income	7.4%	-4.4%

Using a semi-input-output model, with stylized data drawn from the Muda River region of Malaysia, these results simulate the following impact:

* labor-using technical change in agriculture that increases foodgrain output by 80% and is adopted by 50% of farmers.

** population growth rate of 6% over 3 years, just sufficient to generate an equivalent increase in rural nonfarm employment.

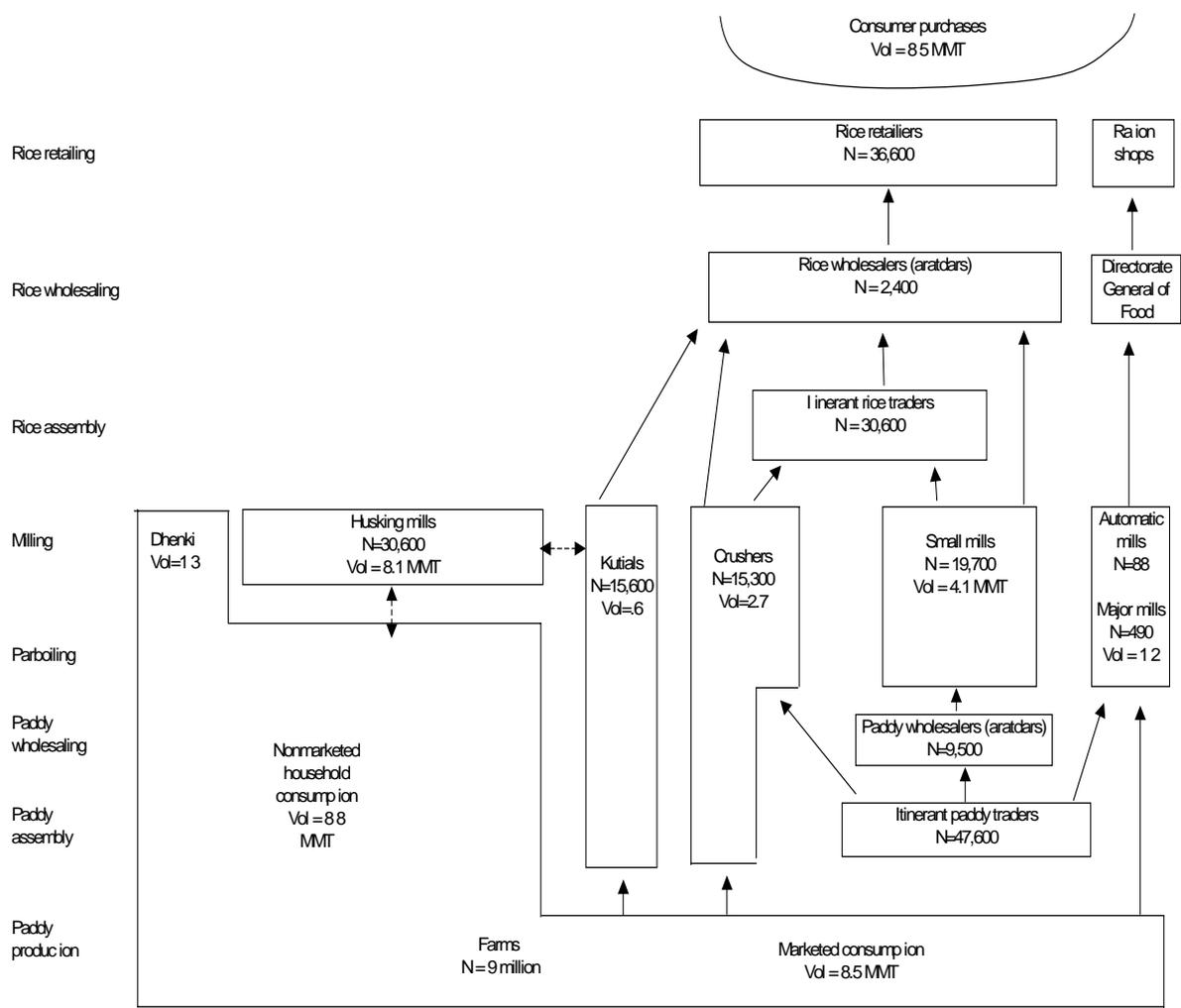
Source: Haggblade and Liedholm (1991).

Liberalization and Globalization

Beginning in the 1990s, widespread economic liberalization opened up the RNFE as never before—to new opportunities and to new threats. Liberalization, by reducing direct government involvement in production and marketing, has opened up new market opportunities for the private sector, particularly in agricultural processing, input supply, and trade. Relaxed controls on foreign exchange and foreign investment have unleashed a flood of foreign direct investment into Latin America, Asia, and Africa. As a result, large exporters, agribusiness firms, and supermarket chains increasingly penetrate rural economies of the developing world, altering the scale and structure of rural supply chains as they do (Reardon and Timmer 2005; Reardon, Timmer, et al. 2003).

This rapidly changing environment opens up opportunities for some rural suppliers to access new markets. In Bangladesh during the second half of the 1980s, liberalization of the import of small diesel engines, as part of agricultural policy reforms intended to boost irrigated rice production, simultaneously but quite unexpectedly launched a veritable revolution in two major rural nonfarm activities. After the cropping season, millers harnessed the new diesel engines to power 30,000 seasonal hammer mills, transforming the structure of rice milling and dramatically increasing competition in rice markets (Figure 3). Later, during the rainy season, metal smiths and boat makers adapted the engines to power thousands of river boats, converting these classic dhows from cheap-but-slow to cheap-but-rapid inland water transport (Jansen et al. 1989). Similarly, in Thailand following World War II, retired Office of Strategic Services operative Jim Thompson began working with silk weavers in northeast Thailand, improving production technology and quality in rearing, reeling, and weaving. In the process, he helped develop an international reputation for the unique quality and design of Thai silk. The resulting growth in silk exports transformed opportunities for more than 60,000 village women, enabling them to access international markets and, in the process, roughly quadruple returns (Figure 4).

Figure 3. Rice Marketing in Bangladesh, 1990

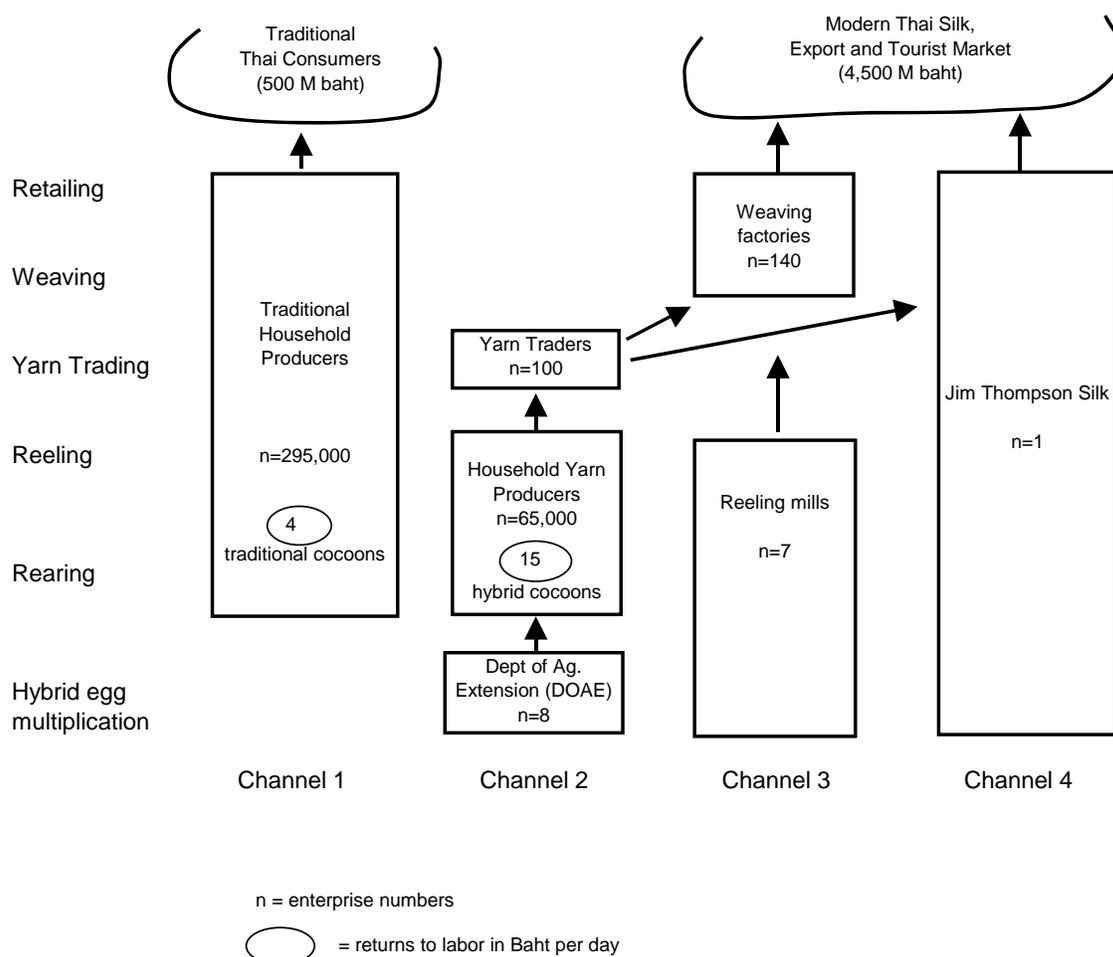


N = numbers of enterprises
 Vol = volume in million metric tons (MMT) of rice equivalents

←-----→ contract milling

Source: Chowdhury and Hagglade (2000).

Figure 4. Thai Silk Subsector, 1991

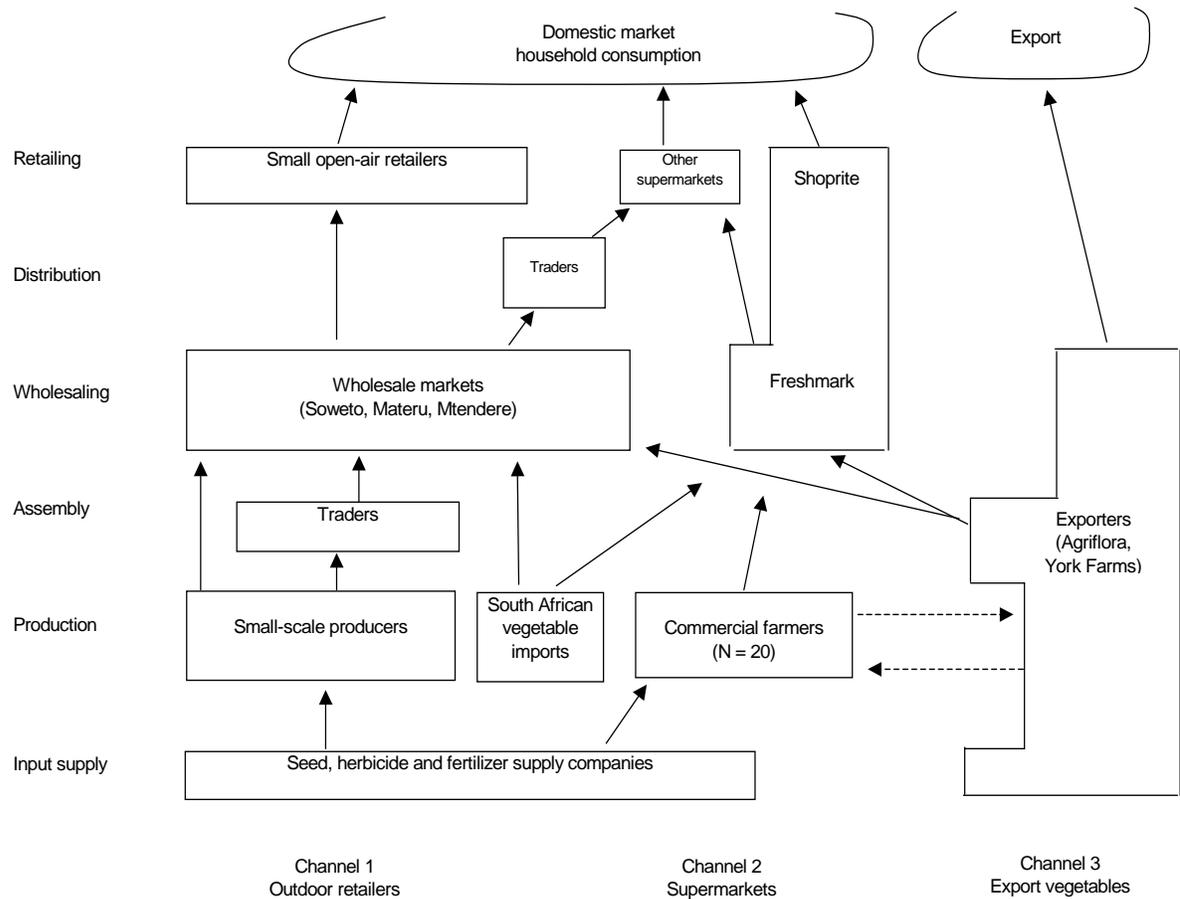


Note: Markets are depicted as topless ovals.

Source: Haggblade and Ritchie (1992).

However, liberalization and globalization expose other rural businesses to new threats, as quantity requirements and quality standards impose new ways of doing business that risk excluding undercapitalized rural enterprises on which the rural poor often depend. In Latin America, where supermarkets now account for more than 60 percent of food retailing, the risks of this increasing market concentration have been most pronounced (Reardon, Timmer, et al. 2003). Available evidence suggests that rapid concentration has triggered the bankruptcy of thousands of small firms in recent decades. In Argentina, from 1984 to 1993, more than 60,000 small food retailers closed their doors (Gutman 1999), while in Chile, between 1991 and 1995, more than 5,000 small food retailers ceased operations (Faigenbaum, Berdegué, and Reardon 2002). Even in Sub-Saharan Africa, South African supermarket chains have expanded aggressively northward, following the advent of majority rule in 1991 and the demise of economic sanctions that had previously prevented these investments. Two major chains, Shoprite and Pick 'n Pay, have opened outlets in cities and rural towns in Zambia, Malawi, Mozambique, and Uganda and are considering forays into West Africa. In each locality, the supermarkets have significantly altered product selection and market share in favor of imported South African brands at the expense of local farmers, processors, food suppliers, and retailers (see Figure 5; Weatherspoon and Reardon 2003).

Figure 5. Urban Vegetable Marketing in Zambia, 2004



N = number of participants
 Vol = volume of export green beans (total = 19,500 tons)

—————▶ cash sale
 - - - - -▶ contract sale

Source: Manda et al. (2004).

In the past, some categories of rural nonfarm activity thrived because of protection from outside competition by high transport costs, restrictive production policies (such as reserved handicraft industries in India) and trade policies (including barriers to cheap imported consumer goods), subsidized inputs and credit, and preferential access to key markets (as in town and village enterprises in China). Globalization and market liberalization remove many of these barriers, effectively “deprotecting” the RNFE. The transition may prove brutally abrupt for many traditional small-scale manufacturing activities, whose products cannot compete with higher-quality, mass-produced goods. For this reason, the initial stages of deprotection can lead to massive job losses in the RNFE, even though many of these may later be recovered as new types of rural nonfarm activity sprout up, as happened in India during the 1990s (Bhalla 1997). Because poor households and female-dominated activities predominate among the low-investment, low-productivity rural nonfarm pursuits, poor women tend to face the most difficult adjustment during this transition.

3. Measuring Sectoral Growth Linkages

Within the rapidly changing rural economies of the developing world, economic opportunities for poor households emerge sectorally in agriculture and nonfarm activities and locationally in rural areas, rural towns, and urban centers. Given strong sectoral complementarities and interactions, an understanding of these linkages becomes central to identifying effective poverty reduction strategies. While initial public policies and investments will trigger first-round gains in particular economic activities, they likewise initiate second rounds of economic growth through linkages with other sectors. These second-round effects can potentially make substantial contributions to both income gains and poverty reduction.

Types of Linkages

Analytically, economic growth linkages fall into four main categories. *Production linkages* include forward linkages from agriculture to nonfarm processors of agricultural raw materials, as well as backward linkages to input suppliers of farm equipment, pumps, fuel, fertilizer, and repair services. These input-output relationships generate distinctive patterns of rural nonfarm activity across agricultural regions. In western Colombia, the rapid growth of smallholder coffee farming in the early 1900s stimulated a collateral rise in rural transport services, as well as local production of jute bags, pulping machinery, and coffee processing (Berry 1995). In contrast, the spurt in Viet Nam's rice production during the 1990s generated growth in rural nonfarm activity concentrated mainly in favorable agricultural zones and dominated by farm input supply, milling, and commerce (Trung 2000).

Consumption linkages include spending by farm families on locally produced consumer goods and services. One classic study from Green Revolution India determined that higher-income small farmers spent about half of their incremental farm income on nonfarm goods and services, as well as another third on perishable agricultural commodities such as milk, fruit, and vegetables, thus generating strong demand linkages for locally supplied consumer goods and services (Mellor and Lele 1973).

Factor market linkages between agriculture and the RNFE have received growing attention in the linkages literature in recent years. In rural labor markets, the strong seasonality of demand in agriculture generates corresponding surges in rural nonfarm activity typically tied to troughs in agricultural labor demand.⁵ And links between labor demand and rising rural wage rates may offer important connective tissue by which poor households in one sector can benefit from growth in the other (refer to Table 12). Similarly, cash surpluses from agricultural sales frequently finance nonfarm investments, while reciprocal reverse flows from rural nonfarm activities finance the purchase of agricultural inputs.⁶

Productivity linkages between agriculture and the nonfarm economy have emerged most recently in the growth linkage discussions.⁷ More nebulous and difficult to measure, they include an array of beneficial macro linkages transmitted between agriculture and the nonfarm economy. In particular, lower food prices may increase productivity of poor manual laborers, a linkage of considerable potential importance given the growing awareness of the beneficial impact of food prices on nutrition and workforce productivity (Behrman and Deolalikar 1988; Strauss and Thomas 2000). Some studies have suggested that agricultural productivity also improves food security and political stability, leading to higher productivity of capital and learning by doing by both government and firms (Block and Timmer 1994). Others emphasize knowledge flows, which accelerate productivity growth in both agriculture and nonfarm production (Tomich, Kilby and Johnston 1995). These effects

⁵ In addition to Figure 1, see Norman (1973), Romjin (1987), and Itoh and Tanimoto (1998) for evidence from Nigeria, Thailand, and Japan, respectively.

⁶ See Lucas and Stark (1985); Collier and Lal (1986); Evans and Ngau (1991); Reardon, Crawford, and Kelly (1994); Carter (1997); Marennya et al. (2003); and Ellis and Freeman (2004).

⁷ See Block and Timmer (1994) and Tomich, Kilby and Johnston (1995).

correspond analytically to the productivity enhancing technical change induced by international trade (Grossman and Helpman 1992).

Reverse Linkages

Early linkage discussions focused primarily on agriculture as the engine of rural economic growth. More recently, with growing recognition of the surprisingly large scale of rural nonfarm activity in many rural areas, the prospect for a reversal of this causality, from nonfarm to farm, has received growing recognition.⁸ Certainly production linkages run in both directions. The establishment of rural canneries can stimulate on-farm production of tomatoes, fruits, and other perishables (Reardon, Crawford, and Kelly 1994). Likewise in the consumption arena, nonfarm income—perhaps from mining or rural administrative centers—generates demand for local agricultural products. Hence the commonly observed truck farming that grows up around rural and urban towns.

Factor markets, likewise, inherently involve ebbs and flows between agriculture and nonfarm activities. Productivity linkages similarly run in both directions. Nonfarm firms introduce benefits to farmers in the form of timely repair services, improved input supply, output marketing, and enhanced farmer incentives.⁹ In many instances, liquidity provided by nonfarm earnings provides funds for the purchase of modern hybrid seeds and fertilizer necessary for increasing farm productivity.

Agricultural Growth Multipliers

A recent review of 30 empirical growth linkage studies suggests the following general conclusions (see Haggblade, Hazell, and Dorosh, forthcoming).

Generalization 1: Growth Linkages Frequently Prove Substantial

On balance, available evidence suggests strong linkages between agriculture and the RNFE—strongest in Asia, weaker in Africa (though with the potential to increase along with changes in the input structure of agriculture and with rising incomes), and least strong in Latin America for structural reasons. Differences in available estimates of growth linkages emerge because of differing types of agriculture, economic and social settings, units of analysis, and modeling assumptions. In the end, a plausible range for national agricultural growth multipliers lies between 1.6 and 1.8 in Asia and 1.3 to 1.5 in Africa and Latin America (Table 14). Different technologies and different settings generate different outcomes (Tables 15 and 16). Key conditioners affecting the value of second-round linkages include the distribution of the initial income gains, the density of rural infrastructure and population, social and political structure, as well as the physical distribution of urban settlements.

Table 14. Agricultural Growth Linkages By Region

	Initial	Additional Income Growth			Source Of Linkages	
	Agricultural	Other	Rural	Total	Consumption	Production
	Income	Agriculture	Nonfarm			
	Increment					
Asia	1.00	0.06	0.58	0.64	81%	19%
Africa	1.00	0.17	0.30	0.47	87%	13%
Latin America	1.00	0.05	0.21	0.26	42%	58%

Source: Haggblade and Hazell (1989).

⁸ See Ranis, Stewart, and Angeles-Reyes (1990); Reardon, Crawford, and Kelly (1994); Marenya et al. (2003); and Ellis and Freeman (2004).

⁹ See, for example, Ranis, Stewart, and Angela-Reyes (1990); Evans and Ngau (1991); and Tomich, Johnston, and Kilby (1995).

Table 15. Agricultural Growth Linkages from Foodgrains by Technology

	Initial Agricultural	Additional Income Growth		
	Income Increment	Other Agriculture	Rural Nonfarm	Total
Rainfed	1.00	0.10	0.18	0.28
Ox plow	1.00	0.17	0.30	0.47
Irrigated HYV	1.00	0.06	0.58	0.64

Source: Haggblade and Hazell (1989).

Table 16. Locational Distribution of Agriculturally Induced Nonfarm Income Growth

	Change In Agricultural Income	Nonfarm Income Increments Per \$ Of Farm Income Gain		
		Rural	Rural Towns	Total
North Arcott, India (1982)	1.00	0.26	0.51	0.77
Kutus Region, Kenya (1987)	1.00	0.26	0.13	0.39
Michoacan Region, Mexico (1984)	1.00	0.19	0.02	0.21

Source: Computed based on Rosegrant and Hazell (2000), Hazell and Ramasamy (1991), Lewis and Thorbecke (1992), Yunez, Taylor and Dryer (1998).

Generalization 2: Consumption Linkages Dominate

A predominance of empirical studies in the developing world suggests that consumer spending accounts for about 80 percent of agricultural demand linkages, while production linkages account for the remainder (see Table 14).¹⁰ Consumption linkages appear weakest in Latin America and in estate-led agricultural growth in general (de Janvry and Sadoulet 1993; Haggblade and Hazell 1989). Comparisons across a broad group of developed and developing countries indicate that consumption linkages fall from 80 percent of demand linkages in poor countries to about 60 percent in the developed world because of the rising input intensity of agriculture and the growing importance of backward linkages (Vogel 1994). In the developing world, however, particularly in Asia and Africa, consumption linkages from agriculture to the nonfarm economy remain predominant.

Generalization 3: Rural Services and Commerce Account for the Majority of Rural Nonfarm Linkages

Within the RNFE, manufacturing appears most vulnerable to competition from urban goods. Because growing agriculture often brings with it improvements in marketing infrastructure, it facilitates the penetration of urban manufactures in rural areas. So rural manufacturing typically undergoes a substantial transformation in buoyant agricultural regions, as low-quality, low-productivity manufacturing in cottage and home-based industries is displaced by the twin pressures of rising rural wages and growing competition from imports. Meanwhile, rural services, such as housing, education, transport, health, and personal services, grow briskly, largely insulated from outside competition.

¹⁰ See also Ahmed and Herdt (1984); Bagachwa and Stewart (1992); Bell, Hazell, and Slade (1982); Chadha (1986); Delgado, Hopkins, and Kelly (1998); Haggblade and Hazell (1989); and Ranis, Stewart, and Angeles-Reyes (1990).

Generalization 4: Labor Market Linkages Strongly Influence the Growth and Composition of the RNFE

Via labor demand and rural wage rates, agricultural growth influences the composition of rural nonfarm activity (refer to Table 12). Because agricultural productivity growth induces a decline in low-wage nonfarm activities, such as basket weaving and pottery, while at the same time encouraging growth in higher-return services and factory manufacturing, the net impact on total nonfarm *employment* remains ambiguous, even where rural nonfarm *income* is clearly increasing.

Nonfarm Growth Multipliers

In general, demand linkages (production and consumption) from nonfarm to farm are smaller than those from agriculture to rural nonfarm, because of both the smaller nonfarm economic base and the less elastic supply response in much of crop agriculture. Indeed, where computed, these reverse linkages from nonfarm activity to agriculture generally emerge as smaller or statistically insignificant.¹¹

At a national level, the limited available evidence suggests that these results hold as well. Adelman's (1984) classic study of the South Korean economy indicates that initial investments in agriculture may trigger the most rapid and most equitable pattern of national economic growth. On both accounts, her agricultural demand-led industrialization outperformed an export-led industrialization strategy.

On equity grounds, a comparison of eight different African economies finds that agriculture-led growth strategies typically increase incomes of the poor more than manufacturing-led growth (Dorosh and Haggblade 2003).

Conclusions

In many settings, agriculture plays a predominant role governing the scale, structure, and evolution of rural nonfarm activity. As the Green Revolution unfurled across Bangladesh during the 1980s and 1990s, sale of more than a million treadle pumps, 750,000 diesel tubewells, and soaring paddy production launched an explosion in the RNFE—50,000 paddy mills, 80,000 small traders, and 160,000 rural mechanics launched operation, generating a highly visible, agriculturally driven surge in rural nonfarm activity (refer to Figure 3).¹² Yet agriculture does not unilaterally govern the size, composition, and evolution of the RNFE. In the early 1990s, rural manufacturing grew substantially in villages surrounding metropolitan Manila, not because of growth in agriculture, which had peaked in the prior decades, but because urban firms faced increasing incentives to devolve production to suburban locations in search of lower rents and lower wages (Hayami, Kikuchi, and Marciano 1996). The clusters of nonfarm development along transport corridors in India suggest that, over time, external opportunities will increasingly contribute to rural nonfarm opportunities (Bhalla 1981).

In general, as economic development proceeds, agriculture becomes progressively less important as a motor of economic growth. However, given widespread differences in economic conditions and institutional settings, transitions proceed at rates that vary considerably across regions and countries. In the coming decades, agriculture will likely remain a key driver of rural nonfarm activity in south Asia and Sub-Saharan Africa, though less important in other developing regions.

¹¹ Block (1999); Block and Timmer (1994); and Delgado, Hopkins, and Kelly (1998) find smaller reverse linkages, whereas Hazell and Haggblade (1991) find them statistically insignificant.

¹² See Ahmed (2000), Chowdhury and Haggblade (2000), Shah et al. (2000), and Mandal and Asaduzzam (2002).

4. How Can the Poor Participate in Growing Segments of the Nonfarm Economy?

Pro-Poor Engines of Growth

Poverty-reducing economic growth will require several key ingredients: (a) an initial productivity shock in some tradable commodity to serve as an engine of growth; (b) significant first-round income gains; (c) broad and equitable distribution of those income gains via broad, labor-based income growth; and (d) large second-round linkages effects.

As a general rule, engines of growth need to be tradable. A growth strategy that focused instead on nontradable services—for example, training or credit for rural barbers—would stall in the absence of growing market demand. However, a spurt in foodgrain or cash crop production, with ready local or regional export markets, ensures a market outlet for increased production and in turn generates local demand for barbers, transporters, schools, prepared foods, and medical services. Following a tradable engine, a variety of demand-driven rural services may typically follow, resulting in significant second-round income multipliers. In these instances, the RNFE serves as a handmaiden, rather than an engine, of economic growth.

The size of the initial shock also matters. For this reason, as well, agriculture merits priority consideration. Given widespread production of staple foods, gains in maize or rice productivity will normally benefit a large segment of the rural population. In contrast, given the extreme heterogeneity of nonfarm activities, productivity gains in any single nonfarm activity will affect incomes of only a small percentage of the rural workforce. So, at least in the early stages of development, investments in nonfarm business promotion normally generate much smaller initial income increments.

The distribution of an initial income shock is also of critical importance. In general, pro-poor growth will require increasing income from available unskilled labor. In settings where seasonal labor constrains rural household income, such as many parts of rainfed Sub-Saharan Africa, increasing labor productivity (through the use of herbicides, for example, or by seasonal redistribution of key tasks) will prove key to increasing household income from their existing stock of labor. In other locations, such as south Asia, where surplus labor and widespread landlessness exist, the key will be to increase labor demand. In either case, the most effective strategy will be one that improves overall earnings from existing household labor.

As a general rule, pro-poor first-round income increments typically generate the most favorable second-round linkages as well, because consumption linkages dominate as determinants of second-round growth and because the local content of consumer spending typically diminishes as incomes increase. As a result, pro-poor engines of growth often pull in their wake pro-poor passengers.

Clearly, growth opportunities will vary across continents, countries, and regions within them. So, in each specific instance, local assessments will be indispensable in identifying the most promising engines of local economic growth.

Facilitating Participation by the Poor

Following initial income gains, the commercial and service components of the RNFE typically benefit from increased consumer spending, demand for processing services, and input supply linkages. Poor households can potentially participate in this expanding economic growth in one of two ways: as entrepreneurs in growing farm and nonfarm supply chains or as employees in growing segments of the labor market, either in agriculture or in nonfarm businesses.

Poor Households as Entrepreneurs in Growing Supply Chains

Because of rapid changes in many rural supply chains, small farms and firms often need to change how they do business, switch marketing channels, and invest in equipment or organizational arrangements that enable them to access growing market niches. Given disparities in economic power and access to information, these changes frequently require collective action by alliances of small businesses or brokering by pro-poor advocacy groups. Many different models exist for conducting the diagnostic assessments necessary for identifying feasible market niches for small players.¹³ Ideally, coalitions of stakeholders, including trade associations, key private players in the relevant markets, nongovernmental organizations (NGOs) involved in the subsector, and affiliated government agencies, should participate in diagnostic supply chain reviews.

Poor Households as Employees in Growing Segments of the Labor Market

Not every poor person is a natural entrepreneur, however. Many lack the information, mobility, technical skills, financial capital, and personality traits necessary to effectively manage a business. For them, the fastest route to prosperity lies in the rural labor market. In buoyant regional economies, increasing wage rates and labor demand fuel significant opportunities for even unskilled labor (refer to Table 12). The majority of these opportunities emerge in agricultural labor markets and often involve seasonal rural-to-rural farm labor migration. Nonfarm wage employment is also possible in rural processing mills and growing assembly market networks. In other instances, nonfarm employment opportunities require temporary migration to rural towns or urban centers. In exploiting new opportunities in the rural labor market, poor households will benefit from improved information and transport flows, removal of social and economic barriers, and investments in their basic human capital—the key resource poor households possess in abundance—in order to expand labor earnings.

In the end, available evidence suggests that rural nonfarm growth will not automatically lead to improved opportunities for the poor. Wealthy households, well-endowed with financial, human, and political capital, prove better-equipped to take advantage of growth in the high-productivity segments of the RNFE, both as entrepreneurs and as white-collar workers. Meanwhile, poor households, left to their own devices, risk remaining relegated to slow-moving backwaters of the RNFE. Their two major opportunities—as entrepreneurs in growing supply chains or as employees on expanding farms and firms—will sometimes develop naturally. But in many situations, poor households require assistance adapting to and accessing growing niches in increasingly concentrated marketing systems or growing regional labor markets. Policymakers cannot assume that an expanding RNFE will translate automatically into pro-poor growth. For the RNFE to offer a pathway out of poverty, policymakers will need to remove situation-specific economic and social barriers that currently limit entry by the poor into lucrative nonfarm professions.

¹³ See, for example, Boomgard et al. (1992), Montigard (1992), Chen (1996), Dowds and Hinojosa (1999), Bourgeois and Herrera (2000), Lusby and Panliburton (2002), Kaplinsky and Morris (2003), and Meyer-Stamer (2003).

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Discussant Remarks

Anke Niehof, Chair, Sociology of Consumers and Households Group, Mansholt Graduate School of Social Sciences, Wageningen University, Netherlands

It is a pleasure to be given the opportunity to discuss the papers of Frank Ellis and of Steven Haggblade, Peter Hazell, and Thomas Reardon. I would like to begin with a quote from Alberto Valdés from the first day: “We know so little about what drives the rural economy.” I would like to link this statement to another observation that was made yesterday by Glyvyns Chinkhuntha about small farmers having no “voice” and their perspective as agents lacking in the analysis. Of course, small farmers have a voice, but we don’t listen well enough to it. To understand what drives the rural economy, we should listen better to what small farmers, male and female, have to say about their needs and their motivations. We have to take their perspective into account and understand their rationality, which is not the same as indulging in “smallholder romanticism.” I will come back to this issue later.

Ellis and Haggblade, Hazell, and Reardon share their concern for the fate and future of the small farmers, particularly in Sub-Saharan Africa, but their analyses differ in emphasis regarding the role of agriculture. Ellis resolutely presents the agriculture optimist scenario as a dead-end street, pointing to figures about the rural and urban poor that show there are proportionally more rural than urban poor in the countries selected. Haggblade, Hazell, and Reardon, while acknowledging the bleak push scenario, point to the importance of early investments in agriculture and the positive impacts of agricultural productivity. Both papers stress the importance of rural-urban linkages and transitions and off-farm and nonfarm employment. They also have in common their convictions that diversification usually enhances livelihoods, even though it occurs under different circumstances and for different reasons. Regarding the latter, I would like to stipulate that diversification can be done for good and for bad reasons. Good reasons include diversification as a way of strengthening livelihoods and making use of productive opportunities, as in the pull scenario. Diversification for bad reasons occurs when people are up against the wall and have to try any activity to survive.

It is also important to note that Ellis emphatically rejects the notion that the situation in Sub-Saharan Africa now can be compared with or displays similarities to the pre–Green Revolution situation in Asia. I think his arguments are convincing. It seems that in the case of Sub-Saharan Africa, we are dealing with a fundamentally different situation that calls for different solutions. In another respect, however, the situation is different as well. I am talking about the impacts of HIV/AIDS in Sub-Saharan Africa. Both papers have a serious flaw in that they do not account for reverse rural-urban movements and the depletion, or de-diversification, of assets that are brought about by the HIV/AIDS pandemic. This flaw at least partly defeats the feasibility of the track proposed by Ellis. Neither paper applies “an HIV/AIDS lens,” as Loevinsohn and Gillespie (2003) called it. What actually happens is that urban migrants return to their village of origin because they are sick and need the care and support of their family. There they become a double burden. Instead of sending home remittances, they have to be fed and cared for and medical expenses have to be made. This tragedy is happening now in many parts of Africa, especially southern and east Africa, and is adding to the vulnerability of small farmers in large parts of Sub-Saharan Africa.

There is another problematic issue that does not figure in the papers. It is gender. Up to the last session yesterday, we were discussing small farmers in the familiar gender-neutral fashion, as if no feminization of agriculture is taking place and as if women and men generally have the same access to land and other productive resources, which we know is not the case. Haggblade, Hazell, and Reardon mention the demise of home-based cottage industries (because of growing competition of imports) but did not refer to the important role women tend to play in this sector. Women dominate in low-investment, low-productivity rural nonfarm activities because of initial lack of access to productive resources and assets and because of mobility restraints (due to cultural/religious rules or their reproductive duties or both). I think both papers could have been more gender-sensitive in their analyses. I would like to add here that recent research in rural Bangladesh showed that girls from rural families working in garment industries succeeded in creating new leverage vis-à-vis their parents, even to the extent that they could postpone marriage and finance their own dowry (Ali 2005).

There are two more comments I would like to make. First, I think we should pay more heed to demographic parameters. I agree with Ellis that we should use a finer grid to assess mobility patterns in relation to livelihood. I just referred to rural-urban movements as a consequence of HIV/AIDS. Furthermore, variables like population density and distribution (in relation to livelihood options) and population growth (in relation to declining farm size), as well as household size and composition, should be systematically taken into account when addressing the problems and options of small farmers. Here I would like to mention a finding of a research project in rural Ethiopia, in which it was found that small farmers, men and women, in a densely populated and fast-growing area where farm size declined rapidly, acknowledged the connection. In this area, contraceptive prevalence was significantly above average (Ezra 1997).

Finally, I would like to go back to the perspective of male and female farmers and relate this to the issue of food security, an issue that was mentioned a few times but otherwise was not discussed. There is evidence that small farmers sometimes make decisions that favour retaining food supplies, thus enhancing their food security, over selling food crops for an income. The research in Bangladesh referred to above also showed how farmers refrained from engaging in more lucrative vegetable cultivation to stick to rice, not to sell but to feed their own families. Thom Jayne shows in his paper that food crops are not the main source of agricultural income. Small farmers, especially women who are held accountable for feeding the family, are often hesitant to sell food crops and put their family's food security at risk. In a situation of a chronic threat of food insecurity, this is an understandable and rational course of action. We need to know more about rationality from the perspective of the farmers themselves to be able to grasp the meaning behind the figures.

To conclude, because food security motivations occupy an important place in the decision making of small farmers, it is time to look seriously into ways of increasing the productivity of staple crops, particularly staples other than Green Revolution rice or hybrid maize.

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Discussant Remarks

Julio A. Berdegué, President, Latin American Center for Rural Development (RIMISP), Chile

I enjoyed very much reading the excellent paper by Frank Ellis, an incisive critique of four core assumptions of the “agriculture as the engine of growth” argument, as well as the outstanding synthesis by Steven Haggblade, Peter Hazell, and Thomas Reardon of what is known about the rural nonfarm economy. My conclusions, as I finished reading these two papers, are also influenced by our discussions of yesterday.

First, I think most of us would be in total agreement with the idea that different poor rural households engage in different employment and income generation strategies as determined by the following:

1. Their assets, including human capital variables, such as the gender of the head of the household or stage in the life cycle of the household; their access to land; their location; the existence of transnational social networks that span rural-urban boundaries or even national boundaries and that facilitate migration
2. The push-and-pull incentive that Haggblade, Hazell, and Reardon talk about, based on which the household and the individual members of the households make the decisions
3. The institutional, economic, and political contexts, which to a large extent determine these incentives and also the productivity of the access of the households

These strategies include:

1. *Agricultural self-employment*: We have found that a surprisingly low number, typically a minority of poor households, engage in agricultural self-employment as their primary and particularly as their sole strategy of employment. This strategy has high-asset requirements. We’re talking perhaps a fraction of Thom Jayne’s 25 percent upper segment.
2. *Wage employment in agriculture*: Yesterday, we discussed the importance or not of high-value crops. A lot of people overlook these high-value crops saying they are only important for a few hundred households. Yet I would like to argue that perhaps the highest contribution of high-value crops is in providing wage labor and salary labor, not only for on-farm activities, but also, as Alberto Valdés has pointed out, for postharvest activities. Fewer than a thousand table grape farms in Chile are at the base of several tens of thousands of jobs. The same you can see in northwestern Mexico with vegetables, or in Colombia with flowers. Let’s look at high-value crops not only from the perspective of how many farmers can produce them but also in terms of wage employment, direct and indirect.
3. *Non-farm wage and self-employment*: in the industrial sector and, as Haggblade, Hazell, and Reardon correctly point out, particularly in the services sector. At least in Latin America, this is by far the most important avenue for entry of women into the old farm labor market. However, we have also been reminded by Haggblade, Hazell, and Reardon that very often, particularly in depressed rural areas, rural nonfarm employment is what we call in Latin America refuge employment—the rural non-farm equivalent of subsistence farming.
4. *Migration and remittances*: This is very important for many rural households in Latin America, in parts of Asia, and also in parts of Africa. The problem is that just like we have “good” nonfarm and “bad” (or refuge) nonfarm employment, the “good” migration tends to be that which is international. And then we run into different sets of issues. I wonder if the United States or the European Union would like to promote that as an alternative!
5. *Social safety nets*: whether they’re based on traditional institutions and “binding” social capital or are policy-induced.
6. *Diversification or Multi-employment*: This is perhaps the most common of all strategies and is the combination of two or none of the above.

The key conclusion is that rural no longer equals agriculture, by far. The rural economy is much more than agriculture. Let me add that if rural were not more than agriculture, we would be in real trouble! I think the strong point of Ellis's paper is that foreign policy and, in particular, development assistance play a relatively minor role in determining which of these strategies prevails for a given household or for a given region. These are very complex decisions, influenced and made viable by numerous determinants that have to do with institutions, with culture, with assets, with transnational social networks, with the state of the economy, with how good the previous year was, with gender and age, with ratio of active to passive members of the household, and so on—all factors over which we have very little control with our very limited budgets.

Rather than argue the relative merits of farm versus nonfarm, perhaps we should understand that one of the keys to more rapid and sustained rural growth is the link or the synergy between farm and nonfarm, between urban and rural. All agricultural growth today needs and creates nonfarm growth. These are not independent options from each other. I cannot think today of agricultural growth that does not require nonfarm growth and that does not create nonfarm growth. How can we have agricultural growth in today's world that is not immediately essentially linked to nonfarm growth?

We cannot think of these as alternatives. This does not make sense. We can think about the nonfarm growth that has nothing to do with agriculture, but then that takes us into fields such as tourism, which are outside the realm of our discussion today, although they're very important functions for several rural areas.

Given the strong linkages and interdependencies among the strategies, a sectoral discussion in terms of farm versus nonfarm employment and income makes very little sense. If the purpose is to reduce poverty, the aim should be to promote rural growth, farm and nonfarm, urban and in the rural hinterlands. This is what we are calling in Latin America territorial rural development, to which Alberto Valdés and Alejandro Schejtman referred yesterday.

Now, a prerequisite for rural growth is demand. Eleni Gabre-Madhin's example in Ethiopia is very pertinent. In a contemporary world—and I think this includes Africa, although I know much, much less about Africa than I do about Latin America—characterized by more open economies and by processes of urbanization, these dynamic markets, these sources of demand for rural growth, farm and nonfarm, will tend to come from beyond the rural territories, particularly if the rural territories are poor. Urban growth and trade, therefore, are essential for rural growth, including agricultural growth—hence the importance of linking rural territories to these new dynamic markets.

Unfortunately, and perhaps this is the point that Ellis ought to consider, urban growth in many of our developing countries today is a difficult proposition in terms of the creation of formal, good-quality jobs. For example, the recent research by the Economist Intelligence Unit shows that in Mexico, not one net formal job has been created in the past six years. Yet, Mexico has 11 million jobs in the formal sector and 10 million people, many of them rural, in the U.S. economy. Thank you.

Session 4

Summary of the Open Discussion

The discussion session resumed the debate on the appropriateness of comparisons between Africa and pre–Green Revolution Asia. One discussant, who saw stark similarities, noted that farm size, poverty levels, and the share of agriculture in gross domestic product (GDP) all matched between the two regions in respective time periods and accordingly suggested that Africa should draw on Asian experience in advancing its development processes. Another participant, who found the comparison not suitable, stated that Africa has, in fact, experienced its own Green Revolution and saw spectacular maize yield and production surges in the 20th century. The gains from this success have been lost, however, as support systems, characterized by provision of inputs and extension services and improved access to markets, collapsed. To this day, one of the main problems in African agriculture remains the lack of sustained interest and incentives. But all these factors need not be the reason to abandon investment in agriculture altogether and search for solutions in another sector.

Spirited discussion on the ability of agriculture to generate solutions for poverty reduction dominated the session. One participant noted that it is difficult to envision non-agriculture-led growth in Africa, given the limited industry growth in the region. Another stated that shocks to agriculture should not be mistaken for absence of positive growth trends, but that proper stabilization and insurance mechanisms should be put into place to mitigate such shocks. To generate 6 percent of GDP growth per year needed to see substantial reductions in Africa's poverty levels, the focus of policymakers should be on expanding the involvement of the public sector, learning from the mistakes of structural adjustment policies, and exploring innovative solutions, such as private-public partnerships, to allow the agricultural sector to play its proper role. The performance of industry and tradable services sectors in Africa force one to become an agriculture optimist, this participant argued, because agriculture is the only thing one can be optimistic about in this region. His suggestions were echoed by another participant, who added that giving political voice to farmers is a critical component of putting agriculture on the top of the agenda, since disparities in political power lie at the root of systematic neglect of agriculture by the African governments and the international community.

In defending his suggestion to focus on urban growth, Frank Ellis mentioned evidence of recent rapid urbanization in a number of African cities, including Kampala and Dar es Salaam, without marked increases in poverty rates, although other cities, such as Addis Ababa, have explicit policies to deter rural-urban migration. A major argument for abandoning efforts in agriculture was that over the past few decades, a substantial amount of funds have been injected in the sector and a number of reforms undertaken, resulting in only pockets of growth throughout Africa. According to Ellis, more research on nonagricultural engines of growth is clearly needed. In discussing the ways to promote the development of the rural nonfarm economy, the need to invest in roads, communications, and electricity, as well as to scale up nonfarm products when there is sufficient demand and promote their marketability, was emphasized by several participants.

Attempting to reconcile the two viewpoints, one participant noted the artificiality of the farm/nonfarm distinction and proposed that more attention be given to the intersection between the two and ways of maximizing this intersection, rather than playing the two sectors against each other. Another suggested that it is more constructive to look at a farmer not as an independent entity but to place him or her in market context and adopt a supply chain perspective, incorporating the nuances and features of both rural and urban economies. The supply chain emphasis should be the central way of combining agribusiness, industrial organization, and farm economy analytical perspectives to design methods for improving small farmers' situations. In his concluding remarks, the session chair underscored that the dichotomy between farm and nonfarm sectors should not be the driver of the debate and advocated the use of a supply chain lens, which allows for connectivity between consumers through intermediaries back to nonfarm activities, processing, and primary production.

Session 5
Productivity of Small Farms:
Technology and Innovation

From Policy Aims and Small-Farm Characteristics to Farm Science Needs

Michael Lipton, Research Professor of Economics, Poverty Research Unit, School of African and Asian Studies, University of Sussex, UK

1. Introduction

This paper addresses four questions, often treated separately, but necessarily linked. Each question is complex, and space is limited. So please forgive simplifications and telegraphese.

1. Given the high and usually **rising share of farmland in small farms** in most poor countries, and the evidence on how output per hectare varies with farm size, when and where is development based on small farms conducive to mass poverty reduction, and with what implications for the **audience on which farm science should focus**?
2. Given what we know about how farms become and stay efficient, competitive, and poverty-reducing, what **type of technical progress** helps them do so—and is any type harmful?
3. How can **research** lead to more of the “helpful” technical progress and less of the “harmful” sort—or, to disaggregate the question, what kind of research might improve smallholder access, or returns, to key inputs (water, seeds, fertilizer, and pest management)? If policy analysts know that, it helps them to decide what incentives, and to whom, will get appropriate research done.
4. Do the answers to the last two questions depend on changing global **market requirements**? In particular, can technical progress “for small farms”—so far largely about production—respond to, or keep pace with, post-harvest changes (e.g., the rise of supermarkets) that challenge the foundation of small and family farms’ competitiveness: relatively low unit transaction costs of labor?

2. The *Growing* Role of Small Farms in Low-Income Agriculture, the “Inverse Chicago Question,” and the Nexus of Small Farming, Science, and Poverty Reduction

The “conventional wisdom” is that value added per hectare-year has a direct relationship (DR) to farm area in developed countries, but an inverse relationship (IR) in developing countries. This view is, however, mired in confused and confusing controversy. Why?

- Small farms overlap substantially with, but are not the same as, “family farms” (where a substantial majority of labor is from the family, cutting unit labor transaction costs); “part-time farms” (where a farm manager devotes a substantial part of her time to other activity); and “subsistence farms” (deficit farms mostly growing staples). Each of these three is often, with little or no evidence, called ‘non-viable’ (a term that is seldom defined), or otherwise assumed to be a Bad Thing. In particular, deficit staples farms are often absurdly contrasted with “commercial farms,” yet they—although more than usually risk – averse—are under intense survival pressures to behave commercially.
- Farm size is normally measured in hectares per household; for most purposes, efficiency-units of land and/or per-person or per-family-worker holdings are more appropriate (Julka and Sharma 1989).¹
- Much debate about the IR/DR seeks the evidence in larger farms’ (a) higher/lower unit production cost, and (b) as a main cause of this, conventional diseconomies/economies of scale; and/or (c) lower/higher *crop- and season-specific yield*. Yet (a) agriculture shows no systematic variation with scale in unit production cost; (b) economies or

¹ In a village in the Indian Punjab, the per-person Gini of operational land (farm size) was halved when measured per person instead of per household (Julka and Sharma 1989).

diseconomies of scale are rare—and largely irrelevant, since large-area farms are not linear blowups of small-area farms but typically choose higher capital:labor ratios; and (c) the IR in developing countries, where found, is due largely to smaller farms' lower labor-linked transaction costs—and hence incentive to choose more labor intensity and thus a *higher-value product mix and greater land use intensity* (non-fallowing, double-cropping).²

- Farm size, as a determinant of net value added per hectare, interacts with land and water quality. So whether land productivity is affected by farm size—in any sense with policy implications for, say, land redistribution—depends on the extent to which land and water quality depends on farmer action (e.g., land/water improvement or maintenance) that itself depends on farm size. Whether or not it does so is hard to observe.
- There are serious technical problems empirically (a) in separating the effects on net value added per hectare of variability with scale of unit production cost, unit transaction cost (UTC), variable factor proportions, and access to and adoption of new techniques, and (b) with the production-function methodology for assessing any of the above (Mundlak 2001).³

Scholars have repeatedly reviewed the vast mass of micro-evidence, sometimes without romantic or ideological illusions about either clean, modern, large-scale progress or natural, peasant, small-scale tradition. Despite the above difficulties and big variations in research methods, an IR between farmland per household and net value added per hectare in developing countries and a DR in developed countries are among the best confirmed relationships in economics.⁴ There are counter-examples within economics and in anthropological studies showing great variation of output per hectare *given* farm size⁵; both are commonly due to “hidden variables,” for example, input or output subsidies or regulations selectively helpful to big farms, or rapid technical progress with initial adoption on medium-size farms. However, the IR-DR finding remains. Occasional ideological advocacy of small or big farms as such, sometimes based on selective rhetorical onslaughts on the work of others, can be good knockabout fun, but life is too short to refer to or refute such papers. Many reviews of careful micro-research show that:

- a. There is little variation to scale in unit *production* cost in farming, though with a few cases of modest scale-economies in high-income, capital-intensive farming and of modest scale-diseconomies in low-income, labor-intensive farming.
- b. In all countries, it is cheaper for small than for large farms, per unit of output, to seek, screen, and supervise family *and hired* labor; its skills are better known, and there are more supervising workers per laborer and per hectare. But it is cheaper for large than for small farms, per unit of output, to borrow and to supervise physical capital. Hence large and small farms show two differences in UTC: it is higher on small farms for capital, lower for labor.
- c. However, in farming, capital UTC looms much larger than labor UTC in high-income countries. Farm labor is costly relative to farm capital, so farmers go for high capital:labor

² In developed countries a DR predominates, because capital, as a factor of farm production, becomes more important relative to labor; and it is *large* farms that have transaction-cost advantages in borrowing and in supervising physical capital. [For reviews of the literature, see Berry and Cline 1979; Booth and Sundrum 1985; Binswanger, Deininger, and Feder 1996; and Eastwood, Lipton, and Newell 2006 (forthcoming).]

³ “Empirical assessment of scale economies in production is normally approached [by] fitting production functions to farm-level data so as to measure differences in total factor productivity between large and small farms as reviewed in Mundlak 2001. According to Binswanger et al. 1996 proper empirical assessment of efficient scale ideally requires a measure of ‘profits net of the cost of family labour, per unit of capital invested’ [however, if capital-related transaction costs are scale-dependent, perhaps the best measure, assuming a fixed supply of land, is Ricardian surplus per hectare, i.e., surplus calculated after accounting for all inputs except land]. Such a measure not only allows for transaction costs and scale economies, but also for the possibility that optimal factor proportions vary with scale (which would in general imply that narrowly-defined scale economies would vary according to the factor-proportions ‘ray’ along which they were being measured)” [Eastwood et al. 2006].

⁴ If hectares are measured allowing for land quality, and if bigger farms *in the relevant sample* have exogenously better land, the IR weakens but does not vanish (Bhalla and Roy 1988). If we measure farmland per family member or worker instead of per household, the IR should on theoretical grounds strengthen, but there appears to be no research testing that.

⁵ For excellent examples, see Dorward 1999 and Hill 1992.

ratios: crudely, they intensify (raise output per hectare) with capital rather than with labor. In low-income countries, farm capital is ample and inexpensive relative to farm labor—family or hired—so that farmers seek (and intensify via) low capital:labor ratios.

- d. It follows from *b* and *c* that big farms' lower capital-related UTCs outweigh small farms' lower labor-related UTCs in high-income countries, so that total UTCs tend to be lower on larger farms. Conversely, in low-income countries, small farmers' low UTC in searching, screening, and supervising labor outweighs their high UTC in borrowing to obtain capital and in managing it—so that total UTC tends to be less on smaller farms.
- e. It follows from *a* and *d* that we should expect a DR in agriculture in high-income countries and an IR in low-income countries. From *a*, in both cases there is little or no systematic variation of unit *production* cost with farm area. From *d*, unit *transaction* costs tend to be more on smaller farms in high-income countries, but on larger farms in low-income countries. Hence *total* unit cost—of producing and of transacting—tends to be lower on small farms in low-income countries but larger in high-income countries.

Can this go wrong? First, policy distortions may favor large farms over small in low-income countries or small farms over large in high-income countries. This would weaken or reverse the unit-cost incentives creating the IR and the DR respectively. However, except in unusually ruthless and effective dictatorships, farmers, customers, workers, and lenders learn, over time, how to gain (though not costlessly) by bypassing or ignoring such distortive policies. Also, price distortions for farm inputs and outputs *in developing countries* have substantially declined since 1970.

Second, changing markets, or institutions, may expose farms to new production or transaction costs, perhaps not directly linked to management or acquisition of labor or capital. Such new costs might modify or even reverse the DR in rich countries or the IR in poorer ones. However, intermediation—whether in response to market demand for it or by supply-side co-operation or government action—normally tends to cut such costs (see Section 5 on supermarkets).

In view of *e* above, we therefore expect that farm size (1) will be systematically larger in developed countries, and (2) will rise during development. The data strongly confirm the first expectation (especially with some crude allowance for land quality). As for the second, national micro-studies and aggregate censuses of agriculture strongly confirm that farm size has been increasing steadily in most developed countries, though only since about 1930 [Eastwood, Lipton, and Newell 2006]. For a large majority of farmland in Asia and Africa, however, as we shall show, typical farm size has been falling since 1960. We shortly review why and ask whether *falling* farm size in Africa and (fast-developing) Asia forces us to jettison or modify the argument that changing unit transaction costs with “development” raises optimal farm size. But facts first.

The Food and Agriculture Organization's (FAO's) summary of standardized national agricultural censuses in the World Census of Agriculture (WCA) has weaknesses, omissions, and country gaps, including China. However, WCA is the only large, comparable data source for national trends in farm size. Table 1 shows—for all countries with more than 100,000 hectares of farmland and available data from more than one WCA round in the period 1986–2002—proportions of holdings *and* farmland in the smaller farm-size groups. In the period 1986–2002, accelerated globalization and commercialization were allegedly shifting competitive advantage, even capacity to survive, from small to large farms. This added to any UTC-type pressures from rising capital:labor ratios, alongside development, toward larger farms. Indeed, developed countries (Table 1B) show falling, sometimes sharply falling, shares of farmland in the smaller size groups, though in a few cases not in the very smallest. Surprisingly, however, in seven out of 10 developing countries in Table 1A, in the period 1986–2002 farmland shifted *toward* the lowest size category (< 1 hectare), and also the lowest two size categories (< 2 hectares).⁶ These changes seem to refute the view that globalization, rising

⁶ The two least-poor countries in Table 1A, Turkey and Uruguay—which could as well have been included in Table 1B—show modest falls in the proportion of farmland in the smallest farm-size categories in 1990–2001, as do non-WCA data for another upper-middle-income country, Brazil [Alberto Valdés, pers. comm. July 2005]. Among low-income and lower-middle-income countries, only Ethiopia shows a falling proportion of (private) land in holdings below 1 hectare (Table 1A). This reflects not a shift of private land to larger farms, but continuing redistribution of collective and state lands. This, from the 1989–1992 to the

capital:labor ratios, UTCs, or anything else has made small farms in developing countries dramatically less competitive or survivable. Table 1B does not, however, contradict this scenario for developed countries.

Table 2 uses median data (see below) to take a longer view, for more developing countries, over FAO Agricultural Censuses from 1969 to 1993. These data are not yet available for the 2000 round of censuses, so they exclude possible effects on farm size of recently accelerated farm commercialization and globalization; but Table 1A showed that this did not stop farm size falling in all low-income and lower-middle-income countries with available data. Care is needed in interpreting Table 2—wars, revolutions, and definitional noncomparabilities abound—but the message is unmistakable. “Median size for number” is the size of the median holding, with all *farms* ranked in order of area. If instead we rank all farmed *hectares*, starting with each of the hectares in the largest holding and ending with those in the smallest, “median size for area” is the size of the holding containing the “median hectare.” All 11 African and Asian developing countries in Table 2 show falls, usually steep, in the period 1969–1993 in both median farm size and the size of farm in which the “median hectare” is located, with the sole exception of Korea, which (like Latin American countries, where the trends are mixed) was already substantially industrialized by 1980, with capital:labor ratios and agricultural workforce shares since approaching Organisation for Economic Co-operation and Development (OECD) levels.

Tables 1 and 2 show that a large and—in sharp contrast to developed countries—generally growing proportion of cropland in most low-income countries is cultivated in small holdings; and that a large and growing proportion of farm operators is small. Other big low-income countries, without data for the comparisons in tables 1 and 2, also concentrate their cropland heavily in the smallest operated holdings (e.g., Bangladesh 69 percent below 2 hectares in 1996–1997) (FAO 2005; Singh 1990).⁷ China, with already very small and equal farms after the land reforms of 1977–1985, shows falling farm size, now averaging about half a hectare, with few big farms and low per-person land inequality; China in 1997 had 58 percent of its 130 million hectares of cropland in holdings below 2 hectares (FAO 2005).⁸ By contrast (Table 1), India in 1995–1996 had 36 percent of its 163 million hectares of cropland in 93 million such farms.

The trend to smaller farms is reversed in rich countries. It is starting to reverse in middle-income countries and in some advanced areas of India (and probably China), as development reduces rural labor (including family-farmer) supply and increases capital availability, so small farmers’ high capital-linked UTCs become more penalizing, relative to large farmers’ high labor-linked UTCs. Net reverse tenancy has, famously, emerged in India’s Punjab and Haryana. However, less famously, it is rare elsewhere in low-income and lower-middle-income countries. In brief, a large majority of farming communities of low-income and lower-middle-income Asia and Africa, where free to vote with their feet, have for decades, been voting for smaller farm size (Table 2) and continue to do so (Table 1A).

In the 1980s Michael Carter proposed to students of land reform the “Chicago question”: if there is an inverse relationship in developing countries, why is so much land in large farms?

2001–2002 agricultural censuses, raised private farm area 2.3-fold, while holdings rose only 1.8-fold. Thus many holdings in the smallest size group could be enlarged from formerly public lands. Despite this, the proportion of land in holdings below 5 hectares fell between the agricultural censuses; the falling proportion of land in holdings below 1 hectare was outweighed by the rising proportion in 1-to-5-hectare holdings. (In the period 1977–1989/92, median farm size fell by 46 percent, and size of the farm containing the median hectare by 43 percent [Table 2]).

⁷ Singh (1990) documented the tendency to smaller farm size throughout South Asia.

⁸ China’s only Agricultural Census (1997) does not show farm areas by size group. We have assumed that the average farm in each group is halfway between the group bounds (0–0.2 hectare at 0.1 hectare, etc.).

Table 1. Small and medium farms: Agricultural censuses from 1985

(Countries with > 100,000 hectares farmland and censuses in 1990 and 2000 rounds showing shares of area and holdings by size groups on the Food and Agriculture Organization's Web site)

Table 1, Part A: Africa, Asia, and Central and South America

Country	Year	Holdings (million)	Ha (million)	< 1 Ha		1–2 Ha		2–5 Ha		5–10 Ha		10–20 Ha	
				%hdgs	%ha	%hdgs	%ha	%hdgs	%ha	%hdgs	%ha	%hdgs	%ha
Colombia	88	1.45	36.03	14.1	0.3	21.5*	1.4*	13.0*	1.9*	16.0	4.4	12.6	7.0
	01	2.02	50.71	18.1	0.4	23.0*	1.7*	11.7*	1.8*	14.4	4.0	11.1	6.2
Egypt	90	2.91	3.30	60.6'	18.5'	29.3'	30.4'	6.8,	15.9,	2.1,	10.1,	0.9]	9.8]
	99/00	3.72	3.75	81.1'	33.5'	13.9'	24.0'	3.3,	13.2,	1.2,	9.9,	0.5]	8.8]
Ethiopia	89/92	6.09	4.87	72.1	36.9	20.2	25.2	7.4	25.4	0.3	2.2	..	..
	01/02	10.76	11.05	62.8	27.1	24.3	33.3	11.9	32.6	0.9	5.5	..	..
India	86	97.16	164.56	57.8	13.4	18.4	15.6	13.6"	22.3"	8.1"	28.6"	..	..
	91	106.64	165.51	59.4	15.0	18.8	17.4	16.8	30.9	4.4	19.3	..	..
	95/96	115.58	163.36	61.6	17.2	18.7	18.8	14.8	31.5	3.7	17.7	1.0	9.2
Nepal	92	2.74	2.60	69.8	30.5	19.4	27.6	9.4	28.0	1.2	8.1	..	..
	02	3.34	2.65	74.7	38.9	17.6	29.8	6.9	24.0	0.6	5.3	..	..
Pakistan	90	5.07	19.15	27.0	3.7	20.4	7.6	37.5	27.6	12.3	21.6	4.7	15.8
	00	6.62	20.41	36.1	5.8	21.5	9.7	28.1	27.9	8.8	19.1	3.9	16.3
Panama	90	0.21	2.94	46.7	0.5	11.4	0.9	13.5	2.7	7.6	3.5	7.1	6.7
	01	0.24	2.77	52.7	0.6	..	..	..	..	..	..	..	..
Thailand	88	4.88	17.46	14.4	2.5	12.3^	4.2^	59.7^	54.6^	..	..	..	..
	93	5.65	19.00	19.7	3.0	13.2<	4.6<	45.0<	36.1<	17.2<	32.0<	..	..
Turkey	91	3.97	23.45	15.9	1.4	19.0	4.3	32.1	16.5	18.0	19.0	9.7	21.0
	01	3.02	18.43	15.5	1.3	17.9	4.0	31.5	16.0	18.5	20.7	10.8	23.5
Uruguay>	90	0.05	15.80	>	>	8.1	-----	0.1	-----	12.1	0.3	13.2	0.6
	00	0.06	16.42	>	>	10.9	-----	0.1	-----	12.5	0.3	12.5	0.6

Notes: Holdings without farmland (Colombia 1988; Egypt, Nepal 2002; Panama 2001), area in them (Egypt), and government holdings (Pakistan) omitted. "m" = million

*: 1–3 ha and 3–5 ha, not 1–2 ha and 2–5 ha ; <: 0.8 ha and 0.8–2.1 ha ; : 2.1–4.2 ha and 4.2–8.4 ha |: 8.4–21 ha

": 2–4 ha and 4–10 ha ^: 1–1.6 ha and 1.6–6.4 ha <: 1–1.6 ha, 1.6–4.8 ha and 4.8–9.6 ha >: excludes holdings below 1 ha

Table 1, Part B: Europe and North America

Country	Year	Hdgs (m)	Ha (m)	<1 ha		1-2 ha		2-5 ha		5-10 ha		10-20 ha	
				%hdgs	%ha	%hdgs	%ha	%hdgs	%ha	%hdgs	%ha	%hdgs	%ha
Austria	90	0.27	7.22	3.3	0.1	10.9	0.9	21.3	4.0	17.8	6.8	20.0	13.5
	99/00	0.20	6.80	13.5			2.2	22.0	5.3	19.4	9.7	22.7	17.8
Belgium	90	0.85	1.40	12.3	0.6	8.7	0.9	15.9	3.5	15.2	7.0	19.9	18.2
	99/00	0.06	1.43	15.4			0.8	13.9	2.2	13.7	4.4	16.8	10.8
Denmark	89	0.08	2.77	18.1							3.4	24.1	10.3
	02	0.05	2.67	19.2							2.2	19.3	5.3
France	88	1.01	28.60	7.8	0.1	11.1	0.4	11.6	1.3	11.3	2.8	16.6	8.5
	99/00	0.65	29.88	15.5			0.7	12.3	1.3	9.3	1.9	10.9	4.2
Italy	90	3.02	22.70	32.9	2.1	19.6	3.6	23.5	9.7	11.7	10.7	6.7	12.1
	00	2.59	19.61	38.1	2.4	19.2	3.6	20.6	8.5	10.1	9.3	6.1	11.2
Norway	89	0.10	0.99	4.3	0.3	9.4	1.3	23.5	7.8	25.1	17.9	25.5	35.8
	99	0.07	6.36	20.2					10.6	23.8	20.6	31.5	30.0
Portugal	89	0.59	4.01	30.1	2.3	28.2	5.8	23.8	10.9	9.4	9.6	4.6	9.4
	99	0.42	5.19	26.3	2.7	27.9	6.4	24.4	10.5	10.2	8.6	5.6	0.7
UK	93	0.24	17.14	5.6^			0.1^	8.9^	0.4^	12.0	1.3	15.2	3.1
	99-00	0.22	16.30	9.6			0.1	9.7	0.5	11.6	1.3	13.7	2.9
USA	87	2.09	390.31	8.8*					0.1*	19.8*			1.1*
	97	1.91	377.09	8.0*					0.1*	21.5*			1.2*
	02	2.13	379.71	8.4*					0.1*	26.5*			1.6*

Notes: *USA: Holdings below 0.4 hectare excluded. The entries in the columns "< 1 Ha to 5 Ha" are in fact for 0.4 hectares to 4 hectares, and the entries in the columns "5 to 20 Ha" are in fact for 4 to 20.2 hectares.

^UK: The big rise, 1993–1999/2000, in the proportion of holdings below 2 hectares is partly illusory; 1993 data exclude farmers' only holding if below 6 hectares, with no regular full-time farmer or worker, fewer than 100 days of labor per year, and greenhouse area below 100 square meters.

Finland excluded because 1990 and 1999/2000 data appear non-comparable (60 percent fall in holdings, 53 percent in area).

Source: www.fao.org/es/ess/census/wcares/default.asp.

Table 2. Size (Hectares) of (A) Median Farm and (B) Farm with Median Hectare: Developing-Country Trends¹

Country	Date	Med. Farm	Med. Ha	Country	Date	Med. Farm	Med. Ha
Africa				(Dvpg. Asia)			
Congo DR	1970	1.2	1.8	Turkey	1980	3.6	13.0
	1990	0.39	0.76		1991	3.0	13.0
Ethiopia	1977	1.0	2.3				
	1989/92	0.54	1.3	S/Cent. America			
Lesotho	1970	1.5	2.6	Brazil ³	1970	0.4	520
	1990	1.1	2.4		1980	9.8	730
Malawi	1969	1.2	2.1		1985	8.6	670
	1993	0.52	1.8	Panama	1971	3.6	86
					1981	1.7	95
Dvpg. Asia					1991	1.2	110
India	1971	0.98	5.5	Paraguay	1981	8.2	---
	1977	0.85	4.8		1991	6.9	---
	1991	0.74	3.4	Peru	1972	1.8	---
Indonesia	1973	0.56	1.8		1994	2.5	---
	1993	0.54	1.8				
Korea, Rep.	1970	0.71	1.2				
	1980	0.75	.81				
	1990	0.81	1.4				
Nepal	1972	---	2.4				
	1982	0.49	2.8				
	1992	--	1.6				
Pakistan ²	1980	2.9	7.8				
	1989	2.1	7.2				
Thailand	1978	2.7	5.8				
	1993	2.4	5.5				

Source: FAO agricultural censuses, rounds for the 1970s, 1980s, and 1990s, at www.fao.org/es/ess/census/gini/table2.asp.

Notes: Countries with less than 25,000 hectares of farmland are omitted. The column headed "Med. Farm" shows the "median size for number," that is, hectare size of the median farm ranked by size. "Med. Ha" shows the "median size for area," that is, hectare size of the farm containing the "median hectare" of farmland, with hectares ranked in order of the size of the farm where they are found.

Notes (from original FAO source):

¹ Includes holdings without land [usually zero or very few]. Includes only countries with data for the 1990 census round and for the 1980 and/or 1970 census rounds.

² Data exclude 149 Government holdings with 103 035 ha for 1989, and 192 Government holdings with 49 995 ha for 1980.

³ Due to lack of data for 1986–95, data from the 1985 Agricultural Census are presented.

One view (which I share) is that the challenge of the Chicago question can be met, credibly and testably, by pointing to capital-market information asymmetries that deny small farmers access to loans; interaction between land and other markets, giving large-farm owner-operators (but not to the same extent non-operating owners) power as employers, lenders, merchants, or politicians; and/or politics that provide better input or output prices, research access, farm water, or other advantages to big and powerful farm operators, partly because these are more likely to supply surpluses of savings, food, and labor to urban areas. Whether or not one accepts such reasoning, it is very much harder to answer intelligently the inverse Chicago question: if there is *not* an IR between farm size and unit (transaction plus production) costs in low-income and lower-middle-income countries—or if such a relationship is weakening, perhaps because supermarkets or grades and standards disfavor small farms—why is the proportion of farmland in the smaller size groups not only large but *rising*? Three plausible responses to the inverse Chicago question do not work.⁹

First, continuing growth in rural population, and hence over the generations in the number of rural households, may lead parents to split land among inheriting offspring. However, that is no reason why, if value added per hectare on smaller farms is lower than (or falling relative to) large farms, beneficiaries of partible inheritance should continue to farm ever-smaller farms. Smaller

⁹ We assume that total farmland cannot expand. Where it can, it is wholly incredible that high (and rising) proportions of land in small farms are consistent with their diminishing relative efficiency.

legacies of *owned* or *controlled* farmland do not imply rational choice of smaller *operated* farm size. Even if land sale and rental markets are weak, land can be left with relatives, or jointly farmed with neighbors, if bigger units are, or have become, more attractive as land uses.

Second, in the wake of the Green Revolution, rising farm productivity and a rising share of rural income from non-farm activity make it *possible* for a given farm household to subsist on less land. But this in no way makes it *sensible* for people to choose reduced farm size over time, if bigger farms are, or are becoming, more attractive land users. Moreover, on Boserupian lines, the growing number of small labor-intensive farms is likelier to *cause*, or accelerate, a labor-using and land-saving “induced” innovation pattern than to *be caused* by it. Anyway tables 1A and 2 show no sign that Asian and African falls in median farm size, and in the size of unit containing the median farm hectare, are sharper in countries with a faster “green revolution.”

Third, Valdés (pers. comm., July 2005) rightly emphasizes the attachment of farmers to their homestead plots, and the wish of rural households, even as they move out of farming, to retain small farmable units so as to cut risk, via both food security and diversified portfolios. However, such preferences neither predict nor explain a *tendency toward* smaller farm area, if its advantages are sharply falling. Further, especially if those advantages were actually negative—if the IR had been replaced by a DR between output per hectare-year and farm area—one would expect tiny landowners, if they wish to keep small farm areas for risk-averting reasons, to rent out operating rights. They increasingly do that in developed countries, and in the Indian Punjab, but not in most low-income and lower-middle-income developing rural areas (tables 1A and 2).

Adaptations to rising rural population, farm productivity, and non-farm incomes are, of course, slowed down by market imperfections, especially in land and capital markets. But it is highly implausible that—if larger farms mean more farm output per hectare, and hence more income to be shared, and are thus in the interests both of those seeking to farm more land and of those seeking to farm less—market imperfections can be sufficiently widespread and persistent to explain falling farm size. Yet that is what we find across a very large majority of the 30-odd intercensal periods (mostly around 10 years) in low-income and lower-middle-income developing countries in tables 1A and 2. (Recall that there are many ways, other than formal market transactions and other than force majeure, for people to change farm size toward what they seek.)

Summarizing: Standard economic “explanations” (population growth, technical progress, risk aversion) do not, in fact, explain why most low-income and lower-middle-income countries, for 40 years, have had high and rising proportions of farmland in holdings below 5 hectares, often below 2–3 hectares. Nor can “political economy” explain it: if anything, the power of large local owner-farmers (who are potentially also employers, lenders, and traders) points the other way. The most credible explanations are that smaller scale *either* is becoming relatively more advantageous to farmers *or* has for some time been so, but that policy or other distortions concealing that fact are being reduced. The first option—given that development brings rising ratios of fixed capital to labor, pushing UTC advantages from the smallest toward gradually larger farms—is unlikely (Hossain 1988).¹⁰ The second option, however, is plausible. Many developing countries featured either colonial land grab or the use of large farmers as tax and law intermediaries by the colonial power. After decolonization, land is often redistributed into smaller and less unequal holdings by land reform. Alternatively, decolonization enables market forces in labor-plentiful, land-scarce economies to bring about voluntary shifts of farmland to lower size groups.

The employment and food-entitlements reasons why small, equal farms are conducive to poverty reduction are familiar (IFAD 2001; Eastwood et al. 2006). The micro-evidence for the IR is consistent with trends in farm size in Asia and Africa. There is also evidence that great inequality of assets, especially land, is conducive in developing countries to slower growth of mean gross

¹⁰ However, rising ratios of *working*, that is, non-fixed, capital to (complementary) labor may actually favor smaller farms. Mahabub Hossain (1988) showed that, after the initial middle-farm lead in adopting new Green Revolution technologies had been removed by more widespread adoption, it was, as before, smaller farmers who show higher levels of fertilizer use per unit area.

domestic product (GDP) (Eastwood and Lipton 2002). Add to these efficiency and equity considerations the evidence on sequence—the normal dependence of early rural non-farm growth on prior consumer demand by nearby smallholders, and the standard connections between agricultural growth and industrial capacity to employ and import (Johnston and Mellor 1961; Mellor 1976; Hazell and Ramasamy 1991)—and it is not surprising that almost every low-income country to achieve sustained mass poverty reduction began with widespread productivity growth on small farms.¹¹ Despite the damage from OECD farm and trade policy to that process, it is not obvious either that the small-farm sub-sector has become inefficient compared to large-farm alternatives or that there is any other affordable way to raise employment rapidly, and hence keep real wages rising (and poverty falling), in most African and Asian countries, where supply of persons of working age is set to grow at 1.5 to 2 percent yearly to 2035.

There is also a political-economy link from small-farm growth to sustained mass poverty reduction. Higher and more stable farm income during industrialization raises the opportunity-cost and bargaining power of the rural non-farm sector workers and townward labor migrants.¹² (This is especially so, if the small farm provides not only a decent reservation income, but also a secure house and food; this modifies the generally correct argument that tenancy helps the poor and restraints on it harm them.) Real income growth on small farms, like land reform (Moore Jr. 1966), empowers the industrializing poor in open societies for non-violent advance—politically and economically.

What, then, is the role of agricultural science in alleviating poverty? Agricultural research in and for developing countries has huge and non-declining returns.¹³ When, as in the 1980s, such returns comprise mainly extra real value of output, the poor gain anyway: economic growth cuts poverty, but does so much more when it is agricultural growth. Even then, benefit to the poor is likely to be higher still, if the extra output appears as greater value of income for small farms.¹⁴ However, small-farm concentration of research and its benefits—a desirable “optional extra” for poverty reduction when developing-country research gains were felt mainly as real extra GDP—becomes an essential, as a growing part of such gains comes to comprise bare maintenance of agricultural GDP in the face of worsening physical production conditions and falling real farm prices.

As agricultural research has shifted from raising yields to defending them, so research benefits—while not falling (see footnote 13)—have shown up less in extra (agricultural) GDP and more in maintaining its existing level. Absent breakthroughs, raising yields on the scale of the maize hybrids (1940–1960) and the wheat and indica rice semidwarfs (1963–1985), breeders have increasingly concentrated on maintaining yields. This has been essential to counter both new pest biotypes evolved to attack a range of genetically similar cultivars over huge areas and water and soil nutrient depletion caused by intensive, repeated cultivation of such cultivars (and their temporarily profitable spread into marginal lands). This is consistent with the sharply falling trend growth of crop yield (and farm output) in developing countries.¹⁵

On top of this, there has been a downtrend (about 0.4 percent a year for the last 40 years) in real farm prices. This increasingly shifts the benefits of research from producers to consumers. That helps those of the poor who are net grain buyers: townspeople, farm laborers, and some deficit farmers. But how can one advance poor *producers* as a whole in these circumstances? One

¹¹ Korea is often wrongly cited as a country where manufacturing growth preceded agricultural acceleration; in fact the latter began in the 1930s. The city-states of Singapore and Hong Kong based their growth spurt on entrepôt gains from previously increased trading capacity due to farm growth in a “foreign,” rural hinterland.

¹² Hence the imposition of poll and cattle taxes to press African peasants to work for colonial employers.

¹³ Meta-analysis of several hundred studies of economic rates of return on agricultural research shows that, in and for developing countries, the rate is typically well over 25 percent and has shown no trend between the 1960s and the 1990s (Alston et al. 2000).

¹⁴ Partly because the poor are then likelier to get income from land and enterprise, but mainly because labor demand per hectare is much higher in smaller farms (Eastwood et al. 2006; Booth and Sundrum 1985). This is true even of demand for hired farm labor; also, increased small-farm incentives (due to research-based TFP rises) normally switch deficit farmers' labor to their own farms, away from hired labor markets, thus improving wage and employment prospects for landless rural laborers.

¹⁵ For staples, a big majority of developing-country crop area and value, from 3 percent in the period 1975–1985 to 1 percent in the period 1995–2005 [FAOSTAT].

approach is to reduce the effect of research-related growth in farm output on market supply, and hence on prices, by steering research gains to those with high income elasticity of demand for food staples. That means food-deficit farms (which will use research to grow extra staples likely to be eaten by producing households) and/or farmworkers (who benefit most, per unit of research, if it is adopted by labor-intensive small farms).

3. Conditions for Technical Progress to Cut Poverty: The Role of Small Farms

To understand how small farms fit into the nexus between science and poverty reduction, we should start with the greatest success of anything (let alone of science) in reducing poverty by any means (let alone just via farming): the Asian–Latin American Green Revolution of 1963–1985 (Kerr and Kohlavalli 1999; Hazell et al. 2001; Lipton with Longhurst 1989). Can the same trick be turned for the remaining poverty heartlands in coming decades? There are big differences—in significant part due to the Green Revolution itself—between “then and now” in poverty, agriculture, national and global economic policy, and the content and organization of science. Hence success may be more (or less) costly and difficult, and will require changes of tactics.

This section has three aims:

- First, it uses Green Revolution experience to illustrate neglected requirements for technical progress to help *all main groups* of poor: small farmers, farm laborers, and the non-farm (including urban) poor.
- Second, it shows that the Green Revolution—despite being (for all its scientific brilliance) informed by a mechanistic view, more wrong than right, of how crop science cut poverty and hunger—*happened* to meet the requirements for cutting them massively, partly by luck, partly because the scientific institutions were flexibly managed and not mainly profit orientated.
- Third, the section infers that such luck cannot be relied on now. For science to massively cut poverty through farming—which still almost always means working with small farmers—research planning, in today’s world of science, poverty, and agriculture, must address, much more explicitly than during the Green Revolution, the impact of potential outputs (new varieties, techniques of farming, water use, and natural resources management) on the problems of main poverty groups.

The aim of the Green Revolution was to increase the size of “the pile of rice,” and to some extent wheat, faster than impending population growth. The strategy was set out for India in a classic Ford Foundation document in 1959.¹⁶ Following major irrigation spread in the 1950s, and corresponding rises in both gross cropped area and fertilizer use, it looked in 1959 as if modest further rises in foodgrain output could be achieved by extension of known improvements, but that no strategy existed for meeting the extra grain requirements of India’s impending population growth at 1959 levels, let alone for substantially reducing pervasive malnutrition or meeting extra requirements due to income growth and urbanization. The strategy proposed was science-based improvements in rice and wheat plant types. The financiers and planners of the Green Revolution advocated a similar approach for most of Asia, and indeed for much of the developing world.

The upstream science and initial breeding were located in the international public sector—spearheaded by the forerunners of the Consultative Group on International Agricultural Research (CGIAR) system, the International Rice Research Institute (IRRI) and the International Maize and Wheat Improvement Center (CIMMYT)—and its wide-spectrum improved varieties were to be adapted for local use by public-sector national agricultural research systems (NARSs), mainly in Asia and Latin America.¹⁷ The varieties were to go initially to securely watered areas, and were expected

¹⁶ *Report on India’s Food Crisis and Steps to Meet It*, by the Agricultural Production Team sponsored by the Ford Foundation, Ministry of Food and Agriculture and Ministry of Community Development and Co-operation, New Delhi, April 1959.

¹⁷ That was the model; some NARSs, such as those of India, Mexico, Brazil, and above all China, were, or became, much more upstream than the model suggests.

to be used, at least initially, by middle-to-large farmers, responding to radically improved germplasm by buying more fertilizers, extra double-cropping, and more precise water control (more groundwater use especially) to deliver large surpluses for sale. Benefits for nutrition and poverty reduction were of course wanted but were seen as being achieved by winning a quasi-Malthusian race between people and foodgrains. It was argued that the breathing space would be used (contrary, of course, to Malthus's economics *and* ethics) to spread voluntary birth control.

How could this work? Almost everyone now agrees that most hunger and poverty (like most famine) (Sen 1981) is due to “failures of exchange entitlements,” not to “food availability deficiency.” How did the Green Revolution have the luck to succeed in raising income-based entitlements, when its goal (and its triumph) was to raise food availability? Answering that question will do much to clarify the conditions for farm research to be helpful, or more helpful, to all three main groups of dollar-poor: small farmers, farm laborers, and the non-farm poor. To raise income-based entitlements for all three groups, science-based agricultural change must—and the Green Revolution, without being planned that way, did—walk two tightropes, that is, satisfy two conditions.¹⁸

1. The price/total-productivity tightrope: For new science to help poor farmers and poor food consumers (a lot), it must cut staples prices (a lot) but must raise total factor productivity (TFP) on small farms (a lot) faster.¹⁹ New science usually raises farm supply of outputs and demand for inputs. That makes outputs cheaper and inputs more expensive; hence the ratio of farm output prices to input prices falls.²⁰ Do small and poor farmers gain? If, and only if, this science-induced fall in their relative farm prices is slower than the science-induced rise in their conversion ratio of physical inputs into physical outputs (that is, TFP).²¹ Yet, unless the extra food brings the price of staples down, the non-farm poor, especially in towns,²² gain little or nothing from new crop science. Walking this tightrope successfully means addressing two demand issues: (a) Is there enough demand, for extra staples produced by agricultural research, to avert price declines that would unduly cut research gains to small farmers? (b) How can the poor afford this extra food? *It is easier to walk this tightrope if many of the research adopters are food-deficit small farmers.* These, a big majority of the rural poor in most of Africa and Asia, spend large parts of extra income on more (and better) staples. So they eat much of the extra food themselves.²³

2. The wage rate/labor-land-productivity tightrope: In the early stages of development out of mass poverty, for new science to help poor farm laborers (a lot), it must raise output per labor-hour (a lot) but output per hectare [and, where water is constraining, per liter] (a lot) more. In a substantial and increasing majority of farming situations in developing countries, there is hardly any “spare” farmland worth cultivating.²⁴ With A (area of

¹⁸ The rest of this section draws on Lipton 2005.

¹⁹ Meeting the condition is one escape from the agricultural treadmill. The case is clear if farmers grow only food staples. New staple-crop science can cut staples prices somewhat more sharply than it raises staples TFP yet still help poor farmers, if they can then profitably shift some land into cash crops.

²⁰ Globalization means that farm prices are increasingly determined on a world scale, but transport costs (especially in Africa and for staples) and remaining state price interventions remain high enough that rises in most countries' domestic farm output changes—and research inducing such rises—still have a major impact on national prices.

²¹ The condition is somewhat modified for staples produced by poor farmers who eat almost all they grow.

²² Some rural non-farm poor can gain from higher demand for local non-farm products (especially construction, retailing, and transport) by farmers as their poverty recedes.

²³ How can a deficit farmer buy more inputs, even if research makes them profitable? Once research has raised her productivity when growing staples—and thus cut her staples deficit—she needs less money for staples purchases and can divert some of it to buying new inputs. Where does the money come from? Deficit farmers normally get much of their income from nonfarm activities or remittances. However, there is a credit problem in the early years of input-driven productivity growth.

²⁴ Africa is often seen as a continent of ample land and scarce labor. That was true 50 years ago, and a few places remain where smallholders leave decent arable land unfarmed because they lack enough labor to break, prepare, or weed it. But that has come to apply to ever fewer regions. Most areas, with long-continuing and ongoing rural population growth but few gains in land productivity, have arrived at or close to the “extensive margin.” New land can be farmed only with sharply rising break-in costs and environmental fragility, yet sharply falling net annual returns. Employers always allege “labor shortage”; but in most of Africa the move from rural unemployment, low productivity, and low wages into genuinely tighter labor markets, as land-intensifying technical progress bids up the demand for labor, is the essence of both rural development and poverty reduction.

farmland) fixed, L (use of farm labor) can rise only if output per unit of area (Q/A) grows faster than output per unit of farm labor (Q/L): hence the above condition for total demand for farm labor to rise, pulling up employment or the wage rate. As and where the water constraint becomes binding upon profitable growth of farm output, this sentence also applies if we substitute H_2O for A .

The condition is more demanding if farm labor supply grows. Population of prime working age (15–64 years old) is set to rise at some 2 percent per year in most of South Asia and Sub-Saharan Africa for the next 10 to 20 years, and by more than 1 percent even in rural areas. For farming to help raise demand for labor faster than supply, with farmland scarce, scientific advances must raise output per hectare by at least, say, 1.5 percent per year faster than output per worker, to be all-round poverty reducing. So research output must be more, better, and *better planned*—but it is then well placed for high poverty-reduction gains per unit of research, because “high 15–64” families and nations have the best chance to work and save their way out of poverty. The ongoing “demographic transition” in Africa and South Asia provides a once-only chance to use the rising ratio of workers (and savers) in the next 20 to 30 years to “make (extreme absolute) poverty history” as large parts of East Asia did in the 1965–2000 period²⁵—before aging populations drive dependency ratios up again and make poverty reduction much harder. But parlaying demographic gifts into poverty eradication requires generating more food and more labor demand where they are affordable and needed. In East Asia from 1965 to 1990 that required, as it will in much of South Asia and most of Sub-Saharan Africa from 2005 to 2040, greatly enhanced research that walks the two tightropes.

Tightrope 2 does not mean that agricultural research in poor areas can disregard output per worker. It too must rise significantly. First, its desperately low level is what makes poverty heartlands that way. Second, they are also kept poor by low labor productivity, which deters farmers and others from hiring more labor, thus retarding the poor’s wages, employment, and bargaining power. Third, higher labor productivity is especially important in areas facing acute seasonal labor scarcity—most common in Africa, particularly when hoeing is needed; unless this is addressed, severe yield losses can occur due to late planting. Such conditions are partly due to lack of water control and robust crop varieties that can withstand moderately late or scarce rains.²⁶ Fourth, HIV/AIDS severely depresses local labor supply in parts of Africa. Research needs to raise labor productivity, especially in peaks, but it cannot help those afflicted by HIV/AIDS to cut the demand for poor people’s labor! Agricultural research, with land and water limited, will seldom cut poverty much without raising their productivity faster than labor productivity. Otherwise, farm employment demand must fall. Only much further into the process of development and rural poverty reduction, when non-farm growth and emigration have pulled wage rates up, should researchers—like farmers—seek to raise labor productivity faster than land productivity. Meanwhile overt rural unemployment—rightly downgraded for empirical reasons in the 1960s as a policy concern—is a rising source of poverty in many developing countries, even some with rapid overall growth, due to a rising workforce alongside declining agricultural growth and labor-intensity: unemployment is patent (and much researched) in South Africa and several other African countries, on a sharp uptrend in India²⁷ and coming onto the policy agenda in China. With agriculture still the main income source of greater than 60 percent of the developing world’s workforce (and more than 70 percent of its poor), rising rural unemployment, and India “pointing to the future” with labor the main income source for twice as many of its agricultural poor as own-account farming,²⁸ agricultural research can no longer claim to be targeting poverty unless it explicitly aims to raise land and water productivity substantially faster than labor productivity.

Temporary, local, and anti-developmental labor shortages are of course part of the disaster of HIV/AIDS; however, were these to induce long-term labor-displacing and hence wage-reducing investments or policies, the disaster would be compounded.

²⁵ “In 2000, there were 94 dependents for every 100 people aged 15–64 in Ethiopia; the projection for 2030 is 67. Over the same period, the dependency ratio is projected to fall from 99 to 67 in Nigeria, from 79 to 55 in Bangladesh, and from 71 to 58 in India. These are recent UN estimates, taking account of HIV/AIDS” (Lipton 2005). On East Asia, see Bloom and Williamson 1997.

²⁶ In such areas research might prioritize raising labor productivity at the peaks but land productivity in the slack season.

²⁷ The time-rate of unemployment rose from 6 percent in 1993–1994 to 7.3% in 1999–2000 despite fast economic growth, and, if this continues at 6.5 percent per year, it is scheduled to rise to 14.5 percent by 2021 (Dyson et al. 2001).

²⁸ S.Tendulkar, cited in (Lipton 2005).

The Green Revolution, after a faltering start and with different objectives, came to increase the entitlements of all main groups of the poor—deficit farmers, rural laborers, urban poor—by “walking the two tightropes,” and it was, at worst, neutral among farm-size groups. This was not wholly luck. Early critics—and many farmers—stressed the need for more robust varieties, to reach both “difficult” regions and risk-averse poor farmers. Public-sector, public-purpose researchers addressed such criticisms (Lipton with Longhurst 1989), where private counterparts would have been pressed to focus on better-off, more secure customers.²⁹ However, brilliant as the science was, it was also lucky that the Green Revolution semi-dwarfs proved so amenable to crossing for better resistance to main pests and diseases—and that successive semi-dwarf varieties walked the two tightropes.

The new seeds let small, dollar-poor farmers turn their few resources into much more output of staple food. TFP far outpaced the fall in staples prices relative to the prices of inputs.³⁰ For dollar-poor farmworkers, larger harvests, more water control, and more fertilizer use all raised labor productivity somewhat—but land and water productivity much more. Therefore, demand for their labor rose significantly, while their staples requirements became cheaper.

The urban, and rural non-farm, dollar-poor gained from the restraining effect of the extra staples output, generated by the Green Revolution, on the price of food staples; and the latter group also gained from expanding local small-farm demand for consumables (Hazell and Ramasamy 1992). So all main groups of dollar poor saw their entitlements to food staples—typically absorbing more than half their incomes—substantially raised by the Green Revolution. These effects were partly luck and partly serendipitous adaptation of breeding goals *ex post*. Careful prioritization *ex ante* is needed if pending research—before and after the coming biotechnology breakthroughs in food staples—is to bring big benefits for all main poverty groups.

Nor can we expect research findings today, *without careful research planning*, to emulate another feature of the Green Revolution, especially in its later years (1975–1985), helpful to all three main categories of poor, including small farmers: its generally risk-reducing reduction in the year-to-year instability of food entitlements. More pest- and disease-resistant seeds, constantly adapted by researchers to resist new plant biotypes, reduced year-to-year variability of farm output and, as a result, of demand for farm laborers.³¹ That also reduced price fluctuations for consumers (as well as producers), as did the larger levels of public and private stocks made possible by output increases. Seasonal variability also declined to some extent, because the new seeds were increasingly able to produce short-duration or multiple crops in some conditions.

What of the poor in regions (and nations) bypassed by modern agricultural science? Asia’s Green Revolution, from about 1975 to 1980, increasingly spread into hitherto untouched regions, raising and stabilizing entitlements there also for the dollar poor as small farmers, farm laborers, and urban employees. Researchers generated results for water environments less ideal than the irrigated deltaic and canal flatlands that benefited in the 1964–1975 period. Today, in both China and India, the return to crop science is higher in *some* “backward” regions than in the lead areas of the Green Revolution, where dollar poverty has fallen much more sharply (Fan, Hazell, and Thorat 2000; Fan, Linxiu, and Zhang 2000). Further, a fast-rising proportion of the remaining poor is concentrated in these “backward” regions, where natural increase is considerably higher, net emigration lower, and

²⁹ The biotech revolution is more private-sector based than the Green Revolution (and its critics are more fundamentalist). Much institutional and incentive work is needed for biotech to “rerun” the Green Revolution’s adaptability to poor farmers’ needs.

³⁰ Major steps were taken in East Asia in the 1970s and South Asia in the 1980s to make competitive credit available to some small farmers and to reduce extraction via parastatal and trade-based price manipulation by governments. Speeding Africa’s slower progress in this direction is a major part of the few recent successes in spreading science-based agricultural progress there.

³¹ Hazell has shown that, in earlier years, the cereals-output destabilizing effects of India’s Green Revolution via increased covariance (among output-weighted grain production sites) outweighed the stabilizing effects via decreased within-site variance. The balance was reversed, with stabilizing effect, after 1975 as semidwarfs spread to a much wider range of areas—and it was this, not the early Green Revolution to 1975, that brought the first big thrust of India-wide poverty reduction (Smith and Urey 2002).

governance often worse than elsewhere—and where the poor’s dependence on agriculture is more.³² However, while public-sector systems have often concentrated their efforts on such “pro-poor-region” goals as high yields in upland rice and in drought-tolerant maize, the incentives for increasingly privatized research to do so are weak. Moreover, in *other* “backward agricultural regions”—including many where the above two goals are crucial—rapid research progress probably depends on transgenics. The local genetic range of current crops has been selected for survival under stress. Both for the evolving plant and for the selecting farmer, over many centuries high yield has been a much lower priority than it is for populations facing today’s land and water scarcities. Yet—without at all decrying the big contributions made by multinational seed companies to improving poor people’s staples—that is not the priority (least of all for “backward” regions) of 90 percent of transgenics research today. Incentives can be changed; public transfers (and not only farmer royalties) should become a major competitive income source for private seed developers. However, until that happens, there are severe limits on sensible research planning to walk the two tightropes, cut risks, and steer farm research to reducing poverty among all three main groups of poor.

Progress in many “backward” regions requires better water control. Growth by this means, especially via double-cropping and higher-value crops, almost always meets both tightrope conditions, but it too is limited—by increasing water shortages, especially in semiarid areas. Where there is irrigation already, standard water reform—pricing, markets, user groups—is part of the solution, but the elasticity of the poor’s farm output and income to “reform” will be small, absent new science—hydraulic, not just agricultural—to improve economic efficiency of water use. Otherwise—apart from threats to irrigated farmers from salinity and falling groundwater tables—many farmers, irrigated and rainfed alike, will be further imperiled by the “urbanization” of water and by rising evapotranspiration rates due to global warming.

On present form, it is the poorest farmers who will bear the brunt of a worsening rural water shortage. Yet much *more* small farm irrigation, not less, is needed to address most rural poverty in Africa (and parts of “inner Asia”). On a generous estimate, 4 percent of cropland in Sub-Saharan Africa—most of it on not-very-small farms in four countries—is water-controlled, as against 40 percent in South and East Asia. That alone explains much of the difference between the regions in crop research progress and poverty reduction. Probably, rapid poverty reduction in much of Sub-Saharan Africa requires a lot more irrigation. Farmer-controlled micro-irrigation is a great idea, but *absent prior development of wells or macro-systems*, it spreads among farms very slowly (IFAD 2001). Much more major irrigation, however politico-greenly and hydraulically incorrect, is needed. Some can exploit currently underused water bodies, but much will come from sources competitive with urban uses. To be sustainable and economic, such developments will need new water science.

4. Some Priorities for Poor-Friendly Research Reform³³

How can research generate more of the “helpful” technical progress—and less of the “harmful” sort (e.g., reducing demand for labor without making food cheaper)—for deficit farms (as well as for other groups with high poverty incidence, by walking the two tightropes), and for the growing proportions of poor people in “difficult” regions? Who should do it? For what sort of incentive? What kind of technology can or will be able to improve smallholder access to key resources and inputs, such as water, seeds, fertilizer, and pest management?

Formal science is increasingly needed to generate new technologies that will keep demand for labor growing faster than supply, and TFP growing faster than the ratios of input prices to output prices. During the millennia without sharp secular population growth, and with most farm output consumed locally, these tasks were much less demanding than they are today. Hence on-farm research sufficed in most areas, with farmer-to-farmer and area-to-area spread of experiment and innovation. This worked even after “revolutionary” changes in the concepts behind local farm

³² For India, Dyson et al. (2004) show the heavy past and projected concentration of poverty into such regions. On China, particularly the slower rise of the rural non-farm share in such regions, see Lipton and Zhang 2005.

³³ This section draws on Section 4 of Lipton 2005.

technologies: the Neolithic, medieval, and early modern agricultural revolutions (Lipton with Longhurst 1989). Even in recent centuries, farmers' innovation usually sufficed to keep pace with population while it grew at up to 1 percent yearly (Hill 1977).

However, in the population acceleration of 1730–2000 (and as unfarmed quality land became scarce), poverty reduction increasingly required TFP-increasing technical progress to be faster, more yield-enhancing, and employment-intensive. To achieve this, farm-based innovation remained necessary, complementing (but increasingly elbowed out by) formal, off-farm science.

The content of science has also changed. Better natural resources management (NRM)³⁴ continues to be important, but less so relative to formal inputs—and increasingly *induced* (made more profitable for farmers) by such inputs, rather than *introduced* by supply-led NRM innovation, extension, or even research.³⁵ Since the 1730s in Europe, and most dramatically since the early 1960s in Asia, it has been increasingly formal, science-based water control, inorganic fertilizers, and plant breeding that allowed TFP improvements to outpace population growth and land/water depletion.

While good farm research always hears farmers' voices and builds on their experiments, it is not just client induced or demand driven. Whether it has something to deliver to poor farmers, farmworkers, and staples consumers depends also on prior development of basic science and incentives to applied science. As for science, Mendelian genetics supplied a basic model for applied Green Revolution breeding. As for incentives, though private profitability induced mainly labor-saving research (Binswanger and Ruttan 1978), public-purpose, not-for-profit finance made it pay—professionally and financially, not just ethically—for scientists to implement the Green Revolution model, and hence, albeit helped by luck (see above), to attack poverty. From the late 1960s, the emphasis moved increasingly to further applications of Mendelian genetics (with plant pathology, entomology, and so on) to immunize successive new varieties against successive new pest biotypes (though with less success against abiotic stresses) and to spread them into some less favorable environments.

As indicated, the Green Revolution has slowed sharply, as has yield growth, since the 1980s, without doing much for scores of millions of small family farms with little water control, especially in Sub-Saharan Africa. There, leading varieties and land races of the main staples (white maize, millet, sorghum, cassava, and yams) are probably low-yielding because evolutionary rewards (and farmer selection) over many generations have gone less to high-yielding varieties than to varieties—and indeed crops—able to tolerate low nutrient inputs, severe and variable moisture stress, and locally dominant pests (from quelea to striga) that have received less attention from plant breeders or other researchers than have insects, fungi, and viruses.³⁶ Neither conventional nor (heavily privatized) transgenic plant breeding is substantially directed toward such issues. How are the tasks and organization of farm science to be reformed to improve pro-poor results, with growing majorities of the poor in water-insecure areas largely bypassed by the Green Revolution—especially for the crops and soil-water regimes of rainfed Africa?

Can new crop science fill the gaps in less-favored areas? The Green Revolution could not escape the law of diminishing returns. The best areas were covered first, and the low-hanging fruit of scientific advance plucked first: what is left usually³⁷ yields less. Despite success in parts of rainfed Asia and some of Africa (mostly maize hybrids), past evidence suggests severe limitations on

³⁴ NRM is farmer-led agronomic control of nutrients, water, and biota (e.g., organic manuring, valley-bottom micro-irrigation, terracing, crop rotation and mixing, and removal of insect egg masses).

³⁵ Though the CGIAR has shifted substantial resources from plant breeding to NRM since the early 1980s, evidence of a high rate of return is much clearer for breeding than for NRM, other than integrated pest management (World Bank 2004a).

³⁶ For many African situations, it is claimed that good improved cultivars are available, yet farm-to-station yield gaps are huge (anecdotal evidence claims 90 percent for maize in Malawi). The Herdt-IRRI Asian gap studies, however, suggest that in Africa too, since farmers are no fools, economic yield gaps are much smaller and the new varieties much less suited to actual field conditions than claimed.

³⁷ Some areas, however, were agriculturally backward because they were neglected by applied science, not recalcitrant to it. In both China and India, some “backward” areas now offer more growth, and more poverty reduction, per extra dollar of crop research than do the conventional lead areas (Fan, Hazell, and Thorat 2000; Fan, Linxiu, and Zhang 2000).

conventional plant breeding. Not only has this slowed down sharply, but also most of its recent successes seem relevant mainly to water-controlled areas (for example, the “new plant type” of rice). Further, some features of Green Revolution farming slow down, or even reverse, yield growth: water table lowering via ever-deeper competing tube wells; micronutrient depletion; monocultures reducing biodiversity yet stimulating low-level buildup of new pest biotypes;³⁸ and restrictive responses to over-concentration of pesticide residues, and fertilizer-derived nitrates and nitrites, in water sources shared by humans and plants. Yet returns to staples breeding are high and have not fallen since the 1970s [Alston et al. 2000]. This is consistent with the slowing growth of staples yields, but the two together imply that research based on the Mendelian breakthrough has increasingly had to focus on maintaining yields rather than raising them.

More promisingly, the basic-science breakthrough by Crick, Watson, and others in 1954 is feeding into a key complement to conventional plant breeding: transgenics. In principle, this permits the identification, and insertion into African crops hitherto evolved or selected for characteristics competitive with yield, of yield-favoring DNA sequences from other plants (or other life-forms). Unlike the Green Revolution, however, research in applied biotechnology is largely owned, exploited, and motivated privately. Private firms must recover costs plus profit from farmers. That explains the concentration of transgenics on open-pollinated crops (and a few F1 hybrids of self-pollinators), large and visible farmers, crops and traits preferred by wealthier consumers, and in general the (so far) not very poor-friendly priorities of most plant biotech. Herbicide resistance, valuably labor saving in rich and labor-scarce developed rural areas, is likely to be poverty increasing where weeding is mostly done by laborers who, if displaced, cannot readily find other work at comparable wage rates. *Bacillus thuringiensis* (Bt)–based resistance (for example, to corn borer and bollworm), while surprisingly stable so far, remains vertical, and thus high risk for small farmers without ready emergency access to alternatives if the pest develops a new biotype. The main staples grown and eaten by the world’s poor (including white maize)³⁹ have largely remained “Cinderellas” of transgenics research, though China, where this research is largely public sector, may create major exceptions.⁴⁰ Can new basic science, organized and applied as crop and field technology, serve poverty-reduction goals and complement conventional plant breeding and non-crop farm science to focus on yield enhancement and robustness promotion for main staples in rainfed areas? There are institutional and scientific issues.

Institutionally, the organization of crop science has become less adapted to eradicating poverty among family farmers. In the early Green Revolution, international agricultural research centers, and national centers in many Asian and Latin American developing countries, delivered a steady stream of high-yielding and pest-adapted varieties of rice, wheat, and maize, mainly for water-reliable areas, but raising incomes of poor farmers, laborers, and food consumers. But after 1980 public-purpose farm research funding fell (except in parts of Asia), was tied ever more tightly by donors to “restricted” areas and topics in ways that inhibited planning by researchers, and was diverted by donors away from crop improvement toward a series of less productive, and sometimes fashion-driven, aims. Moreover, an increasing proportion of frontier work is now in applied biotechnology. In sharp contrast to Green Revolution research, perhaps 90 percent of such work is now in a few big companies, which naturally protect their research, including plant varieties. Since 2000, there have been improvements. There have been moves to refocus the CGIAR, to increase its involvement in biotechnology (including transgenics), and to reverse the long fall in well-targeted resources for public plant breeding.⁴¹ There has been talk (and some action) on public-private

³⁸ Breeders have largely kept ahead of new epidemics (though there have been nasty shocks—for example, with rice, the tungro epidemic in 1972, and new biotypes of brown planthopper). However, a few adapted pests, each causing small but significant crop losses, probably explain part of the fall in yields, with controlled water and nutrients, in IRRI research fields and in farmers’ fields in the Indian Punjab.

³⁹ This is changing in some research centers, national (e.g., transgenic maize resistant to streak virus at the University of Capetown) and international (e.g., maize at the International Institute of Tropical Agriculture, rice at IRRI, sorghum and chickpea at the International Crops Research Institute for the Semi-Arid Tropics, and so on).

⁴⁰ We have been waiting for months for China’s “imminent” release of Bt rice, plainly in the interest of its poor farmers and consumers, but suspect with some non-governmental organizations and potential European importers.

⁴¹ This is, rightly, a not-so-hidden agenda for the Challenge Programmes.

partnerships; and generous, if marginal, poverty-related uses by big biotech companies of a few percent of their resources.

However, if private transgenics is to complement public purposes and to address the needs of the poor, a more radical approach is needed. Private companies need to see public-purpose research outcomes as made profitable, not mainly by private royalties from farmers or by public relations spin-off, but by contracts to achieve specific outcomes that will raise family farm productivity or robustness, especially for staples, in neglected areas and crops. One of many possible contracts might require development of maize hybrid or composite populations, viable and profitable over stated areas (with known pest populations) in Africa, meeting targets for (a) capacity to resist delayed rainfall (latency) at the time of anther formation, (b) yield, and (c) field spread to small farms. Such contracts should be competitively awarded; engage, and perhaps be designed by, public agricultural research institutions, jointly with end users; focus on applicability in low-income countries committed to genuinely additional research co-financing; but otherwise be mainly financed by aid. Present alternatives are unpromising.

As an economist I have no locus standi to assess natural-science (rather than institutional or economic) priorities. There is recent evidence that, even with existing inadequate incentives, biotech companies can generate transgenics-based crop science to address key unsolved problems of the farming poor (Nuffield Council on Bioethics 2004).⁴² However, its applicability is squeezed between (a) the shortage of new water science, and (b) the farming poor's intensifying water crisis (see above). Transgenics-reinforced crop science may well improve resistance to moisture stress and, later, perhaps (polygene) water-to-output conversion efficiency (Nuffield Council on Bioethics 2004, esp. #3.42). Yet this must be complemented not just by water-market and institutional change but also by new basic water science and engineering: the first blue revolution for 2,000 years.

It would be a risky folly to assume that the lucky conversion of increased food availability into increased food entitlements for all the three main dollar-poor groups, achieved by the Green Revolution in parts of Asia and Latin America, will carry over into the biotech-based, water-economizing attack on poverty that is needed in those areas of Africa and the Asian interior lacking adequate water, or where reliable water control is uneconomic. Radical scientific and institutional innovation is needed. However, tearing down institutions, and locating and building new ones, is seldom a cost-effective path. It may also camouflage key issues, both of the content of science needed for rapid poverty reduction and of relations between public-purpose research institutions, their sometimes flighty and fashion-driven funders, and outstanding but "misincentived" private-sector researchers. Also, though one seldom attends a CGIAR meeting without observing the clear goodwill of the institutions toward poverty reduction, much clearer substantive anti-poverty guidelines are needed in research planning.

The "two tightropes" are a start (they would have released *aid* resources, misdirected toward, say, mechanical rice transplanters, combine-tolerant tropical wheat, or herbicide resistance, for better uses). But regional guidelines are also needed, as is integration with water-related research (not just the excellent work of the International Water Management Institute). Underlying all this is the need to reverse the recent downgrading of economic analysis in some CG institutions (and, even more important, to remedy its near absence from some key ones in NARSs) and to redirect such skills away from ex post complaining about research results toward direct involvement, alongside natural scientists, in research-planning choices. For example, economic and survey research into the diets, deficiencies, and requirements of the poor—and the costs and benefits of change—has achieved the redirection of work in nutrition breeding away from the Great Protein Diversion toward essential micronutrients. Obviously none of the groups involved—breeders, nutritionists, economists—can attack this problem, so central to the welfare and productivity of the poor, except by co-operating with the other two groups. Similarly only economists, crop scientists, and hydrologists, working together,

⁴² They include widespread smallholder adoption of Bt cotton, Chinese and Indian public-sector biotechnology, Monsanto's release of data on the rice genome, and Syngenta's release of patents for provitamin-A enriched rice, rice, that can be produced only with transgenics and addresses a key nutrition problem affecting millions of poor people.

can attack the central and difficult issues of crop-water research planning for maximum gains to the increasing numbers of poor small farmers in water-insecure areas.

5. Globalization, Plant Science, Small Farms, and the Poor⁴³

In the narrow economic sense, globalization involves (a) the secular trend, however incomplete and interrupted, to de-restrict international flows of goods and services,⁴⁴ money, labor, and investment, and hence science and technology; (b) the consequently rising share of international flows in total flows; and (c) the further result that trade and investment outcomes, including research patterns, are increasingly determined at world or individual levels, and decreasingly at national levels.⁴⁵

What is the interaction between family farming, poverty, and crop science in the context of narrowly defined globalization? Freer trade induces specialization along lines of comparative advantage—that is, in products using a nation's more plentiful resources (others being more readily, and more cheaply, importable). Also, freer foreign investment flows will be attracted to a nation for production lines that use those plentiful resources. Most developing areas are labor-rich and capital-poor. So most globalization⁴⁶ should raise their specialization in high-employment farms and crops. That should make it easier to attack mass poverty through extra employment, productivity, food output, and income growth from small family farms. Growth effects apart, globalization should, within developing countries, make income distribution more pro-poor.⁴⁷

Furthermore, freer trade and direct investment expose countries to more learning—about technology and markets—and to more participation in frontier science and technical progress.⁴⁸ In developed countries, freer international flows of trade and direct investment (while still raising GDP via specialization and learning) steer resources away from lines of production using a lot of unskilled labor and can thus harm distribution, unless poor losers are up-skilled, resettled, or otherwise compensated. This issue is crucial for farm reform in OECD countries. But such freer flows in labor-surplus developing countries can be expected, barring severe distortions or restrictions of access, to be clearly pro-poor.

So what went wrong? Few supporters of globalization claim that it has proved equalizing within developing countries. There has been widespread and growing inequality, and worsening transmission of growth into poverty reduction, in most developing countries during accelerated globalization (though not necessarily because of it) (Cornia et al. 2004). The poor as producers and laborers often seem to gain little, and sometimes to lose, perhaps especially in agriculture.

There appear to be three main reasons. First, some small farmers and farmworkers are overwhelmed by competitive imports and unable to change their product mix, either within farming or (being immobile and without basic education) toward manufacturing or services (Wood 1994).

⁴³ This section draws on Lipton 2005, Section 11.

⁴⁴ A highly significant consequence is the removal of obstructions to the “law of one price,” and hence a leveling of prices, allowing for transport costs. This highlights the non-globalization of agriculture by OECD nations and the plea from developing countries that they too be allowed to compete!

⁴⁵ In addition to the economic implications of globalization, growing proportions of ownership, power, tastes, and cultures transcend national borders. This widens choices for some people but also, many fear, homogenizes local cultures and—ironically, given the supposed alliance between decontrol and globalization—increases the control of global outcomes by dominant world or regional powers, companies, or cultures.

⁴⁶ This includes investment by transnational corporations (TNCs). As Western complaints about call-center outsourcing show, TNC investment leaves rich countries for developing countries partly to exploit low labor-costs, but in so doing it bids up wages and employment, cutting poverty. This does not justify financial liberalization (Stiglitz 2003). “Hot money,” absent strong regulated financial institutions, can destabilize growth, making the poor more vulnerable.

⁴⁷ There are caveats. Transferred technology may favor production that is intensive in its use of skills or capital rather than the labor of the poor. The small share of private international investment reaching the farm sector, and the negligible amount benefiting family farms, militates against major poverty impact. And the poorest may be insufficiently educated to make use of new opportunities (as is also a danger with freer trade [Wood 1994]).

⁴⁸ It is vital, however, that developing countries (public and private sectors) can and will select the more labor-intensive and hence appropriate science, techniques, and lessons from the usually rather capital-intensive mix used, and hence offered, by the capital-rich developed world, with which developing countries increasingly interact during globalization. This is central to the pro-poor use of crop science in a globalizing world.

Second, institutional changes linked to globalization—supermarkets, grades and standards, and so on—sometimes appear to help big farmers out-compete small ones. Third, in large countries (or those with costly internal transport), globalization has helped initially richer coastal areas, able to capture trade (and foreign investment), to out-compete the already poor interior regions. These factors can even mean that the poor and labor-intensive not only gain less than the non-poor from globalization, but may even lose more from increasing inequality than they gain from faster growth. Are such losses likely to be predominant or even inevitable?

There is no space here to review the massive and controversial evidence, but on balance it suggests that since 1980 developing countries that liberalized trade faster enjoyed faster growth, bringing faster poverty reduction—but not pro-poor shifts in income distribution. This is probably because, while preaching freer trade to an increasingly persuaded South, the North increasingly⁴⁹ supported its own agriculture. Therefore, gains to labor-intensive family farmers in the South from globalization were impeded by the steady undermining of farm prices via subsidies to Northern overproduction and by the responses of science to such incentives. Asian net food importers in the 1960–1985 period overcame this impediment because the Green Revolution raised TFP in farming fast enough to overcome the effect of falls in farm output prices due to OECD's market-distorting farm support. With changes in the global organization of science (see above), that might work for the remaining poverty heartlands in Africa and parts of Asia, but stronger pressures against OECD agricultural policy malfeasance would greatly improve the prospects.

Gains to the rural dollar poor from globalization appear to be seriously threatened by failures of intermediation between small/family farms and institutions of exchange that, while long familiar in developed countries, are near newcomers, spreading at unprecedented speed, in many developing ones: supermarkets, horticultural export companies, and public and private grades and standards (Reardon et al. 2001, 2003). As these spread, small family farms—even while retaining their advantages of low-cost labor management in production—may face high unit transaction costs (notably for quality control, for example, of pesticide levels, and delivery to outlets) between the farm and the increasingly concentrated outlets of the wholesaler or processor. Overcoming such barriers is feasible, as shown by recent examples (Reardon et al. 2003; IFAD 2001); by the success of very small Chinese farmers in accessing first horticultural exports, more recently rapidly growing domestic supermarkets (Hu et al. 2004); and by the earlier successful history of intermediation for rubber, sugar, and tea between processing, with scale economies in factory processes, collection and quality control, and smallholders, with advantages of low labor-linked transaction costs in production (Binswanger, Deininger, and Feder 1996).

These examples confirm three facts:

1. In family farming, as in other sectors, the responsiveness of growth to incentives—whether created by scientific progress or by globalization—depends on producers' prospects of responding to new information, and therefore on affordable but substantial provision of, and reasonably equal access to, education (Jamison and Lau 1982; Birdsall et al. 1995).
2. Appropriate farm science increases or "potentiates" gains from globalization: labor-intensive small farms are better placed to raise production in response to freer trade and investment if they are reached by appropriate science-led innovations and find them profitable. Such potentiation requires communication of information, so that new science raises the returns to universities and extension organizations.
3. The poor gain more from all this if they have not-too-unequal access to land, which may require land reform.

In much but not all of Asia, these conditions were met to a significant extent prior to the large acceleration of open trade and foreign direct investment, and to a lesser extent foreign financial flows, that constituted economic globalization. The parts of Asia left behind in the surge of mass poverty

⁴⁹ In 1995, OECD agricultural subsidies to producers were US\$182 billion: 40 percent of production. OECD farm producer prices were 66 percent above border prices. Subsidies reached \$248 billion (per year) in 1999–2001 (Ricupero 2003).

reduction overlap all too well with the countries, and even the regions within countries, that were for some reason denied a Green Revolution, not-too-unequal family farming, or adequate near-universal (that is, rurally extended and gender-blind) primary schooling, or all three. In Sub-Saharan Africa, with a few exceptions, the general failure to use farm science to achieve substantial and sustainable acceleration of family farm growth *before* the thrust to globalization has made it harder for globalization to help much in reducing poverty. The responsiveness of aggregate farm output, and hence employment, to better farm prices or export access, for example, is small if the productivity of labor and land are low and sluggish.

Finally, an almost unexplored issue for farm science is raised by the combination of globalization and the rising real cost of farm water. In formally irrigated areas, farmers will increasingly divert scarce (and desubsidized) farm water from irrigated rice and wheat to cash crops producing much more value per drop (especially compared with rice). Prospects of global markets for such crops will accelerate this. Conversely, where transport costs loom large or there is a preference for foodgrain self-sufficiency, there will be corresponding moves *toward* staples in unirrigated areas. This sets a new agenda for both crop and water science, especially if concentration on small farmers and poverty reduction is a goal.

I am uneasily aware that this paper in effect suggests a “planning” model for agricultural research that is in tune with neither the history of competition-driven research success before 1960 nor the current reliance on markets. However, the implications of poverty-reduction priorities are, as has been shown, complex (regions), not particularly intuitive (tighropes), essentially interdisciplinary (nutrition, water), and very little aligned with a reward structure that encourages competition for the final demand of wealthy consumers or for the intermediate demand of large farmers. Research, unlike farming, does have scale economies. If it is to meet the needs of the poor, support for large-scale public provision is required. However, the concentration of “frontier” knowledge and techniques in the private sector means that this will have to be bought in and motivated by incentive, if the effort to advance the poor is to succeed.

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Discussant Remarks

Nick Vink, Professor in Agricultural Economics, Department of Agricultural Economics, University of Stellenbosch, South Africa

Michael Lipton's paper starts with some reflections on the issue of farm size and efficiency, so I will also start with some observations on the topic.

But first I must remark that Michael has been a bit naughty, because the inferences he draws about Africa regarding the trend to smaller farms are based on a sample of one country only. Since I don't pretend to have any particular expertise in any country other than my own, I will commit the same sin, so Michael and I are partners in crime.

In raising the issue of the inverse relationship, Michael emphasizes that we need to know a lot more about when and where development based on small farms is conducive to mass poverty reduction. However, I do think we need to start wider, and here I'd like to raise four issues:

1. The guiding framework for Africa's development is the New Partnership for Africa's Development (NEPAD), and for agricultural development, it's the Comprehensive Africa Agriculture Development Programme (CAADP). Neither of these defines Africa as Sub-Saharan Africa (with or without South Africa), and I want to urge that we also stop using this artificial construct.
2. This also means that we have to stop romanticizing "small farms" (as an undifferentiated concept) as the only or even the most important mode of agricultural production in Africa. Africa has many different modes of production (I urge people to read John Senders's paper "Searching for a Weapon of Mass Production"), and these modes are changing.
3. Nevertheless, we still need to explain why small farms dominate in many parts of the continent. At this workshop, we have heard about the effects of rich countries protecting their farmers and the lack of domestic markets.

To this, we could also add the legacy of colonial plunder and exploitation and of the peculiar notions of development aid, which in the African context means the net transfer of capital from the continent and the weird notions of help, such as tied aid and structural adjustment and dumping of food supplies (As an historical aside, I note that Galbraith, according to a recent biography, was in favor of both tied aid and dumping US food surpluses as food aid - showing that you can't even trust the liberals.)

4. Would there be so many small farms in Africa in the absence of these first three factors? I want to be a little controversial and refer to the experience in South Africa at the end of the 19th century. In other words, would farms be small if the circumstances were different?

One "experiment" is the South African experience subsequent to the rise of large urban markets after the discovery of diamonds and then gold. Competition among white and black "subsistence" farmers for these markets was fierce, so much so that the colonial government felt compelled to institute measures to suppress competition from black farmers and to support white farmers for almost a century thereafter.

Throughout this process there was strong evidence that both black and white farmers were aiming to farm in the same way—relatively large, labor-hiring, individually farmed family businesses. The lesson is possibly that we should differentiate between agriculture as an engine of growth and the role that different kinds of small farmers can play in this respect.

What type of technical progress helps small farms become and remain efficient? I am in complete agreement with Lipton's analysis of yield-increasing technology. But, of course, Lipton himself observes that the competitive edge of small farmers is not based on unit production costs, but on transaction costs. In this regard the notion is that small farms have a competitive edge in unskilled labor supervision, local knowledge, and food purchase risk. They do not have a competitive advantage in skilled labor, market knowledge, technical knowledge, inputs purchase, finance and capital, land, output markets, traceability/quality assurance, and risk management.

It is true that to provide small farmers with an edge in these latter respects is largely an institutional issue, but the questions are as follows:

- To what extent can technology help?
- What kind of technology?
- What kind of technologizing system?

If the argument is to be consistent, then the emphasis should not be on farming technologies, but on technologies that reduce transactions costs, hence on issues such as:

- a. Information and communication technologies to provide better, more timely market information
- b. The cold chain: for example, how to get sophisticated trucks across bad roads
- c. Payments systems (including loan deductions, etc.) in absence of electricity and fixed line telephones
- d. Land registration technologies (mass registration, etc.)
- e. Not only new seed varieties but also new ways of packaging them and getting them to farmers

Discussant Remarks

Robert Tripp, *Research Fellow, Rural Policy and Governance Group, Overseas Development Institute (ODI), UK*

I appreciate the opportunity to be able to comment on this complex and very carefully argued case for investing in small farms, and particularly for investing in agricultural research.

I am not going to comment on the Chicago question, but will rather focus my attention on some of the technology issues that Michael Lipton raises in his paper, where he makes a very forceful argument for a strategy for supporting technology development.

First, a couple of preliminary observations: I think everyone agrees that technology is not the answer for everything. For instance, the paper describes some less-favored areas that were probably never very productive agriculturally and for whatever reasons have low emigration rates and often poor governance. When you hear those kinds of descriptions, agricultural technology does not appear very high on the list of priorities.

In terms of technology development itself, Lipton could only sketch some of the ideas. However, he made a particular plea for two kinds of technologies.

The first is transgenics. I think we all recognize that biotechnology has opened many doors and will continue to open more doors in the future. But we're not sure what that future holds, and there are a lot of people out there looking for yield-enhancing DNA. We hope they find it. But I think we want to keep our options open and to appreciate biotechnology is one important avenue, without losing sight of other kinds of technology.

The second major element that Lipton brings forward is addressing water shortages. Although I think it's very difficult to argue against the importance of the proposal, these are management-intensive kinds of technologies. The challenge is more complex than developing the seed that might contain yield-enhancing DNA.

This leads to a concern with the delivery of the technology itself. We can develop the technology, but we also have to make sure we're able to deliver it. There are parts of the paper that refer to the necessity for some kinds of additional investments if, indeed, technology is to reach the poor. Much of this has to do with purchased inputs. People need cash for those purchases. Currently, if a farmer wants to plant a hectare of hybrid maize in Kenya, she is going to have to spend the equivalent of approximately 400 kilograms of grain to buy that hybrid seed. We have to figure out whether it is credit or other kinds of programs that allow people access to these types of purchased inputs.

The poor are also at a disadvantage with respect to information. I think we now understand that innovative extension techniques, such as farmer field schools, usually do not reach the poorest people. For instance, poor people who are farmers, but who also work as farm laborers, are much less likely to be able to participate in that kind of information dissemination and, hence, are much less likely to learn about how to efficiently manage the resources they have. The paper mentions the importance of education and of information, which Nick Vink also addressed.

The argument of Lipton's that particularly drew my attention was that to develop the technology that's really needed, there must be a type and a level of research planning that apparently has never been practiced. The paper proposes that this planning must simultaneously hit three targets (which I would suggest are moving targets) while at the same time balancing two tightropes.

We also learned that even though the Green Revolution got a number of things right, it did so serendipitously, for some of the wrong reasons. So reading the paper made me ask, What is it that motivates research and technology development? How can we elicit the kind of technology, and the kind of planning, that's called for?

Lipton suggests we need to get beyond demand-driven research, which is true, but I also think there is a lot more that can be done to make national and international agricultural research more demand-driven. I don't think there's nearly enough attention yet to that, even though the phrase is commonly used. By "demand-driven," I mean going well beyond participatory research, although this is almost always a good thing. In addition, we need much more genuine political pressure from the countryside on agricultural research institutions.

This is an easier thing to say than to accomplish. The few successful examples are mostly related to cash crops. For those who grow staples, it's more difficult. One of the explanations for why farmers who grow staples are rarely a political force is that they have mixed interest and mixed motivations—there are surplus producers and deficit producers who may want to lobby for different things. Unless technology is able to walk the tightropes described in the paper, these rural groups will not have common interests that can be translated into political pressure on research organizations. Steve Haggblade mentioned this morning that 2 percent of the U.S. population (farmers) have a disproportionate voice in politics. I would suggest that it is not even 2 percent. It's a small proportion of that 2 percent who lobby for agricultural policies that favor a relatively small part of the American farming population.

The second thing about demand-driven research is that national agricultural research needs to spend more attention on markets and on responding to markets. There's been a lot of discussion about getting markets right. But once you fix the markets, the research system needs to do a better job and pay attention to markets. One good example is the call for water-management technology. I think that the people who work on innovation theory would tell us is that if you're going to develop that kind of technology, you need research that must be continually in touch with a wide range of stakeholders of users and manufacturers if water management technology development is to move forward.

Nevertheless, there is an argument that says that leaving research priorities to the market is not sufficient. So Lipton has raised the possibility of some kind of public policy interventions or directives. The example he gave is contracting the private sector for particular innovations, but I wonder how you structure that kind of contract. It has to be for technology that is not so broad that it interferes with current commercial strategies. So, for instance, we know that a number of multinationals are already investing very heavily in biotechnology research for drought resistance. On the other hand, the contract has to be for technology that is broad enough and big enough to attract people's attention to make it worthwhile. Finding that balance is going to be a challenge.

Another issue is payment on delivery. But delivery to whom and under what conditions? I think the private technology providers are going to ask if they only have to develop a new yield-enhancing variety or if they also are responsible for making sure it reaches the hands of poor producers. If they are responsible for the latter, given all the problems related to information provision, how will we make the contract sufficiently attractive? It may well be possible to contract for particular examples of blockbuster technology, following the model of public-private partnerships.

But life goes on, and as even as we speak, decisions are being made about technology and somebody is deciding whether to invest in trait A or trait B for a variety, or to invest in one or another way of addressing soil fertility problems.

I'm wondering if it is feasible to screen those kinds of research proposals taking account of our three targets and two tightropes. Certainly we can eliminate some nonstarters, but we are dealing with an exceptionally heterogeneous farming population. And there is a danger of tying people's hands with too many conditions. I think Thom Jayne mentioned that problem yesterday. So I ask how much fine-tuning, how much differentiation, is possible in the research planning process? Do we have to hit three targets simultaneously?

I also know that even with all the goodwill in the world, technology does some unpredictable things. This is probably not the best example, but about five or six years ago, when the adoption curve was still on its way up, economists at USDA looked at the performance of Roundup-Ready soybeans. They found that the technology really didn't increase yield, and it really didn't even seem to do much in terms of cost savings. And yet everybody who was adopting it was very enthusiastic and talked about

how convenient it was. Studies seem to have shown that those early adopters of Roundup Ready soybeans tended to be smaller growers who used the convenience of that technology to help them free up time to earn even more income from their off-farm enterprises rather than from their farms.

So it's difficult to always predict where technologies are going to go. I think there are certainly limits to formal planning. We need planning, but we equally need an emphasis on follow-up and engagement with the changing conditions in the countryside. That's what researchers have to accept.

I think the overall case made in the paper is strong. We do need a more coherent, publicly funded agricultural research strategy. This assumes that national research systems are well-supported, that they are well-connected to national poverty reduction policies, that farmers have a voice and they are better connected to public research systems than they are at present. It assumes that international agricultural research is able to find its place in a rapidly changing environment. Most of all, it assumes that we have competent, consistent, long-term commitments from donors. I think that at this stage, we are a long way away from any of those conditions.

Discussant Remarks

Colin Thirtle, Professor of Agricultural Development Economics, Centre for Environmental Policy, Imperial College London, UK

I will talk about structural transformation, farm size, productivity growth, and poverty reduction.

In poor countries, technical change is largely land-saving because many things being done by the public sector tend to be biological and mechanical. In rich countries, economic growth is almost entirely powered by getting more and more labor out of agriculture. So there is obviously a big switch. The structural transformation lies behind the farm size issue. It goes way back to 1831, when the German economist Frederic List started looking at the sectors and how they fit together. Induced innovation also shows that there is no point saving an input until it becomes scarce. The turning point in the Table is when the *absolute* numbers in agriculture start to fall.

Date at which the Agricultural Labour Force Begins Decline and % in Agriculture								
Country	Date	%	Country	Date	%	Country	Date	%
USSR	1926	86.1	Japan	1947	52.6	Austria	1939	39.0
Rumania	1930	78.7	Spain	1950	48.8	Germany	1907	36.8
Yugoslavia	1948	77.8	Portugal	1950	48.4	Denmark	1930	35.6
Bulgaria	1946	75.3	Italy	1936	48.2	Norway	1931	35.3
South Africa*	1921	69.5	Luxembourg	1967	44.5	USA	1910	31.6
Finland	1940	57.4	Belgium	1866	44.4	Canada	1941	27.2
Poland	1950	57.2	Switzerland	1880	42.4	New Zealand	1936	27.2
Hungary	1949	52.9	France	1921	41.5	Argentina	1947	25.2
Average E.Europe		69.3	Sweden	1920	40.2	Great Britain	1851	21.9
			Czechoslovakia	1921	40.3	Australia	1933	20.5
						Netherlands	1947	19.3
						Average all Others		36.7

Source: Grigg (1982), Table 11, page 109.

* South Africa is not included in the Eastern Europe average.

But the discussion tended to talk about this relative to Britain, where in 1851, just over 20 percent of the population was in agriculture. At that point, manufacturing started growing fast enough that it absorbed all the population growth and pushed people out of agriculture. Michael Lipton might ask how late this happens. Well, for some of these countries, it's incredibly late. Look at the Netherlands: it wasn't until 1947 that the actual numbers in agriculture started to decline since the Second World War.

Why did the now ex-Communist countries, starting with the USSR, do this? Partly because they had some kind of idea that industry was superior and partly because Communist countries were supposed to be based on agricultural and industrial workers. The unfortunate problem was that the USSR was a rural-agricultural economy. So, starting with their first five-year plan, they would turn this around. But how many years would that take? Chairman Mao's great leap forward was not exactly humanitarian, either.

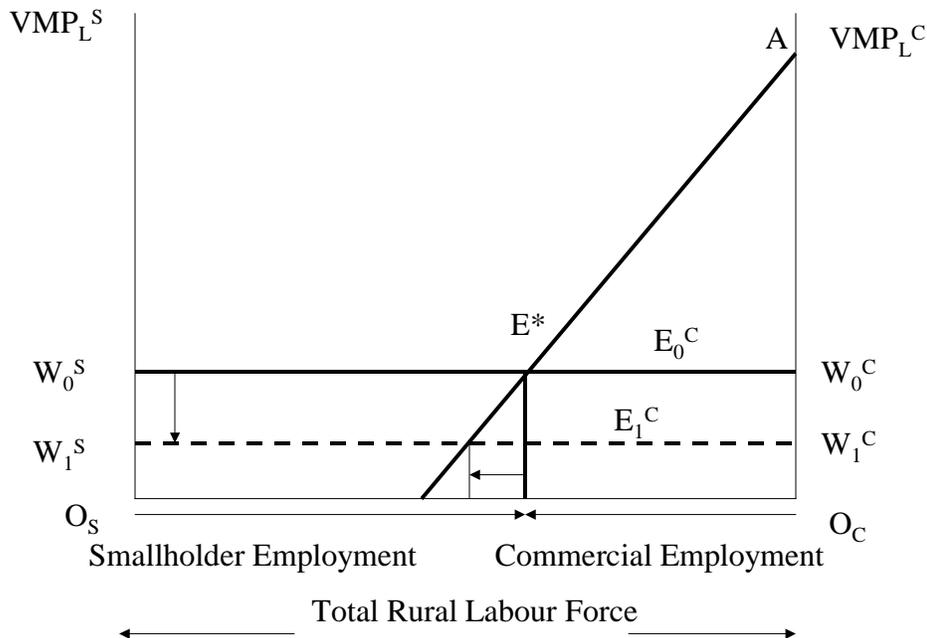
The reason we (Piesse and Thirtle 1997) did this was we've shown that, in fact, in the ex-Communist countries, the agricultural sector had started to grow, instead of shrinking, relative to the other sectors after marketisation. This is not just in terms of the shares (the shares have been known to shrink from way back); the actual numbers fall later. There was something to worry about. One way we worried about it was to try to see what's happening now

In the Figure it is apparent that several developing countries passed the turning point in the 1980s (Brazil, Colombia, Mexico, Korea, Malaysia, Tunisia, Saudi Arabia and Egypt).

At the top there's Egypt and Saudi Arabia. In terms of Egypt, I suppose I'm not surprised that manufacturing is starting to pull people out there. Some of these places you'd obviously expect: Brazil turned the corner quite some while back, which is why when we (Thirtle, Lin and Piesse 2003) were looking at agriculture productivity, Brazil looked like a failure in terms of agricultural research because they actually switched much more to quickly to industrial research. The one that is falling like a rocket is Korea. In Botswana, I don't think it's because the diamond industry is taking people out of agriculture. We'd expect Colombia, Brazil, Korea, Malaysia, Mexico, and I suppose Nicaragua. Nigeria is a bit weak. Swaziland is just bouncing around all over the place, Tunisia, so North Africa is moving.

The next Figure shows that the more you can push the wage down, the more African farmers you can get to work for you at a lower wage, and you get more surplus. It wasn't so much the competition over who was going to feed the mines, it was making the Africans poor enough so they would go down the mines for very low wages.

Figure : Impoverishment of Indigenous Farmers



This was originally used at a session in Cape Town, where we were looking at South African policies. What they've done is impose a minimum wage in the commercial agriculture. The probability of unemployment has to be equal to the real wage elsewhere. So what's quite likely to happen is that there will be these many people here, this much employment, this many unemployed—then you push down the wage there. However this works, it looks like it's going to be damaging. The correct policy, I would say, would be to try to do something about the poor people: What is happening? What makes 40 percent below the poverty line? 40 percent can only speak the tribal language? 40 percent unemployed?

I've provided just a couple of quick hits to make you think about what's happened and how we might manage to go backward from the historical mess whereby the African farmers got made poor quite deliberately. This didn't happen only in South Africa. Before we start thinking about apartheid, remember that they had similar legislation in Kenya, Tanzania, and Uganda. We can blame the Germans for Tanzania, but the rest we have to blame the British.

The point I want to raise is that we have this talk about winners and losers. If we do have a lot of losers, we have this nasty situation (as depicted in the previous pictures) in which they can just be dumped into the subsistence sector and left there to rot.

We have a horrible suspicion that more and more of Africa might go that way. Forty percent is going to be forgotten because no one will care. You can see it coming, and it will be a long, hard fight. And the more countries there are like that, the worse trouble we will be in.

The last point is simply the Genetically Modified (GM) crop technology. Can GM come in on a white charger and save everybody?

I would like to conclude with the role of research and development (R&D). In 1991, the less-developed countries (LDCs) spent \$8 billion on agricultural R&D, and yields have been increasing at 2.4 percent per annum since the 1960s. Thus, the cost of a 1 percent yield increase is \$3.33 billion. In 1990, the gross domestic product (GDP) of the LDCs was about \$2,850 billion; so with a GDP elasticity of 0.56 (Thirtle, Lin, and Piesse 2003), the payoff to this R&D investment was \$16.13 billion. If the lag from expenditures to gains in output is five years, the rate of return is 37 percent; if it is four years, it rises to 50 percent, which is surely an attractive investment.

Poverty reduction is a bonus on top of this figure. In 1998, the number of persons living on less than \$1 per day was 1,200 million, and our best estimate of the poverty elasticity of agricultural research is 0.65. Thus, a 1 percent increase in yields reduces this count by 0.65 percent, which is almost 7.8 million. Viewed in this way, agricultural research may well be a useful and cost-effective instrument for reducing poverty, but it is a pretty blunt instrument, as many have argued. It needs to be sharpened by aiming at the poorest.

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Session 5

Summary of the Open Discussion

The discussion session opened with Michael Lipton responding to discussants' comments and underscoring the need to carefully plan research that aims to improve agricultural productivity to ensure that the final product will not harm the smallholders, hurt the poor, or destroy jobs. These qualifications must be a basic prerequisite for technological innovations, he argued. To make technology beneficial to small farmers, it is critical to facilitate demand-driven research and engage end users from the early stages of research processes. One prominent example of such work is carried out by the Consultative Group on International Agricultural Research (CGIAR) HarvestPlus initiative.

The participants considered the implications of technological innovations for smallholder agriculture and addressed a range of common concerns in this regard. One of them spoke of the need to take into account social and cultural barriers to technology adoption when new solutions are introduced. Another mentioned the lessons from the Green Revolution, when only certain regions responded well to introduction of new technologies. A participant also noted that in the past the rapid periods of technology adoption in Africa in the 1980s were followed by dramatic disadoption in the 1990s and that understanding these trends prior to developing newer technologies may help prevent such problems from happening in the future. Calling for renewed attention to the problems of small farmers in Asia, this participant cited the multitude and dire circumstances of Asia's smallholders and encouraged the audience to apply typologies based on agroclimatic conditions, rather than on regional distinctions, to guide the discussion.

Raising the topic of transgenic research, one of the participants wondered which entity would be willing to pay for these technologies to make them available to smallholders in the developing world, given that in a number of instances such technologies already exist in the private sector. He spoke of the need to overcome the stigma attached to these innovations and was supported by Lipton, who agreed that the donor community has a role to play in providing the necessary funds for transgenic research.

In response to Lipton's focus on labor-using technologies, it was noted that these may not be suitable for countries heavily affected by HIV/AIDS, since some data suggest that in many of those countries, the demographic window of opportunity may not exist as the dependency ratios have reversed. However, Lipton questioned the validity of the data and continued to emphasize labor-using technology as the optimal solution because it would increase the productivity of land faster than would productivity of labor, therefore leaving employment opportunities unharmed.

In his closing remarks, the chair summarized that small farmers have a future but will need a variety of technological and nontechnological interventions to overcome the challenges they face. Thus, demand-driven research, accompanied by provision of water and seeds, and creation of appropriate institutions will be necessary. The chair encouraged the audience to shift from purely academic debate to a more grounded and concrete discussion of actual policy solutions, with the involvement of private sector in the process.

Session 6

Services, Institutions, Intermediation:
New Directions

The Future of Small Farms: New Directions for Services, Institutions and Intermediation

Colin Poulton, *Research Fellow, Centre for Development and Poverty Reduction, Imperial College, UK*

Andrew Dorward, *Reader in Agricultural Development Economics, and Director, Centre for Development and Poverty Reduction, Imperial College, UK*

Jonathan Kydd, *Professor, Agricultural Development Economics and Director, Imperial College London Distance Learning Programme, Imperial College, UK*

1. Introduction

This paper addresses two core questions that are critical to the issues addressed in this workshop:

- What services and institutions are needed for growth in different types of smallholder agricultural activity that can drive pro-poor growth in the poor rural areas where it is needed most at the beginning of the 21st century?
- How can such services and institutions be developed?

We begin by briefly considering the characteristics of smallholder farming and the way that service delivery lies at the heart of the small farm debate. A key issue here are the difficulties that smallholders face in accessing coordinated services for more intensive production and market access, and the way that these differ between staple food crop production, traditional cash crop production, and modern high value product (as opposed to commodity) supply chains. We then review the broad state of affairs in service delivery to smallholders engaged in different types of agricultural production system and issues that arise in the supply of particular services. We argue, however, that the major challenge facing service delivery to smallholders concerns coordination of service development and delivery, and the final section of the paper therefore examines different forms of intermediary institution for achieving such coordination.

Much of the thinking in the paper is exploratory and needs further testing and development. We confess also to an African bias in the paper and would welcome discussion and comments that draw on insights from other regions and perspectives.

2. Small Farm Characteristics and Service Development and Delivery Challenges

Small farms' competitive advantages over large commercial farms lie principally in their low transaction costs in accessing and supervising motivated family labour¹ and in their intensive local knowledge, but their small scale leads to high unit transaction costs in almost all non-labour transactions (in accessing capital, market and technical information, inputs and output markets, and in providing product traceability and quality assurance – see Table 1) (Lipton 1993; Dorward 1999; Kydd, J.G. and Poulton 2000; IFAD 2001; Lipton 2005). These high transaction costs are exacerbated by most small farmers' poverty (with large needs for external sources of capital but limited assets for collateral), dispersion, production and health uncertainty (associated with poverty and lack of access to capital and services) and low levels of education, and by poor physical and informational communication systems and low density of economic activity in the poor rural areas where they predominate. Small farmers thus struggle to deliver reliable and regular supplies of a given crop, particularly when quality is also tightly specified Boselie *et al.*, 2003, and in responding rapidly to changes in buyers' requirements. High transaction costs become particularly problematic where individual transactions require significant

¹ Although we note that a range of free riding problems within family relations can sometimes also pose significant difficulties to small business growth (Long, 1976).

transfers of information about the source or any credence attributes² of commodities being transacted. Such farmers also tend to lack political voice and market power.

The potential for small and large farms to lead pro-poor growth depends upon both these farms' ability to grow and the poverty reducing impacts of such growth. Pro-poor agricultural growth requires high linkage sustainable intensification. High linkages are needed in two ways. First, sustainable intensification requires labour demanding growth which increases both land and labour productivity, generally with a greater increase in land productivity. This needs linkages which allow smallholder farmers to simultaneously and reliably access a range of resources and services: purchased farm inputs, seasonal and medium/long term finance, information and skills (for technology, market and business activities) and output markets. Whilst labour and land are generally assumed to be assets that smallholder households possess, many households regularly hire labour and land either in or out and, therefore, are dependent on the efficiency with which the relevant markets function in their areas. Second, linkages are needed in the sense of growth multipliers: upstream, downstream, and consumption multipliers. Smallholder agriculture is well placed in its poverty reducing multiplier linkages, but faces many difficulties in service and market access linkages: indeed, the juxtaposition of these two different sets of linkage requirements exposes a paradox – the characteristics of smallholder agriculture that give its growth high poverty reduction impacts (its heavy and efficient use of unskilled labour, its dispersion in rural areas with high poverty incidence and imperfect and poorly integrated markets) also pose challenges first for its initial growth and development (as it requires the development of non-labour services and transactions in situations where access to them is difficult and costly).

Table 1. Transaction Cost Advantages of Small and Large Farms

	Small farms	Large farms
Unskilled labour supervision, motivation, etc	X	
Local knowledge	X	
Food purchases & risk (subsistence)	X	
Skilled labour		X
Market knowledge		X
Technical knowledge		X
Inputs purchase		X
Finance & capital		X
Land		X
Output markets		X
Product traceability and quality assurance		X
Risk management		X

This paradox lies at the heart of one strand of the small farm development debate³. Proponents of small farm development as the best strategy for initial mass poverty reduction (e.g. Lipton, 2005) argue that the labour advantages of smallholder farms can continue to give them the competitive edge over larger farms if there exist effective and efficient services to assist them to raise labour and land productivity plus intermediaries to link them to remunerative output market opportunities. Opponents of this view (e.g. Maxwell, 2004) suggest that smallholder agricultural growth will depend on competitive engagement with very demanding produce markets, and that small farms face transaction costs in these markets that are too high to be overcome even with the assistance of intermediaries.

It is helpful in reviewing this debate to identify differences in service delivery problems associated with different types of commodity chain. We focus on three broad types of production system on the basis of both the service delivery problems they face and their potential role in initial mass poverty reduction: staple food commodities, traditional cash crop commodities, and high value

² Credence attributes are attributes of a good or service that cannot easily be determined even after consumption – for example animal welfare standards used in production, organic production or avoidance of pesticide traces – and can only be monitored by observation of production processes or by costly analysis of small samples from a small number of large standard lots.

³ The other strand, concerning relative growth opportunities in staple and high value agriculture, is not the focus of the paper although we do briefly address it at the end of the paper.

(principally horticultural) products⁴. Intensification of all three of these production systems needs greater use of external inputs and services⁵. Higher levels of production require varying amounts of purchased seeds, fertilisers and/or pesticides, together with seasonal finance, purchased equipment, business contacts, and business and technical skills and knowledge. However, a number of problems need to be overcome if the cost effective commercial delivery of these services is to occur. We consider these problems in turn.

Public good problems have been recognised in academic literature for many years (Smith and Thomson 1991). They arise where service providers are unable to capture the returns to investments in providing non-rival and non-excludable services.

Strategic default (Poulton *et al.* 1998) describes deliberate failure to complete a contract (e.g. by failing to deliver produce or payment in some form of credit transaction).

Commitment failure (Dorward *et al.* 2005) is a less widely recognised, but we believe critical, problem that arises from the complementarity between different support services. This can be seen at two levels: their farm production impacts and hence also the profitability to the service suppliers themselves. Thus, before the development of more intensive production systems in an area, markets tend to be thin and producers' demand for one service depends upon their expectation of reasonable (reliable and acceptable cost) access to supply of complementary services. Producers' demand for purchased inputs, for example, thus depends upon their reasonable access to seasonal finance, and vice versa, and demand for these services also depends upon expected reasonable access to output marketing services, demand for which in turn depends upon prior input purchases. Since potential service providers' investments depend upon their expectations of producer demand for their services, they also depend upon their own and producers' expectations of supply of complementary services. This mutual dependence poses a prisoners' dilemma problem for the development of new commodity chains which require investments in new sets of complementary services.

Specification opportunism involves parties to a transaction (having the possibility of) 'cheating' through misinformation in a transaction. Small farmers are often held to be the victims of such opportunism, for example in the case of adulteration of inputs or 'fixing' of scales or measures by traders. However, they can also engage in it, for example by falsely over-declaring quality of produce sold. The requirements of supermarket chains for assured safe food means that produce buyers within such chains have to be seen to take great care to protect themselves against such opportunism.

Small transactions generally exacerbate the problems listed above as transaction costs in addressing these problems tend to have high fixed cost elements per transaction or per transaction partner, so that small transactions incur high transaction costs per unit transacted.).

These problems all directly reduce the incentives for commercial service delivery to small farmers and/or raise the costs of such service delivery. In addition, because of the interdependencies between services, the following problems with service provision by one supplier can indirectly reduce farmer demand for complementary services from another supplier:

Dysfunctional service delivery occurs where farmers do not receive complementary services of the quality needed to achieve the synergies between production inputs. This may arise due to basic failures in service development (for reasons outlined above), to poorly communicated farmer demand, or to ineffective delivery.

Monopolistic opportunism may arise if the provider of one service enjoys a monopolistic position which they exploit to drive a very hard bargain with producers, such that access to the service is scarcely profitable for them. Such a situation is commonly reported where only one produce buyer is operating

⁴ The distinction between commodities and products follows that of Reardon and Timmer 2005.

⁵ While there are low input innovations that can increase land and labour productivity in subsistence activities (Pretty 2000), these alone will rarely be sufficient for strong and sustained agricultural growth. Moreover, even greater integration of livestock and crop production – to increase use of animal traction and manure in crop systems – is likely to require service (e.g. veterinary) support. Finally, agricultural production above subsistence also requires functioning produce markets.

in an area and farmers have no choice but to sell produce at a very low price to recover some of their production costs.

Limited farmer voice is common as a result of farmers being small and dispersed with limited education, low status and limited economic and political power. One important consequence of this is that farmers are unable to put pressure on public sector service providers (especially research and extension systems) to deliver effective services.

We suggest that broadly speaking these problems are common to the three different small farm production systems outlined earlier, although the three systems differ markedly in the commercial incentives for service providers to invest in coordination mechanisms to address these problems.

Table 2 sets out ways in which different types of coordination may contribute to solving the commercial service development and delivery problems discussed above. This distinguishes between three basic types of coordination: *vertical coordination* along a supply chain, *horizontal coordination* between competitors performing the same function in a supply chain, and *complementary coordination* between providers of complementary services in a supply chain. We also identify *focal coordination* as a particular form of coordination that combines vertical and complementary coordination to facilitate a particular set of transactions supporting a critical link in a supply chain (in this case small farm production). Coordination mechanisms may be soft (voluntary) or hard (enforced by some strong central coordinating body), endogenous or exogenous (where an external body encourages and/or enforces common standards of behaviour by contractual parties), and local or extensive (Kydd, J. and Dorward 2004).

Table 2. Coordination Mechanisms for Addressing Service Development and Delivery Problems

Service development & Delivery Problems	Coordination mechanisms
Commitment failure	Complementary & focal arrangements
Monopolistic opportunism	As above, but must be 'hard' enough to deal with incentives to renege on agreements
Specification opportunism	Horizontal arrangements among farmers and among service providers in setting and enforcing standards; vertical, complementary & focal arrangements to establish trust and compliance incentives. Must be hard and extensive enough to deal with incentives to shirk
Strategic default	Horizontal arrangements (among farmers &/or among service providers) in penalising defaulters; complementary & focal arrangements to establish trust, interlocking, & compliance incentives. Must be hard and extensive enough to deal with farmer and service provider incentives to shirk
Dysfunctional service delivery to farmers	Horizontal arrangements among farmers in bulking service demand; complementary coordination among service providers
Small scale transactions	Horizontal arrangements among farmers (economies of scale); complementary coordination among service providers for economies of scope
Public goods	Horizontal arrangements among service providers to create club goods (concentrated market systems only); alternatively, complementary coordination between public providers of services with public good elements and private providers of other services
Limited farmer voice	Horizontal arrangements among farmers

Hard coordination (local or extensive) may be initiated and enforced by the state, depending upon its interests and capabilities. Where this does not occur, establishment of coordinating mechanisms will be voluntary⁶, and there must be incentives for players to invest in these mechanisms. These incentives, however, differ markedly across the three production system types.

For *staple food commodities* (and some cash crop commodities with very low processing requirements) there tend to be large numbers of small buyers for whom limited capital is a major constraint to expansion, along with limited economies of scale and/or opportunities for value addition in

⁶ Hard and extensive horizontal coordination which establishes or involves a monopolistic or monopsonistic cartel or single provider may be able to impose coordination mechanisms on other parties in a supply chain or part of a supply chain, but state authority may be needed for the initial establishment of the cartel or single service provider.

processing. In such situations buyers have no incentives to invest in service delivery to expand supply or to capture an increased market share of supply.

For *cash crop commodities* where buyers or processors need to invest in processing plant and/or downstream relationships, these investments may both act as a barrier to entry to small, under-capitalised traders⁷ and, as specific assets, provide buyers with an incentive to make further investments to increase reliable access to farm products (to improve secure utilisation of and returns to fixed investments in specific assets). Reliable access to farm products may be achieved by vertical integration (investing directly in commercial farm production), by establishing vertical coordination arrangements with large commercial farms, or by investing in service delivery to smallholder producers in exchange for rights to buy the resulting output⁸. Commonly, processing firms provide a full package of services to smallholders with whom they work (focal coordination). Horizontal coordination is also needed between the companies concerned, so that they do not undermine each other's investments in service delivery through side-buying. The incentives to work with small farmers in this way thus tend to be strongest where output markets are more concentrated, as (horizontal) coordination is easier the fewer the number of players involved (Poulton *et al.* 2004).

In the case of *high value products*, investments to increase reliable access to farm products are driven less by the need to achieve high utilisation of expensive processing capacity and more by the need to assure consistent supply of high quality produce as a prerequisite for participation in high value marketing channels. However, the incentives for working with small farmers are undermined where products have high credence attributes, as assuring these involves more or less fixed transaction costs per producer, posing major difficulties for intermediaries serving small farmers. We return to consider this in more detail later in the paper, in section 3.3.

3. Experience with Small Farm Service Development

How does this analysis of commercial incentives for investment in service delivery to smallholder agriculture compare with historical and current experience? This question needs to be examined in the context of different conditions and development policy paradigms that have varied between areas and changed over time.

Dominant agricultural development policy in poor rural economies over the last forty years or so can be (simplistically) divided into two broad phases: state- and then market- led development⁹, though the extent to which countries have switched from one phase to another varies, and most countries that have changed policies have gone through an extended period of adjustment. The two policy phases reflect changes in dominant economic policy paradigms. In the first phase governments and donors emphasised difficulties in relying on large scale private sector investments for service development in smallholder agriculture and therefore promoted state interventions to support markets and service development and delivery. However while agricultural sector policy support was generally positive, it varied between crops, and macro-economic policy, particularly over-valued exchange rates, penalised agriculture, particularly export crops. In the second phase, emphasis switched to reducing state failures in market intervention by relying more on the private sector and on liberalised and more open domestic markets. This second phase has then been the context of an 'agricultural market transformation' with the growing importance of products as opposed to commodities in national and world agriculture and horticulture (Reardon and Timmer 2005). Smallholder farm development and poverty reduction outcomes in these different contexts have been mixed, with experience varying between countries and regions and across crops.

⁷ This will only be the case if players with processing capacity refuse to process on behalf of smaller traders without it and/or if the state refuses to grant trading licences within particular sectors to traders who have not made specified investments in processing capacity.

⁸ In the next section we consider when buyers or processors are most likely to choose to work with small farmers. We observe that this is more likely the more labour intensive the production system and where opportunities for large scale commercial holdings are limited, for example by more egalitarian land tenure systems.

⁹ These two phases of dominant development thinking, about the role and nature of the state and markets in development, of course interact with other progressions – concerning the goals of development, the relative importance of different sectors, the nature of growth needed for development, etc.

Staple Food Commodities

There are strong arguments for sustained intensification of small farm production of staple food commodities providing the greatest potential for initial mass poverty reduction (see for example IFAD 2001; Diao *et al.* 2003; Dorward *et al.* 2004b; Lipton 2005) but achievements in this under different policy regimes have been mixed.

In the state led development phase the large government expenditures and activity in agricultural development led to very little agricultural growth and were little more than a major drain on government budgets in some (mainly African) countries¹⁰ but in other (mainly Asian) countries these state-led systems were home to dramatic and widespread processes of growth in cereal crop production. Dorward, Kydd, and Urey 2004ba, in a review of policies in successful and partially successful Green Revolution areas found that the majority of transformations involved a staged process of state investment in institutional and economic development. Initial (stage 1) interventions involved basic investments to establish more favourable conditions for productive intensive cereal technologies: investments in physical infrastructure (roads and irrigation), in development of improved technologies, and (where necessary) in land tenure systems providing smallholders with reasonably equitable and secure access to land. These investments improved access and potential productivity. Basically profitable new technologies would then be limited to a small number of relatively wealthy farmers with access to seasonal finance and markets. Stage 2 then involved state investment in institutions to 'kick start' markets and service development to enable farmers to access seasonal finance and input and output markets at low cost and low risk. Subsidies worked to reduce transaction risks and costs and promote coordination in service development and delivery through development of hierarchies and of hybrid mechanisms for complementary coordination around small farm production, but they also provided some 'pump priming' to supply chains (Kydd, J. and Dorward 2004). When farmers became used to the new technologies and volumes of credit and input demand and produce supply had built up, thicker markets allowed per unit transaction costs to fall and governments could then (in theory at least) withdraw from its service coordination activities and let the market play an increasingly important role (stage 3).

This model of state intervention was, however, very costly, and it failed if (a) stage 1 physical investments did not succeed in establishing the necessary conditions for intensive cereal based transformations in terms of establishing some minimum level of access and productivity potential (due, for example, to lack of irrigation, insufficiently high yielding technologies, or low population and road densities), or (b) stage 2 institutional investments were ineffective in developing high volume and robust service demand and delivery (due for example to poor political or technocratic management, corruption, or the failure to continue with the system long enough for changes to become embedded).

Failures of very costly state intervention to stimulate agricultural transformation in much of Africa and the need to reduce state intervention where it had been successful contributed to donor pressures for market liberalisation and structural adjustment policies. However subsequent market led development policy has also had very mixed success in promoting food crop production. Liberalisation has generally improved access to output markets in accessible and higher productivity areas and in areas which have already experienced an agricultural transformation, but it has weakened output market access in some remoter areas. More generally, in areas which have not experienced an agricultural transformation the private sector has not been effective in providing farmers with 'upstream services': fertiliser use has been largely stagnant, seasonal finance services have been largely absent, and the extension and research services have continued to rely on generally poor, often cut back, state provision. As a result Sub-Saharan Africa stands out in contrast to Asia in having increased its area under cereals dramatically at the expense of other crops during the 1980s and 90s, for stagnant and very low rates of fertiliser use, and for achieving more than 70% of its increased cereal production from area (as opposed to yield) increases (World Bank 2000; FAO 2002; Dorward *et al.* 2001a). This state of affairs is highly compatible with our earlier discussion of weak incentives for private sector buyers to invest in small farm service delivery investment. However, the weak performance in Africa and other lagging areas (such as parts of South Asia) cannot be attributed solely to these failures: local and global conditions are also more challenging (Dorward *et al.* 2004b; Kelly, V.A. *et al.* 2005).

¹⁰ There were, however, a number of notable and instructional exceptions in Africa.

Traditional Export Cash Crop Commodities

Sustained intensification of small farm production of traditional export cash crop commodities could also make a significant contribution to initial mass poverty reduction where there is broad based participation by small farmers in poor rural areas, production processes are labour intensive and there are potential positive linkages to staple crop production (see for example Govereh and Jayne 2003). Diao *et al.* 2003, however, suggest that the contribution of traditional cash crops to poverty reduction in Africa is likely to be more limited and localised than that of staple food intensification.

Prior to liberalisation many export cash crops suffered from both over-valued exchange rates and inefficient and cash short monopsonistic parastatals which left farmers with low prices and poor services. Shepherd and Farolfi 1999), reviewing a number of early studies of cash crop marketing liberalization in Africa, found that liberalisation had commonly allowed an influx of private capital, management expertise and entrepreneurship with producers often receiving prompt payment and higher prices for produce. However, farmers' access to upstream services (input supply, seasonal finance, extension and research), quality control and prices received by remote farmers had often suffered. Dorward *et al.* 2004a, report similar findings from post liberalisation case studies in Africa, but note that, where coordination mechanisms have been established to deal with the problems of service provision and quality control, liberalisation has commonly led to both production and productivity increases. The most common mechanisms for achieving this were (a) some form of local or national concentration of produce markets providing incentives for investments in service delivery as discussed earlier, (b) horizontal and focal coordination among a small number of large players to enforce interlocking transactions (to deal with default opportunism in seasonal input finance), and (c) involvement of farmer organisations (to generally lower transaction costs and specifically to deal with default opportunism). Market concentration arose as a result of (a) the need for very significant investments in a set of specific assets such as processing plant with large economies of scale, and/or (b) government regulation. Most success stories involved significant investment by international agribusiness or by government in the development of hierarchies and in financing critical services. Market concentration however leads to problems of (a) diminished competitive pressures for efficiency in service delivery and (b) weak bargaining power of farmers, and a major challenge is thus to get the balance right between competition (for efficient service delivery on equitable terms) and non-market coordination (for assured returns to investments in service development and delivery) (Dorward *et al.* 1998; Poulton *et al.* 2004). Success stories have occurred even in the face of depressed world market prices for key commodities, but, at the same time, low world prices do reduce the likely contribution of intensified cash crop production to poverty reduction in Africa, Asia and elsewhere.

High Value Products

Horticultural crops (the dominant type of high value agricultural product) have not in the past generally been subject to regulation and state intervention in the same way as traditional export crops, so it is not appropriate to compare performance under state and market led development approaches. Supply chains serving international and local supermarkets are growing rapidly in developing countries and are particularly important in Latin America, South East Asia and transition economies (see for example Reardon and Timmer 2005), but supermarket growth is slowest in poorer countries and has less reach in poorer, low potential and less accessible areas.

High value supply chains have the potential to include small farmers, especially in the production of labour intensive crops, but increasing importance of standards, and particularly private rather than public standards, poses problems for small farms¹¹. These standards are dynamic and increasingly demanding, may require fundamental changes in production methods and structures with significant capital investments, often involve process monitoring of credence attributes plus traceability requirements, and increase producer risks (of rejection of produce that has failed to meet standards,

¹¹ Similar difficulties are, however, also experienced with (third party) organic standards. Reynolds (2004) notes that, "The work and expense of organic certification creates a major barrier to entry for small-scale ... producers wishing to enter organic exports networks and take advantage of the 30-40% price premium" (p736). She specifically notes that "the extensive farm level records required for certification are burdensome for farmers who are typically only semi-literate" and that "farm inspections are expensive since farmers often have small, dispersed, unmapped holdings" (p736).

and of permanent loss of access to particular high return outlets after significant investments in attempting to access these outlets) (Henson *et al.* 2005). Supermarkets and their wholesale suppliers are also increasingly looking for a limited number of relationships with large scale producers who can produce significant and regular quantities of a range of products and who can respond rapidly to changes in consumer demand both in product attributes and in volumes of different product lines (Reardon and Timmer 2005). The result is that small farms either cannot enter or are being squeezed out of increasingly quality/ safety conscious supply chains and replaced by larger farms (Barham *et al.* 1995; Carter, M. *et al.* 1995; Carter, M. and Barham 1996; Raynolds 2004; Reardon and Timmer 2005).

Nevertheless, there are success stories where formal supply chains enter into contract farming type arrangements and assist small farmers with the seasonal inputs, finance, technical support and quality monitoring systems they need to meet production and quality requirements. These success stories involve some combination of (a) lower credence products, (b) limited opportunities for wholesalers to source from larger farms either because they do not exist or because they have more profitable production alternatives, (c) more labour intensive products, (d) small farmer motivations for participation that extend beyond short term direct profits from participation, (e) product lines with a certain degree of stability in supermarkets' quality and quantity demands, (f) external donor or NGO (financial and/or organisational) support, (g) some form of horizontal farmer coordination (involving relatively independent farmer organisations or contract farming mechanisms), (h) significant investments by produce buyers in facilities and institutional mechanisms (and learning) for farmer monitoring and support and (i) mechanisms which allowed produce buyers and farmers to respond to supermarkets' (limited) changes in quality and quantity demands across and within product lines (Boselie *et al.* 2003; Henson *et al.* 2005; Masakure 2004).

Items (a) to (e) in this list are core techno-economic commodity and contextual characteristics which drive player incentives to develop ways of enabling small farm production (items (f) to (i)).

Towards a Typology of Investment Environments¹²

Figure 1 draws on insights from the previous sections to map out areas of likely commercial interest in investing in service delivery to source supplies from small farms. For simplicity, it focuses on items (a) and (b) in the list above, which we suggest are the two biggest determinants of commercial interest in such investment. However, we recognise that reality is too complicated to be captured entirely within a 2x2 matrix. Below we relate the figure to the ongoing debate regarding the impact of supermarket expansion on small farms, which is itself a major part of the wider debate about the future viability of small farms in an increasingly globalised and competitive world.

Figure 1. Commercial Interest in Sourcing Supplies from Small Farmers

Comparative Advantage of Small Farms	Demand for Output from Small Farms	
	High	Low
High (low importance of credence attributes in supply chain)	Low (Mainly small)	Inequality in Farm Structure
Low (high importance of credence attributes in supply chain)	High (Dualistic)	
	1	3
	2	4

The thinking behind the horizontal axis of the figure is that, given the essentially fixed nature of many transaction costs across transactions of varying sizes, agribusiness is more likely to work with small farms where they have no choice than where they can contract with large suppliers or rely on imports. Agribusiness' preference for large suppliers is reinforced where producers need to make significant and/or regular investments in their supply capacity to satisfy the (evolving) quality and safety requirements of buyers¹³. The better access to capital markets enjoyed by larger farm enterprises means that they are more likely to be able to finance these investments themselves, whereas smallholders are more likely to need assistance from donors, the state or from the produce buyer (Dries *et al.* 2004).

The thinking behind the vertical axis of figure 1 should be clear from our earlier discussion of supermarket (and associated) literature: small farms can deliver elements of cheap and high quality produce (because of their employment of low cost but motivated family labour in labour-intensive tasks, which can outweigh higher costs of capital, poorer access to water etc) but they have real problems with traceability requirements and with quality assurance where this involves credence attributes. Private assurance systems increasingly address this with process monitoring, for which both establishment and operational (inspection and documentation) costs are closely related to the number of producers. This association of costs with the number of producers rather than with the number of transactions (which can be reduced by bulking through horizontal farmer coordination) presents a very big challenge to small farmers and intermediaries serving them.

The vertical axis of figure 1 focuses on the presence of credence attributes. However, we note that other product attributes may also favour large farm over small farm supply. In particular, we have already highlighted products where producers need to make significant and/or regular investments in their supply capacity to satisfy the (evolving) quality and safety requirements of buyers. The vertical axis of figure 1 differentiates commodity chains / groups within countries (whereas the horizontal axis differentiates between countries). However, we note that the nature and speed of evolution of consumer demands is also a function of income levels and growth (i.e. of broader economic development). Just as, on the supply side, a dualistic agrarian structure creates challenges for small farms in a competitive marketing environment, so high levels of income inequality create challenges on the demand side if small farms that have yet to develop beyond semi-subsistence status (i.e. have yet to experience basic intensification or commercialisation) are faced with complex consumer demands (associated with much higher levels of broader economic development).

Within Figure 1, the highest interest in investing in service delivery to smallholder producers occurs in the upper left corner and the lowest interest in the lower right corner. Whilst quality requirements within many traditional export commodity chains are increasing over time, these still mainly concern search and/or experience attributes (the fibre properties of cotton lint being a good example (Larsen 2003)). Thus these systems generally fall within area 1, where small farms still have a good chance of competing through traditional contract farming arrangements, or area 3, where it should be possible for NGO assistance or farmer organisations to reduce some of the transaction cost disadvantages faced by small farms relative to their commercial farm neighbours.

By contrast high value commodity chains generally fall within areas 2 or 4. As already indicated, many of the studies that suggest that small farms are increasingly struggling to compete with larger competitors are focused on these chains. Hence, buyers are opting to contract with large farms rather than to invest in service provision to smallholders. Indeed, we are aware of few studies documenting "viable" models of intermediation to enable small farms to compete in area 4 commodity chains¹⁴.

¹² We are grateful to comments at the workshop from Tom Reardon on the original version of this section of the paper.

¹³ However we also note that the presence of large farms can have a number of important benefits for small farm development (see section 4.5) and in the discussion that follows it is not suggested that a complete absence of large farms is necessarily desirable.

¹⁴ Boselie *et al.* 2003 consider five cases where small farms are being assisted to link into domestic or international supermarket supply chains. Of these, three – including Hortico – might be considered to be area 4 examples. However, in Kenya it is understood that the importance of small producers in such supply chains has declined over time, despite the cited example of Homegrown's outgrower scheme (150 growers). The case of Alice in South Africa – like Hortico in Zimbabwe – needs to be

One such study is that of Henson *et al.* 2005. As this is in many ways an “exception that proves the rule”, it is worthy of additional consideration here. Hortico in Zimbabwe was¹⁵ a supplier of various horticultural products into international supermarket supply chains that sourced principally from commercial farmers, but, starting in the mid-1990s, also developed a contract farming system for smallholder suppliers. This grew steadily in its early years, then expanded more rapidly once the Zimbabwe “fast track” land reform programme began in 2001. Although presented by Henson *et al.*, 2005 as a successful example of intermediation in a high value product chain, there are several important points to note. Firstly, throughout the life of the scheme, Hortico were forced to handle all crop spraying themselves, as the only way of assuring compliance with environmental and safety requirements of buyers. This was costly and costs had to be passed onto growers. As a result, profitability for growers of participation in the scheme was often only marginal. In fact, growers had a range of motivations for contracting with Hortico (as Ghanaian cotton producers did in the study by Poulton 1998b). Secondly, even in the mid-1990s, before the onset of the “fast track” land reform programme, there was perceived political benefit to being seen to be working with smallholders in Zimbabwe. Thus the calculation to work with smallholders was arguably never entirely a simple commercial one. Nevertheless, the fact that the growth of the scheme accelerated after collapse of the commercial farm sector post-2001 (i.e. as Zimbabwe horticulture moved from area 4 towards area 2) is in accordance with Figure 1. Finally, Hortico received support from USAID to get the scheme started. Apparently three other companies also got support, but, despite this, did not succeed in establishing viable commercial contract farming models. This illustrates both the point made by Boselie *et al.*, 2003 that innovative models for linking smallholders to remunerative market opportunities generally require some public funding during the establishment phase and the difficulties of integrating smallholders into area 4 systems.

We are thus pessimistic about the chances of developing widely replicable models for integrating smallholders into area 4 supply chains. Fortunately, in the case of export horticulture at least, these systems are less important for potential poverty reduction strategies in poor countries than either staple food crops or traditional export crops (Diao *et al.*, 2003). The big question thus concerns the extent to which supermarket expansion - and associated proliferation of private grades and standards - in developing countries is forcing even domestic supply chains into the lower part of Figure 1 and especially into area 4.

The Impact of Supermarket Expansion on Small Farms

The fast-growing literature on supermarket expansion around the world highlights the common features of supermarket growth across countries and regions. Where demand conditions are favourable (due to income growth and urbanisation) and restrictions on foreign direct investment have been lifted¹⁶, supermarkets have rapidly expanded to command major shares of the urban food retail market. The implications drawn from this literature often appear to be that the impacts of supermarket expansion will be the same across all countries and regions, differing mainly in their timing, not their nature or spread.

Figure 1 suggests features that will differentiate the impacts of supermarket expansion on small farms across both countries (even assuming equal levels of supermarket growth) and commodity systems. At country level, we suggest that agrarian structure is likely to be a key factor mediating the impact of supermarket expansion on small farms. Thus in Latin America, where dualistic agricultural systems predominate (and where investment in food systems has followed a long period of market repression), supermarket expansion has happened very quickly and there are clear stories of small

seen in the context of political pressure to tackle the overwhelming dominance of large farms in supplying high value marketing channels. The five cases cited by Boselie *et al.* involve a total of 5180 smallholders, of which 4000 work(ed) with Hortico.

¹⁵ We hear that Hortico has recently been forced to close due to unfavourable management of the exchange rate by the Government of Zimbabwe.

¹⁶ Whilst the main emphasis in the literature is on FDI, it is worth noting that domestic planning regulations also influence the pace and extent of supermarket penetration, both in developed economies and in developing (see, for example, Hu *et al.* 2004 on the use of zoning controls in China). Moreover, where domestic regulation is favourable and local enterprises can both develop an appropriate business model and access the necessary finance, as in Chile and Kenya, rapid supermarket development can occur without significant FDI inflows.

farms struggling to maintain their position with the supply chain as supermarkets have spread rapidly (Reardon and Berdegue 2002). Meanwhile, China provides an interesting case of a highly egalitarian farm structure coinciding with strong demand pressure for supermarket growth as urban populations and incomes explode. The result has been innovative institutional arrangements to link small farms to supermarket chains (Hu *et al.* 2004), suggesting that, with appropriate state (or other) intervention, integration of small farms can be achieved even within area 2 supply chains. Similarly, Dries *et al.* 2004 argue that supermarkets and their dedicated supply firms will provide support packages to build the capacity of small and undercapitalised farms in transition countries, “in particular in those where the market is dominated by small/medium farms – at least when retailers want to source commodities locally”.

Indeed, the logic behind Figure 1 also suggests that trade policy may yet have an important role to play, even in the era of supermarket expansion, in mediating the impacts of that expansion on domestic (especially small) farms. If a country allows its processors and retailers to rely heavily on imported suppliers, then they have little incentive (other than cost) to invest in the domestic production base. Small farms, in particular, will suffer from this, as they rarely have the resources to fund investments to raise their capacity to meet supermarket requirements. We note that another feature of the wider environment that perhaps accelerates small farm exclusion from supermarket chains in Latin America is the strong move towards free regional trade during recent years. By contrast, in a country with few large farms and where national policy (or consumer preference) encourages a reasonable degree of local sourcing by supermarkets, supermarkets will be forced to invest more heavily in a small farm supply base if they are to expand. This final point suggests that, under some circumstances, agrarian structure and trade policy may influence more than just the impact of supermarket growth on small farms. For the speed of supermarket expansion – at least beyond the first few stores serving middle-upper income consumers in the main cities – depends on how readily supermarkets can find suppliers that can deliver them the combination of reliable quantities and quality of produce at low transaction costs to outcompete traditional “informal” markets. We return to this point below.

With regard to different commodity groups, it is a well documented phenomenon (e.g. Reardon and Berdegue 2002; Reardon *et al.* 2003; Hu *et al.* 2004; Reardon and Timmer 2005) that supermarket penetration into the market for fresh fruit and vegetables is slower than penetration into the market for non-perishable and processed foods. At the same time, it is accompanied by a high incidence of exclusion of small suppliers from supermarket supply chains. For non-perishable and processed foods, it is similarly well documented that small-scale processing firms are quickly excluded from supply chains (references as above). However, less is documented about the impacts on small farm suppliers of this concentration amongst processing companies. Figure 1 suggests that it should still be possible to devise institutional arrangements to ensure that small farms continue to supply such companies, either directly or indirectly.

Implications for the Future of Small Farms

In Figure 1 we attempted to introduce supply side considerations into debates on supermarket expansion, which can otherwise portray an inevitable and irresistible expansion of supermarkets driven entirely by demand side developments. When considering the future viability of small farms and, in particular, their potential to contribute to global poverty reduction, we must additionally remind ourselves that demand conditions for supermarket growth vary considerably across regions. Whilst consumer food markets are suddenly booming in regions where a long period of market repression has recently ended (for example in Latin America and Eastern Europe) and where there is rapid economic growth (in South East Asia and in Eastern and Central China), demand is much less buoyant in Sub Saharan Africa and in less connected poorer areas in Asia and Latin America where (rural) poverty is concentrated. This is recognised by Reardon and Timmer 2005, who describe much of Africa as being in a (pending) “fourth wave” of supermarket expansion, where “It is unlikely that the lower end of the fourth wave will see supermarket growth for several decades.”.

A related point is that, in the domestic staple food systems that are of greatest importance to global “dollar a day” poverty reduction – in Sub-Saharan Africa and South Asia - the importance of

credence attributes in final products is low, which is good news for small farms. Moreover, in many of these areas, farm structure is, if not exactly egalitarian - in that land holding inequality within smallholder farming areas can be high Jayne *et al.* 2003b - at least not highly dualistic. Thus, the likelihood that small farms will continue to survive within these commodity systems is high. Meanwhile, we have already noted that the prospects for commercial investment in service provision to small farms in traditional export commodity systems remains high, constrained more by trends in world commodity prices than poor prospects for small farm producers.

One final observation related to supermarket growth in Africa is that the “footprint” of supermarkets in Africa (South Africa, Zimbabwe, Kenya, Zambia) is strikingly similar to that of (ex-) settler dualistic agrarian structures. At this stage we can only hypothesise about the reasons for this. One is that, over time, the presence of large farms has supported a certain degree of urbanisation and the associated development of the middle class consumer market¹⁷, i.e. still essentially a demand-side story. Another is that the availability of a large farm supply base has directly facilitated the growth of supermarkets in response to available demand. This hypothesis suggests that the lack of large farms elsewhere may be a constraint on supermarket growth, given the absence of a viable African model for sourcing from smallholders. It also raises the possibility that the speed of expansion in countries where supermarkets are growing could slow once the supply capacity of large farms is reached, if such a model is not developed and limits are imposed on the extent to which supermarkets are allowed to rely on imported produce. We suggest that this point receives insufficient attention in some recent writing on the growth of supermarkets in Africa, e.g. Weatherspoon and Reardon 2003 or Neven and Reardon 2004.

Our discussion of Figure 1 has thus highlighted areas where successful intermediation to integrate smallholder producers into remunerative marketing channels is unlikely (area 4), but argued that, in the production systems that are most important for global “dollar a day” poverty reduction, the future position of small farms is under less threat than reports of rapid supermarket expansion might otherwise suggest.

4. Issues Specific to Different Services

Having developed a broad picture of different problems and opportunities of service development for small farms in different contexts, we now briefly consider issues specific to the development and delivery of different services for small farms: output markets, input markets, financial services, and research and extension. We also briefly discuss access to land and water. Many of the solutions to these problems lie with intermediary organisations which commonly involve *inter alia* different approaches to complementary coordination in service provision. We reserve discussion of these cross cutting issues to section 5.

Output Markets

Questions concerning market prospects are not the focus of this paper, though they are relevant to questions about the initial mass poverty reduction potential of different production systems. Output markets are probably least problematic in terms of the existence of service providers – though this is not to suggest that there are not problems for remote producers or that output markets are generally efficient in providing producers with fair and predictable prices. However, different production systems vary with regard to (a) incentives for buyers to invest in service provision (a critical theme of this paper, which identifies such incentives as high for most low credence cash crops and low for staple food commodities and high credence products), (b) opportunities for and risks from strategic default and monopolistic opportunism and efficiency losses and (c) short term risks affecting returns to farmers’ and other players’ investments in sustained intensification. Most of these issues have been discussed in previous sections of the paper, but one issue that has not been mentioned is the risk that staple crop producers and other investors face from price falls if there is widespread investment in increased staple crop production serving a local market only loosely connected to international

¹⁷ Debates on the roles of agriculture in broader economic development are relevant here (Mellor and Johnson).

markets and with limited storage capacity. Key challenges in output market development concern price stabilisation and possibly support in staple food crop markets (Poulton *et al.* 2005), the establishment of coordination mechanisms for quality improvement in traditional cash crops, and in all systems the establishment of mechanisms that will increase commercial incentives and interest in investing in small farm service development.

Improving farmers' access to market information is another important aspect of improving farmers' access to marketing services. Market information systems' (MIS) potential both to increase market efficiency and to strengthen the bargaining position and/or competitiveness of smaller players (producers against traders, small traders against large) is widely accepted. However, the experience of public investment in MISs has often been disappointing (Shepherd 1997), with information disseminated too slowly or infrequently to be of real use to producers, let alone traders, and governments failing to sustain systems originally established with donor funding. Now, though, a number of innovative approaches are being piloted around Africa. These build on advances in communications technology and liberalisation - especially local FM radio, mobile phones, internet and satellites - to speed up information dissemination and to recognise the need to involve stakeholders in system design, management (e.g. the farmers' union in Mali), and/or financing (e.g. traders in the Foodnet system in East Africa¹⁸).

Commodity exchanges, such as ZIMACE in Zimbabwe (currently closed) and KACE in Kenya, also enhance the efficiency of impersonal, long-distance trade by providing market information and by offering fast and low cost resolution mechanisms for contractual disputes¹⁹. Western Kenyan experience shows that well-organised small farmers, as well as traders, can benefit from commodity exchanges (Woomer and Mukhwana 2004), although it should be noted that, as with many of the other innovative institutional arrangements discussed in this paper, the "cereal banks" that permit smallholders to participate on KACE are still dependent on external (donor) support. We also note that the existence of large-scale players (both sellers and buyers) may be a prerequisite for the establishment of commodity exchanges, to provide a critical mass of trading activity that smaller players and those wishing to make occasional trades can then link into.

Financial Services

The main financial services small farmers need are savings, credit, insurance, and money transmission. These are often closely related to each other, and with input and output marketing services, as regards their being complementary services and facing similar problems (for example low levels of activity with small and dispersed, hence high cost, transactions). Poor money transmission services contribute to this by reducing investment flows from migrant workers to rural areas, inhibiting their potential contribution to raising volumes of savings, input purchases, output sales and incomes.

There are particular challenges in savings and credit service provision in poor rural areas, and in particular in providing credit for seasonal purchases of crop inputs. These latter challenges are related to small, dispersed and high unit cost transaction costs, cash deficit and surplus seasons, covariant risks from adverse weather or prices, absence of insurance markets and collateral. There are further problems in financing input purchases for subsistence crop production, as the financed inputs do not directly lead to sales from which repayments can be made.

In the past, developing country governments addressed these challenges in a number of ways. One set of mechanisms required commercial banks to open branches in rural centers, to operate mobile banks, and/ or to allocate a minimum proportion of their lending to agriculture. Such mechanisms were rarely effective as they were loss making and banks frequently found ways of circumventing them. Another approach was to set up state banks with specific rural or agricultural mandates. These generally operated with a high degree of inefficiency, placed insufficient attention to savings and deposit services, were financially unsustainable and often did not serve the intended

¹⁸ An interesting dimension of Foodnet is that, although it began in Uganda, its information now also caters for users elsewhere in the region.

¹⁹ The existence of such exchanges is also a prior step to the development of more sophisticated trading contracts, such as futures and options.

beneficiaries (Von Pischke, J. D. *et al.* 1983; Braverman and Guasch 1986; Yaron *et al.* 1998). In Africa these activities of state and donor sponsored agricultural credit agencies often led to a climate of 'strategic default' among farmers (Poulton *et al.* 1998), although their common presence in successful Green Revolution areas in Asia should also be noted (Dorward *et al.* 2004b)).

It is, however, difficult to identify many successful alternative financial services providers for poor rural areas in Africa. There has been considerable discussion of the growth of informal financial institutions serving the poor, including savings and credit cooperatives (SACCOs), Caisse Villageois and Village Banks, rotating savings and credit associations (ROSCAs), accumulating savings and credit associations (ASCAs) and micro finance institutions (MFIs). There are examples of SACCOs with wide rural outreach in Francophone Africa. They can be very effective in savings mobilization and can also provide useful links to and entry points for formal banking services in rural areas. These links are however constrained by poor penetration of banking services.

While informal financial institutions can offer a range of savings and deposit services to rural people, they face considerable difficulties in offering seasonal credit services²⁰. Some do offer a range of loan products, but without links to wider financial networks outside rural areas such institutions (and depositors' funds), can be vulnerable to covariant risk. Like private, informal lenders they tend to have both a limited capital base and repayment incentive structures which favour lending for short term and consumption loans and (with the exception of interlocking transactions by agricultural traders) are rarely keen to lend for agriculture and natural resource based enterprises (Jones *et al.* 1999). Links to formal institutions can open up access to funds for lending to members, but rapid expansion of SACCOs as channels of credit from outside funding sources can also weaken incentives for prudent management and protection of savers' deposits (Goldstein and Barro 1999; Outtara *et al.* 1999). The requirements of these informal financial institutions for membership fees, savings and (for lending) collateral also mean that they often reach better off villages and individuals, and exclude poorer communities and individuals. Similarly conventional MFI saving and repayment patterns are not conducive to lending in poor rural areas, or to lending for agriculture (Morduch 2000), and the vast majority of successful MFIs operate either in urban areas, in rural market centers, or in densely populated rural areas with a strong non-agricultural economy and/or agriculture which has already started to 'modernise' (Dorward *et al.* 2001b).

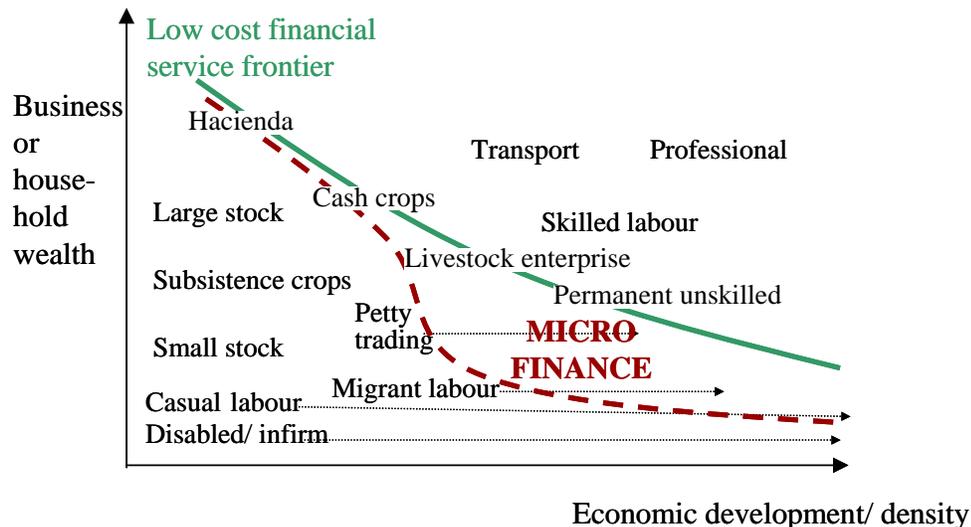
This is illustrated in Figure 2 with a conceptualisation of Von Pischke's 'financial frontier' (Von Pischke, J.D. 1993) to map out a 'low cost financial service frontier'. This shows how market access to financial services is more difficult for small, poor businesses or households (with smaller more costly transactions) and for lower levels of economic development and density (with a lower density of transactions and higher unit transaction costs for service providers). This causes the 'low cost financial service frontier' to slope down from left to right across figure 2: businesses or households located to the right and above this frontier can access such services, but businesses or households to the left and below the frontier cannot and their only access to financial services (if any) is to very high cost services which are generally too costly for use in financing productive investments and are only used in emergencies.

Figure 2 also shows how micro finance systems shift the low cost financial service frontier downwards, by establishing new institutional arrangements that reduce transaction costs and risks for both financial service providers and for poor people accessing these services but, as noted earlier, micro finance systems do not normally reach the very poor, nor extend into poorer rural areas, and are not well suited to seasonal rainfed crop production.

The analysis of Figure 2 can be used to generalise to other types of service delivery first the concept of low cost service delivery frontiers and second the need for new institutional arrangements to push these frontiers down to reach smaller businesses and poorer households in areas with lower densities of economic activity.

²⁰ A further gap in agricultural lending is medium-term loans (2+ seasons) for livestock development or purchase of capital equipment.

Figure 2. Micro Finance Impacts on the Low Cost Financial Service Frontier



One attempt to provide seasonal finance to semi-subsistence food producing households in Africa is described by Poulton *et al.* 2004c. SCOBICS (Sustainable Community-Based Input Credit Scheme) is a pilot agricultural credit scheme, designed ultimately to be compatible with the business model of a typical MFI, that provides seasonal finance for (poor) subsistence producers in Western Kenya. These producers cannot afford purchased inputs for maize production and the consequent low yields mean that they have to allocate most of their land to maize production in order to produce enough maize to meet their subsistence requirements. SCOBICS aims to help them use purchased inputs for maize production, with the higher yields releasing land for cash crop production and some of the cash crop sales financing their maize input purchases. Borrowers are organised into small groups (5-10 persons) and receive loans in kind (in due course the intention is to provide them in the form of input vouchers which can be redeemed at input stockist shops within the area of operation). A graduated loan repayment and loan eligibility system is being developed: successful (95%+) repayment allows groups to expand their borrowing in subsequent years, while significant repayments of less than 95% may still allow subsequent borrowing of smaller amounts. There is also a mixture of group and individual liability for loans. The graduated and mixed liability repayment system learns from systems used by informal lenders and is designed to provide stronger incentives for individual repayment under conditions of covariant harvest risk.

Since input loan repayments are financed primarily by sales of other crops (e.g. beans, soyabeans, groundnuts or horticulture) or non-farm income sources, the project developing SCOBICS has provided technical extension support for integrated crop and soil fertility management as well as attempting to link farmers with local traders to facilitate crop marketing. This scheme is interesting in the way that (a) it integrates cash and food crop production and (b) develops and adapts micro-finance systems to support maize production in a poor, if densely populated, rural area. The system does, however, rely on a bimodal rainfall system to allow this maize/ cash crop integration, and the relatively high population density (as compared with many maize growing areas in Africa) and moderate level of economic activity also allow farmers more alternative means of raising cash (through the labour market) to pay off loans should they suffer from a crop failure. Moreover, there are two key issues in transferring the SCOBICS scheme to an MFI. The first is how to achieve the necessary borrower density in a poor rural area to reach commercially viable scale. As with many of the other innovative institutional arrangements discussed in this paper, the development of the scheme is thus dependent on donor support. It remains an open research question whether or not the scheme will be able to achieve the commercially viable scale that would enable it to operate without an ongoing (albeit small) subsidy to an interested micro-finance provider. The second is how the complementary services that enhance farmers' loan repayment capacity will be provided once SCOBICS is managed by a

mainstream MFI rather than a project. The current state of technical knowledge is summarised in pictorial extension materials that can be utilised by an MFI (though updating these and training contact persons in their use will still need to be sourced from elsewhere) and fertiliser inputs can be readily acquired from local stockists. However, supplies of preferred seed varieties are less readily available locally – reflecting the weakness of seed supply systems in Kenya – and few borrowers yet have established linkages with traders even within local markets, let alone further afield. The sustainability of SCOBICS could thus ultimately depend on the establishment of a decentralised agricultural development planning process (as proposed in section 5.1.3) within the relevant districts of western Kenya.

Meanwhile, Zeller and Sharma, 2000 argue that an important part of financial services should be to enhance the poor's ability to bear risks. Mosley (*pers. comm.*) goes further, arguing that the requirements of the poor are first for insurance, then for saving (without minimum deposit or transaction constraints), and then for borrowing. Provision of insurance services to small farmers is not, however, an area that has enjoyed much success. Insurance of small farms faces many similar problems to lending: high transaction costs and risks as a result of asymmetric information; adverse selection; moral hazard; small insured amounts; and high monitoring costs. In addition both idiosyncratic risks and covariant risks tend to be large, so both the needs for and difficulties with insurance are very high. A number of large scale programmes for smallholder agricultural insurance failed in the 1960s and 70s: large scale insurance schemes should therefore be approached with great caution (Hazell et al. 1986).

Insurance is a particular issue in lending to poorer farmers for productive investment, as loans tend to be large in relation to their income and assets, and an event that prevents them from realising a return from that investment may place them in the disastrous situation of needing to finance the burden of future loan servicing and repayment without any increased assets or income from the loan. Successful lending programmes for cash crop inputs deal with this problem (at least in covariant risk situations, such as bad harvests) in the same way as moneylenders deal with largely idiosyncratic risks (Aleem 1990) by rolling unpaid debts over to the next season where a borrower has a previous record of reliable repayment. Lending for food crop production faces greater difficulties in this area, however, as – with covariant risks - there is likely to be greater political pressure for loan forgiveness in a bad year. This can be disastrous for credit fund liquidity and viability, and, without careful design of loan and insurance systems, promote a culture of strategic default. One way to address this would be to investigate the potential for reinsurance of lending programmes against the effects of covariant risk causing widespread default Poulton, 1998a. Another approach to weather risk is to use agricultural insurance schemes with district rather than farm based assessments of loss and independent yield estimates based on, for example, satellite remote sensing of rainfall and crop growth patterns (see Skees 2002 in Kelly, V et al. 2003 and discussion of BASIX in India in World Bank 2004). However, this approach still faces claim certification problems and tends to reduce the correlation between personal risk and insured losses, and thus reduces the effectiveness of the insurance to the extent that it can become more like a lottery with a high correlation between the chances of suffering a crop loss and 'winning the lottery'.

There are then substantial difficulties in financial service provision to farmers. It is clear, however, that successful models will involve some combination of horizontal coordination among farmers and among service providers, complementary or focal coordination in service provision and external subsidies certainly in the establishment and probably in ongoing operations. We discuss these models under 'intermediaries' in section 5.

Input Supply

It is widely accepted that increased use of purchased inputs (seeds, fertilizers and chemicals) have a critical place, alongside organic soil fertility enhancement practices, in the technical change needed for sustained smallholder agricultural growth. As noted earlier, however, purchased input use is very low

in Africa and has remained largely static over the last 20 years or so²¹, with particularly low usage in smallholder food crop production and growing concerns about declining soil fertility. As would be suggested by earlier discussion of problems in small farm service delivery, constraints to expanded input use exist on both the supply and demand side.

Demand is affected mainly by low profitability and high risks in farmers' use of purchased inputs and by lack of access to seasonal finance. The latter has already been discussed, as have output price levels and stability. Other factors affecting profitability and risks in input use are input prices, quality of inputs, and the technical efficiency with which they are used. Market liberalization often led to an increase in input financing difficulties and a decline in input profitability as a result of input price increases following currency devaluation and removal of input subsidies. These changes were particularly serious for more remote surplus food crop producers, for whom market liberalisation also led to reduced output prices. Rapid and sudden devaluations have also often led to input price uncertainty and exacerbated difficulties and costs in seasonal finance. One benefit from higher fertilizer prices has been increased interest in improving efficiency in using fertiliser through ISFM (integrated soil fertility management) in which limited use of purchased inputs is complemented by organic technologies. This is better for the soil and for household finances and risk than the use of inorganic technologies alone, but better for production than use of organic technologies alone. However, despite significant successes with ISFM (see for example Place *et al.* 2003; Snapp *et al.* 2003), there has been only limited progress in developing ISFM technologies where population density and land pressure are very high.

Efficiency of input use and farmers' demands for inputs can also be encouraged by strengthening of technical knowledge about their use. This requires farmers' simultaneous access to relevant information and affordable inputs (Kelly, V *et al.* 2003) and hence coordination between input delivery and extension services. One means of improving access to affordable inputs is the provision of mini packs, which enable farmers to buy inputs in small quantities – to match their access to finance, to allow testing out of small amounts, or to allow cumulative purchases during a season, depending on the way that the crop develops. This may be an important step on the path to increased input use, as the main impact of small packs may not be to increase production much themselves (as total sales quantities may be quite small) so much as to encourage farmers to move onto larger purchases. Bulk purchases by farmer organisations may also allow reduced access costs for members.

Views about constraints on input supply in liberalised input markets are divided along similar lines to views on constraints to output market development. Jayne *et al.* 2003a document continued government interventions that have clearly depressed incentives for private sector investment in fertiliser supply in Ethiopia and Zambia. However consistent and transparent government policies are a necessary but not sufficient condition for private sector investment in input supply. Jayne *et al.* also report high marketing costs which could be reduced by improving transport infrastructure and management, by reducing uncertainty about government fertiliser interventions, and by cutting taxes and port fees.

These issues need to be considered at all levels in the fertiliser supply chain, from large importers to small retail outlets in rural areas. The latter face considerable risks in stocking fertilisers as farm purchases are made in fairly narrow time windows and are also often very uncertain – depending upon farmers' assessment of input profitability and upon their ability to finance purchases in an uncertain climatic, economic and political environment. This puts stockists in risk of being left with excess inventory which often cannot be disposed of for another year and deteriorates in storage. Input selling is not only more risky but also more demanding of capital and knowledge than, for example, retailing of drinks, soaps and groceries which do not require specialist knowledge and can turn over their capital regularly through the year. Some of these difficulties can be addressed through agro-

²¹ For example Crawford *et al.* 2003 (using FAOStat data) report high variability between countries in growth of total fertiliser use and in intensity of fertiliser use from the 1980s to late 1990s, but find only one country (Ethiopia) with a major increase in fertiliser use on food crops (the result of large scale and intensive government support to intensive smallholder maize production). Kydd, J.G. *et al.* 2004 (using World Bank data) report roughly constant total fertiliser use from the early 1980s to mid 1990s, and a fall in fertiliser use per ha. Rohrbach *et al.* 2003 report a small commercial seed sector in Africa that is narrowly based in terms of its coverage of both countries and crops.

dealer programmes which promote technical and business skills and access to supplier credit for specialist agro-dealers and general rural retailers. Bilateral arrangements between input suppliers and farmer organisations can also help to increase the volume of demand and transaction sizes, while reducing uncertainty - all of which can reduce input suppliers' costs and risks.

Input supply systems face a number of other difficulties associated with quality assurance, promotion, and their impacts on the natural environment. The nature of chemicals and seeds makes it difficult for farmers to gauge their quality at purchase, and they therefore need assurance of the genuine quality of their purchases. For seeds, most countries have varietal registration and certification regulations designed to protect farmers against purchase of poor quality seed. The high cost and delays in getting seed approvals, together with the small size of seed markets in most African countries, presents a serious disincentive on private sector seed supplies, and more rapid progress is needed on harmonising varietal registration and certification across countries (Rohrbach *et al.* 2003). Further challenges exist where varieties are the products of public research system and for open pollinated varieties, as in both cases the incentives and systems for registering varieties and for commercial distribution may be weak. For chemicals there is a risk of sales of adulterated and/or out of date and ineffective stock. This has been a reason for regulations prohibiting repackaging of fertilisers into mini-packs. Stable development of market systems is needed for stockists to build up relationships and reputations with farmers in their localities.

Input stockists face a further 'public good' difficulty in promoting input use, as individual input stockists rarely have funds to do this and they also face a problem from free-riding: if one enterprise invests in promotion of input use, others may enter and share in the benefits of the expanded market. This problem suggests a role for public provision of extension services.

Finally, there are important environmental and health risks associated with use of some chemical inputs and considerable sensitivities around the introduction of GM crops. It is likely that GM crops will become increasingly widely used in commercial agricultural production around the world. Biotechnology has a potential major contribution to make in addressing otherwise intractable issues mainly related to tolerance to disease, drought, salinity etc., and regulation of its use needs to tread a careful line that does not deny smallholder farmers access to technologies that may have the potential to raise their productivity or access to international markets. Safe use of chemicals is an important topic for agricultural extension services.

As with provision of seasonal finance, improved access to inputs requires different elements of complementary and horizontal coordination which are discussed in section 5.

Research and Extension

Delivery systems for extension and research are large topics which we can only touch on, with major and inter-related questions regarding the methods to be used, the topics or issues they should address, and financing and delivery systems and agents. We discuss the last question (financing and delivery systems and agents) but note in passing that it is important that extension should not be considered as involving only communication of technical messages: extension systems and workers need to act as wider information "nodes" and transactions fixers within smallholder communities; facilitating group development and market linkages as well as technical change. This is a challenging agenda and links up with wider arguments in this paper about the need for complementary coordination.

A key question for extension systems is their financing. How can private sector extension providers recover their investments in service development and delivery? This is not such a problem in cash crop systems where crop buyers have strong incentives to provide services to increase and capture smallholder production, as discussed earlier, and in these cases they may find it worthwhile to provide extension messages with strong public good attributes (see Poulton *et al.* 2004 for examples of successes and failures in cotton). Furthermore, in such systems extension costs are reduced by field agents' engagement in multi-tasking across credit, input, extension and produce marketing activities.

Key questions of financing and delivery of extension service remain, however, for food crops and those cash crops where buyers do not have an incentive to supply extension services individually or through some form of horizontal coordination. The willingness of small farmers to pay for private extension depends upon its affordability (its costs and their ability to meet those costs), perceived benefits (which, *ex ante*, are highly uncertain), its public good attributes (the extent to which they can achieve the same benefits without paying for the service). Difficulties also arise as a result of asymmetric information about the benefits of extension services with moral hazard problems where extension providers may seek to sell services and inputs that are not beneficial for their clients. Some of these difficulties can be solved by farmer organizations where there are clearly recognized benefits from technical services but otherwise experience is that privately funded extension services normally only work when combined with input or private service provision at the larger and more commercial end of the small farmer spectrum (see for example Chapman and Tripp 2003). Experiments continue on mechanisms for public financing and private provision to increase competitiveness and voice to farmers to create incentives for service providers to deliver good quality service (see for example World Bank 2004). Competitive supply (with vouchers) is one option that is being tested in Uganda. Another option is to promote greater client voice with decentralized funding and management of extension staff to district administrations, with other stakeholders (such as suppliers of complementary private services, Farmer Organisations and NGOs) involved in participatory planning and monitoring of performance. Bolivia is experimenting with another system which is closer to the applied research/extension interface and involves competitive bidding by potential service providers to deliver applied research and extension services demanded by producer associations. One problem that such systems need to address is the need to provide potential service providers with some degree of assurance that long term capacity investments will yield a return, while at the same time making service provision contestable.

As the Bolivian example suggests, provision of research services involves similar challenges to extension, but these tend to be much larger, owing to long term nature of research, greater uncertainty over its benefits, and larger economies of scale. This means that it presents considerable challenges even in cash crop systems where buyers are effectively providing extension services and may thus require some coordination involvement by the state (see for example Poulton *et al.* 2004).

Land Tenure

There is a large literature on land reform and tenure systems which we do not attempt to address beyond a brief discussion of security of tenure and holding size distribution. Deininger 2004 reports that improved tenure security and transferability can dramatically increase land users' investment incentives and land values, encourage more sustainable resources management, and reduce time and other resources spent securing land rights. These benefits can be particularly important for otherwise "discriminated against" groups (such as women) and where there are benefits to be gained from land transfers between more efficient producers and those who want to exit agriculture. However appropriate mechanisms for improving tenure security and transferability, and the benefits from opportunities to use land as collateral for loans, vary widely according to local circumstances.

Improved transferability may refer to leasing or sale arrangements, and may be constrained by ceilings on operated or owned holdings. Singh 2005 comments on calls for the removal of land ownership ceilings in India by arguing that it is better to look for leasing or cooperative pooling arrangements to consolidate operational holdings while retaining small farmer ownership of land. Our earlier analysis of the interplay of product credence attributes and land holding structure (summarized in figure 1) also suggests that the interests of small farmers may not be best served by land tenure systems that allow dualistic patterns of land ownership with easy purchase of small farmers' land into large commercial operations. However, as noted earlier, under certain conditions the presence of large farms may also generate benefits for small farm development. Large farms located in predominantly small farm economies can provide service centre points and, with outgrower type arrangements, can overcome commitment failure problems and provide economies of scale in service delivery. Large farms can also provide opportunities for workers to learn new technical skills which they can apply on their own small farms and can provide opportunities for adapting technologies to local conditions. Large farms can also add both commercial and political voice to the farming sector Jenkins, 1997,

although there will be issues where small and large farmer interests converge and others where they diverge²². Finally, for high credence products (or for those with capital intensive production and/or the need to respond rapidly to substantial changes in quantity or quality demands within or across product lines) large farms may be the only viable form of domestic production, in which case prevention of large farm production may just close off domestic production options.

These considerations suggest the need for a nuanced approach to land holding and farm structure. It may be appropriate to encourage (or maintain) some large farm development, but this should be in an investment and political climate that allows sufficient security and confidence for investors to commit investments while at the same time putting commercial and political pressure on them to encourage them to support small farm development. Particularly where good quality land is scarce, the “ideal” proportion of land devoted to large farms in low wage economies will always be small.

Where expansion of large farm activities is needed then mechanisms which allow small farmers to retain some benefits from the operational consolidation necessary for such production may well be appropriate and possible. Reardon and Timmer 2005, for example, cite reports of supermarket chains engaging in very significant consolidation of operational land holdings through leasing or contract farming arrangements in China and Turkey.

Water

Better access to water is a critical technical issue for improved small farm productivity in poor rural areas and is covered elsewhere in this workshop. Systems for water management and access are a major and complex challenge which are closely related to the scale and type of water source: we do not attempt to address this topic. We note here, however, that while the technical complementarities between water and seed and fertiliser are widely recognised, there may also be institutional complementarities between irrigation and other service development, delivery and access. This arises in two ways. First, large and small scale irrigation schemes in otherwise rain fed areas commonly become islands of higher input demand and productivity, and of production of higher value crops. This concentration of higher density service demand can attract and provide minimum scale economies to input and output market, financial and extension service providers. Second, strong horizontal coordination mechanisms are commonly required for water management and this can provide a strong base and economies of scope in farmer organisation engagement in coordination of other service development and delivery.

5. Intermediary and Coordination Institutions

Previous sections of the paper have emphasised (a) the importance of complementarity in a number of aspects of service access and delivery (for example links between financial, input and output marketing services for both farmers and service providers); (b) common solutions to different problems in different services (for example horizontal coordination among farmers can address different problems in finance, input, output and extension service delivery); and (c) differences in constraints and opportunities between different types of commodity and product supply chain (we have structured discussion around food crop, traditional export cash crops and high value product chains). In this section of the paper we discuss intermediary institutions that enable coordination between small farms and service providers to gain economies of scope across provision of different services and to address opportunities and challenges specific to different types of commodity and product supply chain.

Before embarking on a discussion of these intermediary institutions, we suggest four principles for their successful development and operation. First, they require a basic set of conditions including

²² Ndambo, 2004 Discusses the example of Zambia National Farmers Union – a farmer organisation dedicated primarily to policy advocacy – that is unusual within ex-settler countries of southern and eastern Africa in that it is the only major farmer organisation in the country and its membership spans both smallholder and commercial farmers. Ndambo’s argument is that the smallholder membership give the organisation political clout, whilst the commercial farmers pay the vast majority of the organisation’s advocacy and outreach costs.

potential for substantial and reliable responses to investment in more intensive production, a reasonable density of economic activity and communications infrastructure, and sufficient margins in the supply chain to provide acceptable returns to different supply chain players. The stringency of these conditions will vary with different types of commodity or product system, and with local context, and their establishment (for example of infrastructure and of productivity potential) may require state investments. Second, different types and combinations of intermediary institution and different processes of institutional development will be needed in different contexts and for different commodity and product supply chains. Third, a common need that will be met in different ways is for 'market facilitator' and 'chain champion' action in the establishment of these intermediaries (Best *et al.* 2005). Finally, although intermediary institutions may involve informal institutions and markets, they will normally facilitate links between small farmers and formal hierarchies with access to formal markets, particularly for obtaining capital, and able to achieve economies of scale in management and business relationships.

We divide our discussion of intermediary institutions between those concerned with service provider coordination and farmer coordination, though as we will see there are strong complementarities between these.

Service Provider Coordination

We further divide our discussion here into forms of interlocking transaction – vertical or focal coordination that forms the basis of intermediation between smallholders and downstream players within supply chains – and decentralised planning – a possible mechanism for complementary coordination of particular relevance to staple food systems.

Contract Farming

Different interlocking arrangements are the primary form of intermediary institutions for smallholder service provision and output market access in many cash crop systems. Drivers (or chain champions) for interlocking arrangements are generally buyers seeking to increase capacity utilisation of specific assets but they may also be driven by state concerns to promote 'critical commodity chains' (see below) or, less commonly and strongly, by input suppliers wishing to expand input sales (for example Poulton 1998a). Arrangements may be bi-partite (with one company providing all interlocked services) or involve relations between multiple service providers coordinating delivery of input, finance, extension and output marketing services to farmers. Bi-partite models achieve greater economies of scope and coordination (provided that they are effectively managed), but may achieve lower economies of scale in access to specialist skills and resources for particular services. Reviews and studies of contract farming (and implicitly interlocking arrangements) suggest that contract farming arrangements do allow small farmers to achieve higher yields, diversify into new crops, and to increase incomes, and that these can deliver wider benefits through, for example, stimulation of demand for hired labour (see for example Stringfellow 1996; Kirsten and Sartorius 2002; Singh 2002; Singh 2005). However, they also note that there are limits to the inclusivity of contract farming schemes (often restricted to the top tier of smallholder producers), often unequal relations between more powerful monopsonistic service providers and farmers, that farmers may bear very high risks, and that terms for farmers may decline over time in the process of 'agribusiness normalisation'. This arises because while the incentives for buyers engaging in these arrangements are high at start up, as the volume of farmers' supply approaches the buying company's processing capacity (or the volume of produce that it can sell onto downstream buyers), so the motivation of the company to keep encouraging production from its contracting farmers declines. Farmers' bargaining positions are also weakened where buyers are in a monopsonistic position, and this also reduces pressures on contracting companies to continually look for efficiency and performance improvements in service delivery. Without such monopsonistic power, however, incentives for company investment and the ability to combat side selling and strategic default by farmers are weakened – an important point that needs wider recognition and a more nuanced approach than general calls for reduced barriers to entry and greater competition in agri-business and market development (World Bank 2004). The challenge is then to find alternative ways of aligning farmers' and companies' incentives and of reducing

transaction costs and risks in service provision. Models here include some form of profit sharing or equity participation for farmers in contracting companies (Knight *et al.* 2003; Singh 2005), competitive coordination among service providers (Poulton *et al.* 2004, Stockbridge *et al.* 1998), involvement of farmer organisations in representing and organising farmers in their relations with contracting companies, increasing exit costs for both farmers and contracting companies (for example through investment in mutually specific assets) (Gow *et al.* 2000; Kirsten and Sartorius 2002) and, more generally, the promotion of greater trust and transparency in farmer-company relations.

We consider some of the issues related to profit sharing or equity participation for farmers when we discuss farmer organisations below. The benefits and dangers of horizontal coordination among service providers are discussed by Dorward *et al.* 1998 with regard to interlocking arrangements, while Poulton *et al.* 2004 extend this to systems for improved grading and quality and for financing research in cotton.

Critical Commodity Chain Support

Although contract farming arrangements are the dominant mechanism for private sector led focal coordination among service providers and farmers, they are generally only found in crops with fairly restricted characteristics (cash crops with high downstream investments, fairly concentrated buyers markets, and relatively low credence attributes)²³. As noted in section 3, the difficulties posed by very high credence attributes may be too challenging to be overcome in smallholder agriculture. However, it is possible to envisage ways in which focal coordination can be achieved in food or cash crops with large numbers of (small) buyers.

State-sponsored support for 'critical commodity chains' is a model proposed by Poulton *et al.* 2004 as a mechanism for promoting smallholder production of commodities which have strategic importance in pro-poor growth policies, and for doing this in a way that simultaneously addresses a number of problems in staple food crop intensification by small farmers: price instability (affecting both producers and poor consumers), commitment failure in service development, and strategic default in credit arrangements. Under this system, each year around planting time a state agency would offer to chosen farmer organisations a limited number of free 'options' under which it would guarantee to buy from option holders a certain volume of grain after harvest at a specified price. A further set of options could be offered for sale by auction. Owners of options could then decide at harvest time whether or not to exercise their option to sell at the set price. These options would provide an incentive for farmer repayment of seasonal credit for input purchases, a focus for complementary coordination of service delivery, a guarantee or collateral substitute in credit arrangements, and, by protecting farmers against price risks, an incentive to invest in more intensive crop production. Poulton *et al.* 2005 discuss this proposal in some detail, with regard to different components (for example surpluses purchased under the system might be used to provide stocks for fair price shops or other channels for subsidising food access for poor consumers), management systems (for example contracting out delivery of different services to private firms or NGOs, local restrictions on output market competition), and strengths and weaknesses of the approach in meeting different policy objectives.

Decentralised Agricultural Development Planning

Decentralised government has been one focus of change in development policy over the last decade, driven by arguments that it can improve effectiveness of government through increased local accountability, greater use of local knowledge, and greater local participation. Without entering into discussion of broader experience of decentralisation in practice, we note here that decentralised government offers opportunities for local level preparation and coordination of local agricultural (or rural) development plans. This can be the responsibility of, for example, district officers and extension staff employed by and accountable to local government administrations but working with NGOs,

²³ Whilst some producers may also be able to access support for food crop production through cash crop-based contract farming schemes (Govere and Jayne 2003), experience suggests that only a minority of producers will be able to do this, even where a viable contract farming scheme for cash crops exists.

private sector organisations, farmer organisations and different local government departments to agree and implement coordinated service delivery. Although there may be echoes here of the integrated rural development projects of the 1970s, the principal problems of these projects (centralised implementation of complex cross ministry programmes of work) should be avoided by (a) the context of decentralised management of government services and (b) reliance on service delivery by different, specialist agencies rather than a single multi-functional project administration. Nevertheless, the model makes very challenging demands on local government officers and may also require major reform of the structure, orientation and culture of Ministries of Agriculture if it is to be successfully implemented in much of Africa Poulton *et al.* 2004b.

Horizontal Farmer Coordination

Despite their mixed record in the past, Farmer Organisations (FOs) are being asked to play an increasing role in supporting commercial small farm development as intermediaries that stand between individual farmers and commercial service providers, often providing some of the coordination functions previously expected from state and parastatal agencies. They are also recognised as having a valuable role to play in policy advocacy on behalf of small farmers and in holding (particularly) state service providers to account for the services that they deliver to smallholders. Indeed the models for service provider coordination described in the previous two sections all either rely on, or are improved by, working with and through effective FOs.

FOs offer both farmers and service providers benefits by bulking transactions and reducing transaction costs and by providing peer monitoring and pressures to combat strategic default and specification opportunism (although there are tipping points beyond which FOs may encourage such behaviour -Stiglitz 1990; Poulton *et al.* 1998). FOs may also give smallholders increased bargaining power with service providers, although the latter may be limited in the face of powerful produce buying companies and input suppliers, and should normally provide organisational capacity building services to farmers as well as technical and managerial services (Bingen *et al.* 2003). Processes of agricultural market transformation and agro-industrialisation that are shifting power from producers to buyers are also reflected in FOs. In staple food and traditional cash crop commodities the primary function of FOs is generally to assist their members in accessing upstream services, and they engage in downstream selling activities to facilitate upstream access. In high value produce chains, however, FOs need to place much more emphasis on facilitating members' access to downstream services (for example, by constructing quality assurance capacities and monitoring systems or coordinating members' production so as to meet buyers' requirements for regular supplies of reliable quality produce²⁴). Thus, all five cases discussed by Boselie *et al.* 2003 feature some form of farmer organisation, as do fair trade initiatives, whilst efforts to reduce the burden of organic certification for small farmers in developing countries relies on functioning producer groups (Raynolds 2004).

Enthusiasm for the potential for FOs to undertake these tasks should not, however, lead to over reliance on them, nor to unrealistic expectations about their ability to directly serve poorer small farmers or be scaled up very rapidly (Chirwa *et al.* forthcoming). Notwithstanding the recent emergence of apparently successful and replicable models, such as that promoted by CLUSA in Mali, Zambia and Mozambique Bingen *et al.* 2003, they face substantial challenges, which are often exacerbated by high external expectations. Major challenges arise as a result of the structure and governance of member organisations, limited organisational capabilities among leaders and members, lack of financial capital, and difficulties in the institutional, economic and agro-ecological environment of small farms in poorer rural areas. As noted elsewhere in the paper, there are also significant difficulties in service provision for staple food crops and for high quality products with very stringent credence and production process monitoring demands – although FOs may also offer alternative models for partnerships between small farmers and companies buying or producing such high quality products. A critical issue in such arrangements is to align incentives for partnership and investment

²⁴ Note, however, that, whilst FOs may be well placed to assist members in satisfying buyers' requirements for regular supplies of produce, collective decision making structures make them less well placed to respond quickly to changes in buyers' requirements. The establishment of wholly or partly owned commercial subsidiaries, as effected by NASFAM in Malawi, may represent a better model for handling this challenge.

both between FO members and between FOs and private sector partners. Alternative (and not mutually exclusive) models here include peer monitoring of process compliance by FO members (Henson *et al.* 2005), farmer shares in private company profits (Singh 2005), the use of Fair Trade premia to finance process monitoring costs (Raynolds 2004), farm worker equity schemes (Knight *et al.* 2003), the adoption of 'new generation cooperative' principles (with, for example, modifications to voting rights and share transfer mechanisms, Knight *et al.* 2003; Singh 2005) and establishment of wholly or partly owned commercial subsidiaries (see Chirwa *et al.* forthcoming for description of innovative structures and partnerships by NASFAM in Malawi).

6. Conclusions

Our starting point for this was the observation that, whilst small farms' competitive advantages over large commercial farms lie principally in their low transaction costs in accessing and supervising motivated family labour and in their intensive local knowledge, their small scale leads to higher unit transaction costs in almost all non-labour transactions. Thus, linkages which allow smallholder farmers to simultaneously and reliably access a range of resources and services - purchased farm inputs, seasonal and medium/long term finance, information and skills (for technology, market and business activities) and output markets – are critical if they are to survive in increasingly competitive agri-food markets. We highlighted the importance of various forms of coordination (vertical, horizontal, complementary and focal) in overcoming a range of problems confronting service delivery to small farms.

We then observed that the incentives for the private sector to invest in service delivery to small farms varies by commodity system. They are perhaps strongest in traditional smallholder export sectors (e.g. cotton, cocoa, coffee) - crops with high downstream investments, fairly concentrated buyers markets and relatively low credence attributes. In higher value horticultural systems, the difficulties of quality assurance and traceability for smallholder produce tend to outweigh the labour cost incentives for intermediaries to invest in working with smallholders. We are particularly pessimistic about the prospects for intermediation to include smallholders in such systems within dualistic agrarian structures (see our discussion of Figure 1). We note that such situations are the source of many of the discouraging stories of smallholders losing their competitive position within supply chains although we also note the positive contributions that the presence of some large farms can make to the development of smallholder service delivery systems and farms.. We do not suggest that one should generalise from these stories to a pessimistic conclusion that small farms have a grim future more generally.

Progress with developing viable models for delivery of individual services to small farms was reviewed in section 4. There is still at best limited progress with the development of replicable models for seasonal finance or insurance provision, whilst in many countries improvements in extension services require a thoroughgoing reform of the ministry of agriculture and its functions. We also noted that many of the innovative models for service provision discussed in this paper have been dependent on public (often donor) support, at least for their initial development phase. Donors are thus encouraged to keep (indeed, expand) funding for experimental institutional arrangements.

Finally, we noted that farmer organizations have a potentially major role to play in both service provision (coordination and/or direct delivery) and advocacy, but – despite the recent emergence of some promising models – their track record is decidedly mixed. Thus, whilst national policies (backed by donors) should support the development of farmer organizations and create spaces for them to contribute to policy making and accountability processes, time and training input is required to build strong organizations that will make a difference for the majority of small farmers. This is a process that is difficult to fast track!

Our discussion can be drawn together by highlighting the need for balanced judgements and actions specific to the different opportunities and challenges posed by particular crops and agro-economic and political conditions. Balance is perhaps most difficult to achieve in four areas. First, the efficiency and equity gains from competition in service provision must be balanced against the investment incentives from restricted competition (in capacity utilisation and security against strategic

default). Second, support to farm organisations needs to walk some difficult tightropes (Chirwa *et al.* forthcoming), most importantly to provide them with essential support but to do this on a scale and in ways that avoid distorting and undermining their long term growth and effectiveness in serving their members. Third, the potential opportunities and threats that large farms pose to small farm service development and delivery in different contexts need to be balanced against each other, and an appropriate balance struck between prioritising public investment towards service delivery to small farms, state encouragement for large farm development and pressure on large farms (where they exist) to support small farm development. Finally, and closely related to this last point, as constraints and opportunities change over time, due to both exogenous influences and the processes of development, so different policies will be needed for different commodities and products at different times, with changing relative support and modalities of support to small and large farm development.

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Services, Institutions, Intermediation: New Directions*

Hardeep Singh, President, Cargill India, India

Let me first establish a context of where farming is in India. What is India's agricultural balance today? There is a popular myth that India has a surplus agricultural economy. We need to come to grips with reality. India is, in fact, significantly deficit. In the past two years, India has been a major deficit-producing country. It has a total deficit of 41 million tons of grain equivalent and a total surplus of 6 million tons (Table 1). This takes into account that this year, India will not have any wheat surpluses. In fact, we'll most likely, and almost certainly, be in deficit before the end of this calendar year.

Table 1: India's Agricultural Scenario

Surpluses	Million Metric tons	Deficits	Million Metric tons	Grain Equivalent Million Metric tons
Wheat	2	Vegetable oil	5	34
Rice	4	Pulses	1.8	7
Total Surplus	6	Total Grain Equivalent		41

Note: Three-year average; in 2005, wheat surplus is expected to disappear

As I establish the context, let me note that there is a misconception that says processing is driving production. There is fundamental overcapacity in processing in the five largest agricultural crops in India—wheat milling, rice milling, oil seed crushing, sugar cane crushing, and cotton ginning. This large-scale capacity redundancy impacts sector attractiveness and trade practices and has a knock-on effect on value-added processing. So, when you get into value-added products and there's overcapacity in the basic processing, it has a deeper impact as you go into further processing. And on margins, that process is not able to capture because of the overcapacity. So that should be enough to establish the context for agriculture in India and on food processing.

The picture is somewhat more attractive for small farms. I'll first show some facts on small farms in India (Table 2). We need to start by establishing that most farming in India is small farming. We need to then recalibrate what we mean by small and moderate farms in India. By small and moderate farms in India, we mean farms under two acres. Large farms are more than 10 acres. That's the level of India's classification. If you look at Table 2, small and marginal farms of less than two acres, which comprise about 36 percent of the total area, have about 41 percent of the irrigated area. So India is veritably well-endowed in terms of irrigation.

Table 2. Farm Size Demographics, India

Description	Size	Average Size (ha)	Total Holdings (%)	Area (%)	Irrigated Area (%)
Marginal farms	<1 ha	0.4	62	17	21
Small farms	1–2 ha	1.42	19	19	20
Semi-medium	2–4 ha	2.73	12	24	24
Medium	4–10 ha	5.84	6	25	24
Large	>10 ha	17.2	1	15	11
All farms		1.41	100	100	100

Source: Ministry of Agriculture, Government of India

* This text is an edited version of Hardeep Singh's transcribed remarks.

Let's then look at fertilizer consumption. Medium and large farms actually consume less fertilizer than do small farms in India. If you look at fertilized area as a share of gross cropped area, that share is 64 percent in marginal farms and 47 percent in large farms (Table 3). Small and marginal farms actually consume more fertilizer per acre than do large farms in India.

Table 3. Facts about Small Farms

	Small and Marginal Farms	Medium and Large Farms
Fertilized area to gross cropped area (%)	64 63	58 47
Fertilizer consumption per hectare of gross cropped area (kg)	72 65	56 46
Fertilizer consumption as proportion of total consumption ^a	21 21	24 10

Note: The total number in this box does not add up to 100%, because 35% is made up by the semi-medium farms, which are not included in this analysis. That means the total number of the bottom four boxes is 76.

So why does this not have a direct impact on productivity? We don't have reliable data on productivity. That is for this sort of forum to address. Is there a way to extract that information? To look at that information? Information on small farm productivity relative to large farm productivity is not in the public domain today. I don't think there is documented information to say that small farm productivity is less than large farm productivity today. We do know, however, that there is a problem of land use efficiency.

And then we have structural issues of why the small farm is becoming smaller. One of the reasons that the small farm is becoming smaller is that farming in India is a way of life. It is not an economic choice in most of India. It's a way of life. There is an integral relationship between the farm and a large part of India. For example, I cannot sell my farm, because if I sold my farm, I would lose social stature in the community to which my father and forefathers belonged. No matter where I go, people will believe that if I sold my land, I will actually have lost it, that I'm not successful, and that I'm actually a failure. So even from where I sit today, I cannot sell land. Now can you imagine how that relates to the person who is on the farm? And there's a lot of nonfarm activity that is farm-related and that the farmer loses when he makes the choice to sell his land. This is why there's very little land transfer. There is division of land, however. A farmer has three sons. It gets divided among three sons. It normally goes to the sons and not to the daughters, even though men and women are equal by law. And then there is the cost of land. Cost of land in India is probably among the highest in the world. So then you would ask, Why does he not cash his land and do something else? Because if he cashes his land, what does he do? He does not have the skill set to manage his finances.

I'll give you an example. We set up a fertilizer factory in a semirural area. We took on about 700 acres of land from small and moderate farmers and gave them compensation two times the value of land. Most of those people are at a loss today because they don't know what to do with the money. They buy motorcycles. They gamble. They drink. Because they have the cash, they don't know what to do with it. They have never been used to managing money, and they don't know how to invest it for the future. When they had the land, they had a couple of animals on it. There was some milk coming out. There were some vegetables coming. It was a way of life. They lost their base. You cannot really give your land out in India with security that it will come back, because there are large areas of India where land-use issues mitigate against effective optimum usage of land.

So what does the small farmer have to contend with? His land, financial capability, market access is all he knows. Those are facts that we know of. But beyond that is the fact that it impacts his negotiating ability and the terms of trade that he's able to establish with his partners—whether it is for imports, whether it is for exports, whether it is how he deals with the environment.

Let's take, for example, a Cargill program in India. You ask a farmer to grow corn, and he has never grown it in his life. It's not a traditional farm area; it's not a traditional crop. He's contaminating those crops with too much pesticide. Then the farmer says, "I grew what you asked me to grow, and I

produced the crop. How can you not take it from me?" All we know is that it's contaminated, so we cannot buy it. What we did in response, in this instance, was to build a school, so now we have an education program among the largest in the country. And we said we would support the village school and upgrade the school and be involved in rural education in this community as long as we are seeing production in this area. We're not presented as a larger social purpose, but, essentially, all these social purposes are enlightened business interest.

Let's talk about independence and voice. Cooperatives have been largely political and politically led. Cooperatives are run more by the government or by the political system. So, is there a case for collaboration between business and small farmers? We need to explore the catalysts. Again, when you come to the farms in India, small farms essentially mean low-marketable surpluses and wider needs for moving from staple to cash crops. It's an economic choice based on the resource capability. Now, let's look at marketing, price recovery, and net farmer prices. The farmer does not understand the dynamics of the market. Why is it that sometimes he needs to market a crop early in the season? What happens with demand and supply? What happens to prices? Is there an ability to price this not by formal prices, commodity exchange, but by selling his crop that he's asking somebody to share with him? The smaller the market, the bigger the risk for single crop, single product.

We have not really discussed some simple issues of financial planning support for the small-scale farmers. We take it for granted that the small farmer makes economic choices. Yes, all farmers make economic choices. But does he understand, have we provided him the tools, and is there a simple way for him to access information where he can make simple economic choices on crops, on agrimarket. We leave the chance to presumption. Although the farmer does make economic choices, does he have the capability? Does he have the information and knowledge for that? The illiteracy compounds all this. Is there an opportunity for us to provide some simple tools for financial planning?

There is a lot of talk on contract farming in India. There's talk that there should be a formal contract, which the farmer should sign with operators. I believe that it will, in fact, negatively affect the trade of the farmers, largely because they are illiterate, they do not understand the contract and the systems that operate. I think preferred supplier and buyer relationships work better than formal contract farming in areas where the literacy and the capability to understand the contract are very low. In some parts of India, if you write a contract, you will have issues in which old bankers write up contracts, not farmers, and the farmers do not understand what they have signed, and you get into endless litigating, licensing, and further interpretation. There's a huge move toward formalizing contract farming, but I think we need to understand what the issues are. I believe there are not significant legislative gaps for serious processes to get into collaboration arrangements but not contracts.

To understand the farm dynamics in India and to understand small farmers, let me take you through the four major avenues of credit availability for farmers in India. For anything that's a capital good, the bankers are the friendly lenders of finance. Most times the small farmer cannot access capital good financing from the bank because of his land sizes, because the cost of the capital good is disproportionate to the size of his holding. In marketable surplus areas where the commission has a lien on products, there is commodity to make a product lien credit from 2 percent to 3 percent a month, which is from 24 percent to 36 percent a year. The rate of interest in the country is about 8 percent, so we're talking of three to four times that as what the farmer is able to access. Today the farmer in India pays a larger rate of interest for a tractor than for a car. So that's where agricultural lending is, indeed, failing. Then there is lending across segments by operators who will lend by giving fertilizers and seeds. Again, politically active farmers have access to that cooperative for funding and for the component of in-kind loans. And, of course, there's the industry, which, to an extent, will fund with an interest to sell. Then there's the fifth kind, which is the moneylenders who lend for nonfarm needs—essentially for marriages and for funerals—and that is the lowest end of lending. It's not really farm credit, but many farmers, particularly smaller farmers, are in the trap of low-end lending, which goes beyond 36 percent per year interest rate.

I have tried to draw a very simplistic chart showing how the farmer draws his funding needs (Figure 1). It's not the same everywhere or for all crops, but this gives you some indicators on what happens. Almost 90 percent of seed sales in India are on cash, so the farmer pays cash. Why? Because he has money left from the last crop. When you get into the midseason fertilizer, midseason pesticides, and midseason needs, it's a popular cash and credit. So who can take the cash earlier?

Then, of course, there's the late-season labor, equipment, harvesting, marketing, transportation, and equipment needs; most of that is from either the input company or, often, the produce buyers, who, by then, have guaranteed access to the produce and are able to provide credit because they know they have the produce in their grasp.

Figure 1: Crop Input Funding, Private

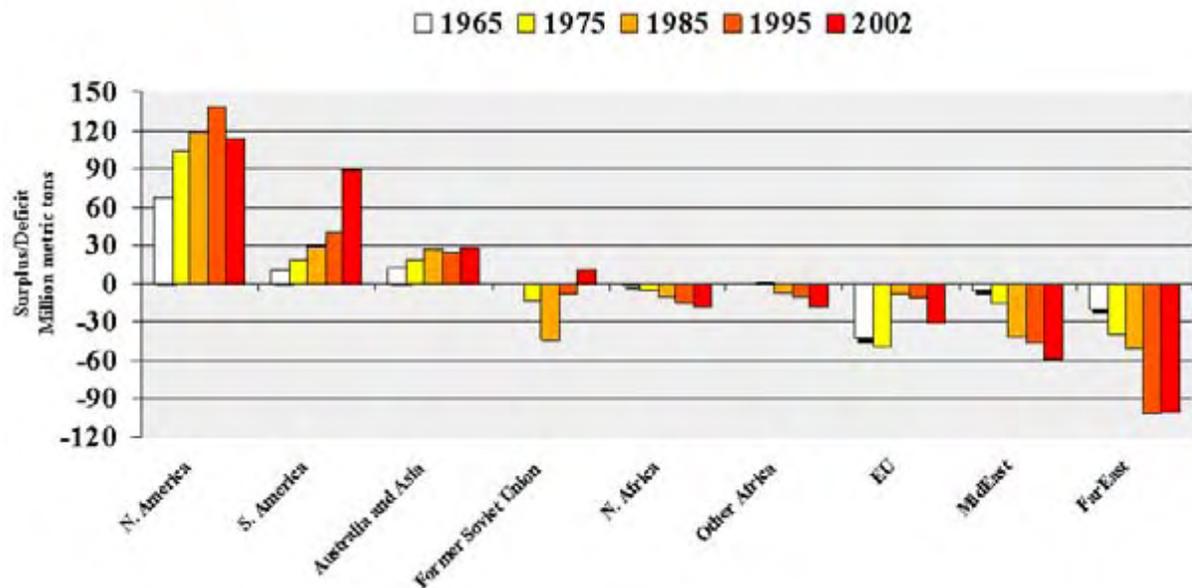
NEED	NO OF DAYS	FUNDING SOURCE
FIELD PREPARATION / LABOUR SEED BASAL FERTILIZERS HERBICIDES	30	LAST CROP
FERT TOP DRESSING PESTICIDES SUPPLEMENTS ETC FUEL / POWER LABOUR	70	LAST CROP INPUT MFRRS INPUT TRADE (DSTRBTRS) RETAILERS
LABOUR EQUIPMENT TRANSPORT	30	INPUT TRADE UNSECURED PRODUCE BUYERS - SECURED EQUIPMENT HIRERS

Most farmers in India have no access to risk management for produce price fluctuations or any kind of risk litigation. Small farmers often produce one crop for one season, which adds to their risk. They go into debt, alcoholism, and substance abuse. Many farmers in central India have committed suicide. Why in central India but not elsewhere in India? Largely because farmers in central India grow cash crops, which is highly volatile. Therefore, when there is a major insect attack or a price issue, the small farmers cannot repay costs, and they do not own the land, and they have to pay back for the lease cost of the land, and they've taken back a significant debt, which is why those farmers are driven to suicide. Traditionally, those farmers are migrant farmers who take land on lease, but they're very good farmers and cash crop farmers. This is one of the purest forms of capitalism in the world. There is no social security, no pension, no health insurance. There's nothing of the sort. So what the farmer earns is all he has.

As I close, let me share with you the state of farming in Asia today. Why it is that addressing India and China is important and why is it not just Sub-Saharan Africa? The largest deficits in the world are now in the Far East, not in Africa (Figure 2). The largest surpluses are growing in South America. The largest deficits are in China, India, and in the Far East, where the population density is increasing and where the nourishment that the consumer is deriving is changing. We are seeing some of it happening in India when it comes to sweeteners, when it comes to oils, when it comes to fruits and

vegetables. But India does not have a proxy. India has very complex and very generic foods. In different parts of India, people eat different foods; they make different choices. Seventy-five percent of India is vegetarian by economic compulsion, not by religion. What happens to meat can change a lot of things. I have seen it happen in China. The large deficit in China was brought not because of a failure of meat production but because of substantially increasing meat production.

Figure 2. Net Interregional Food Flows
(grains, rice, oilseeds, meals, oils, feed equivalent of meat)



So what is the future of the small farmers in India? Will they be able to defend his position? We believe they will be able to defend their position, but we will need to do much more to address supplemental nonfarming activities that the small farmers are eminently equipped to perform. We have not really dealt with animal husbandry. One of the areas that small farmers perform today is animal husbandry, and that is supplemental income for them. We need to accept that in India—because of regional requirements, because of language issues—farmers cannot migrate across regions. We haven't seen that happen. Only a very small population, like the seed farmers, will move. Others have ownership of the land, and they are essentially not so mobile. We need to look at what those farmers can do on the farm.

Discussant Remarks

Johann Kirsten, Professor and Head, Department of Agricultural Economics, Extension and Rural Development, University of Pretoria, South Africa

Many of the points and issues raised during the presentations and discussions of the previous two days were highlighted in this paper, which manages to capture much of the critique and comments on earlier papers while at the same time presenting an important overview of the dilemma facing small farmers and developing farmers. The paper specifically addresses the problems faced by the 25 percent of small farmers who tend to be engaged in market transactions.

Because I share the approach and philosophy of the authors, it is rather difficult to find points of disagreement and critique. Instead, it is worth highlighting the salient points of the written paper:

1. The paper first highlights the characteristics of smallholders, the sources of transaction costs, and specifically the nonlabor transaction costs. The latter is usually increased by poverty.
2. The paper then goes on to discuss the problems that should be overcome to ensure cost-effective delivery of services to small farmers. Specific problems discussed include public good problems, strategic default, commitment failure, opportunism, and enforcement failure.

What the authors neglected to do, however, is to show how all of these problems are related to standard asymmetric information and moral hazard problems. This is an important field of research, which focuses on the issues of trust, factors that contribute to trust, less opportunism, and improved relationship. Many systems, contractual relationships, service delivery, and access to input and output markets fail because of enforcement and trust problems. Specific systems of coordination and institutional development are therefore needed to ensure a future for smallholder production. It is, however, critical to distinguish between “enforcement” problems and “coordination” problems.

3. The conceptual framework was then applied to different conditions and contexts: staple food systems, traditional cash crops, high-value supply chains. It is in the latter context that the issues related to the relationships between supermarkets and small farmers enter the debate again. The authors list the conditions under which success stories in these supply chains could occur. I agree fully that the current debate about the role and future of supermarkets in developing countries has some weakness in that it fails to address the market conditions and the level and nature of consumer demand and how that determines the spread of supermarkets. In addition, the debate does not include a discussion about the conditions under which supermarkets will engage with small farmers. In South Africa, we recently completed a case study on a supermarket in the remote rural area of Venda in northern South Africa, where the supermarket deliberately sourced from small farmers and also assisted them to produce at a commercial level (Vermeulen, 2005). The distance from main fresh produce markets and commercial suppliers probably made this strategy of the supermarket logical, if we accept the principle that most decisions of supermarkets are cost-based.

We all know (again illustrated by work we did in South Africa) how reluctant agribusiness firms are to procure from small farmers. The paper provides a useful framework to understand this reluctance, which could potentially help us design interventions to help agribusiness overcome this reluctance. A current research project by the Food and Agricultural and Natural Resources Policy Analysis Network (FANRPAN) in South Africa, Zambia, and Malawi is specifically focused to determine how incentives by government can be designed to encourage an automatic engagement of agribusiness firms with smallholders.

4. In terms of the broad framework of the paper, the first three sections provided thought-provoking information, while section 4 highlighted much of the standard literature on service delivery to farmers. Nothing was mentioned on the quality of the extension service delivered. Extension workers are often well-trained in extension methodology, but often have no message (read: technical content) or have a poor message to communicate.

5. The section on intermediation was well-articulated and innovative. It is worth mentioning that our work in southern Africa on contract farming has shown that there is already a substantial volume of produce that is bypassing the standard spot markets.
6. The paper finally focuses on the role of farmer organizations in coordination. The problem with this section is typical of most papers on these topics. Farmer organizations are mentioned as critical role players in coordination aspects, but as do many other studies, this paper does not go into the detail about the reason for the failure of many farmer organizations. Nor does it analyze the institutional problems and solutions for well-functioning, efficient farmer organizations. It is important that we do not just treat farmer organizations as an afterthought but that we engage much stronger with the issues related to farmer organizations to ensure that they start playing their rightful role in agricultural development.

References

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Discussant Remarks

Eleni Gabre-Madhin, Program Leader, New Ethiopia Country Strategy Support Program, Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), Ethiopia

I found Poulton, Dorward, and Kydd's paper very interesting to read, but also very broad and dense. This is a very important paper because it enables us to really get at some of the questions that people in this workshop have been touching on for the past few days—namely, how to achieve a market-led agricultural transformation with small-scale production systems.

Basically, the two central questions that the authors are asking are: *What* services and institutions are needed for pro-poor growth and *how* can these services be developed? To summarize, pro-poor growth requires high linkages, through access to services (purchased inputs, finance, information and skills, output markets) and growth multipliers (upstream, downstream, consumption). The paradox of achieving these high linkages for small farmers given their characteristics leads to a key debate highlighted in the paper on smallholder agriculture as best strategy. The essence and proponents of this debate are on one side, Lipton's view that the labor advantages of small farmers are very high provided they have service provision vis-à-vis Maxwell's view that transaction costs are prohibitively high for smallholder service provision.

In addressing *how* to provide services, the authors state that it depends on the type of commodity (staple, cash crop, and high-value); and the need to overcome the following problems:

- Public good nature (non-excludability)
- Strategic default (contract failure)
- Commitment failure (mutual dependence)
- Specification opportunism (weak information)
- Small scale
- Dysfunctional service delivery (due to complementarities)
- Monopolistic opportunism
- Limited farmer voice

The authors propose that coordination is the means to deliver the necessary services and overcome these problems. There are four types of coordination discussed: Vertical coordination (along chain); Horizontal coordination (between competitors); Complementary coordination (between service providers); and Focal (vertical and complementary). The authors discuss several issues related to these: whether they are voluntary versus centrally enforced; endogenous versus exogenous; and local versus extensive.

For staples, the authors are fairly pessimistic about incentives to invest in service delivery. They're much more optimistic about cash crops because of low credence attributes and market concentration. But they are back to being a bit more pessimistic regarding high-value crops because of high credence attributes and fixed transaction costs.

My reaction on the "what" is, first of all, to look at the list of required services and see if it is complete. My first reaction is that risk management is a very important service in some form of insurance that doesn't really come out in a salient way. Another reaction is that there seems a need to unbundle some of these services. First, for inputs, we have to distinguish between factors (such as labor and land) versus external inputs (such as seed, fertilizer, chemicals, etc.). Second, for what they call information/skills, we need to distinguish between market intelligence versus extension services versus quality standards/certification, which are very different services. Finally, on output markets themselves, considered a "service" in this paper, we need to unbundle physical types of services—transport, storage, handling, logistics—versus much more coordination, search, information services.

A third reaction is: what about true public goods, such as roads, water, energy, education, health, research, and telecoms? While these are not covered in the paper, it was mentioned during the presentation that while the authors think they are important, they are going to focus on services. This statement wasn't explicit in the paper. Let's not forget about true public goods!

My reactions to the "how" are the following. The first point is the need to need to distinguish public investment from private service delivery: e.g. roads versus transport services. So, there's the public-private dimension that, again, doesn't come out very well in the paper. Infrastructure is one thing, but providing services on the infrastructure is another thing. So I distinguish between services and basic infrastructure, and I don't see much discussion that highlights that. My second reaction was that the paper didn't really get into the question about growth linkages, although this was brought up in the very beginning as a sort of prerequisite. As I said, there was not much discussion throughout the paper on that.

On the list of the eight service delivery problems, I thought that one might think about distinguishing among types of problems and then bundling or aggregating enforcement-related problems versus coordination-failure problems. Finally, we need to ask whether the proposed coordination mechanisms resolve service delivery problems.

In terms of bundling, it seems that if we were to bundle the eight problems the authors described into enforcement and coordination, then some of the things that they call *strategic* default relate to what I would consider *contract failure* (basically failure of contracts or specification opportunism, which is essentially an information problem). Failure of contracts are, to me, more on the enforcement side, whereas the commitment failure comes under a coordination problem. Similarly, issues of size and dysfunctional delivery are all coordination problems. So, if we split our thinking along this line, this very nicely conforms to, in some sense, the way the New Institutional Economics Literature has also addressed these two sets of problems.

If we now consider the fourth question—whether the proposed coordination mechanisms resolve the delivery problems, I would argue that they do so only partially. The reason is that some of the issues are enforcement and not coordination issues and need to be treated as such.

Focusing on enforcement for a moment, let us consider a strong literature on the key importance of developing low-cost enforcement and contract enforcement mechanisms. As Douglass North has stated, "the inability of societies to develop effective, low-cost enforcement of contracts is the most important source of both historical stagnation and contemporary underdevelopment in the third world" (North 1990, page 11). Thinking further on this, we can consider enforcement within different market types. With the different types of market exchange, from local markets to distant markets, to bazaar or spot markets, to global markets, you have very many different types of enforcement mechanisms to deal with the types of market exchange. So for local exchange, such as local village markets, trust and repeated interaction matter. As we move beyond the local markets of distant exchange, we observe the emergence of networks, norms, and then, as we move into something like the bazaar markets, retail markets, and on down to very large markets, transaction costs increase and that's where you start to need something beyond the actual actors, such as third-party mechanisms—whether they are like the Law Merchant of Medieval Europe described by Weingast, North, and Milgrom (1991) or formal laws and rules.

Thus, it must be recognized that enforcement exists along a continuum. Along this continuum, both private-order and public-order enforcement mechanisms emerge. As the complexity and enforcement costs increase with the evolution of market scope, enforcement increasingly requires third party, formal interventions, even if those are the framework underlying other mechanisms such as trust. Returning to the proposed coordination mechanisms in the paper, these appear to be largely endogenous, or private-order, mechanisms, which only partly address the enforcement problem, which also requires third party mechanisms (arbiters, laws, regulations), which are external or exogenous, public order institutions, in order to enable scaling up. This suggests a greater public sector role than implied in the paper to resolve the broader enforcement problem.

Now, let's focus on coordination. In the Transaction Cost Economics approach, forwarded by Coase (1937) and Williamson (1985), market structure responds to the existence and extent of transaction costs, defined as:

- Cost of screening and selecting a buyer or seller
- Cost of obtaining information on the good or service
- Cost of bargaining and negotiating a contract
- Cost of monitoring and enforcing the contract

The problem of economic organization can thus be conceived as essentially a coordination problem, depending on both information and contracts. So we have spot markets where, basically, you would have atomistic, anonymous transactions; then hybrids of form of relational contracting, such as joint ventures, relational contracting, and supply chains; and then all the way to Williamson's hierarchy, the integrated firm where the whole production process is integrated. This again has to do with a continuum along which transaction costs, defined as asset specificity, frequency of transactions, and specialization, are increasing. So, in my view, coordination is an outcome of underlying transaction costs, and cannot be addressed in isolation of these costs.

To achieve desirable service delivery, changing the extent or nature of underlying transaction costs will achieve a different configuration of market coordination outcomes: this is the policy challenge based on external intervention, rather than creating specific coordination mechanisms as proposed. Second, suitable market coordination emerges in part on its own, or endogenously, depending on market type, that is, type of transactional attributes (local, distant, spot). Finally, I differ from the authors' in that it seems to me that the commodity type is less relevant than the market type and nature and extent of transaction costs. In my view, distinguishing between cash crops vs. staple crops is not meaningful, in light of the fact that staples can be tradable in anonymous domestic or world market.

In sum, I would argue that public investment should be distinguished from service delivery (e.g. markets); that the paper needs to make a clearer distinction between enforcement and coordination/structural problems in service delivery; that the proposed coordination mechanisms only partially resolve service delivery failure and that a greater public role in third party contract enforcement and greater public role in reducing transaction costs (including public goods investments) is needed and that the appropriate intervention is a function of the market type (in terms of both enforcement complexity and transaction costs) rather than of commodity type.

Finally, who wins—Lipton or Maxwell? The answer is neither. The success or potential for small-scale agriculture depends on the ability of societies to reduce those critical underlying transaction costs.

Session 6

Summary of the Open Discussion

In discussing institutional arrangements that would help deliver key services to small farmers, the participants spoke of ways to improve various types of coordination. Among others, piggybacking off cash crops to secure credit access was proposed as a way to improve coordination for food crops.

The importance of institutions to smallholders' survival was questioned by one participant, who felt that achieving substantial increases in small farms' productivity would also result in appropriate institutional arrangements falling into place and many of the coordination problems being phased out, the way it happened in Southeast Asia during the Green Revolution. He highlighted the danger of the "we can't do anything until we do everything" approach adopted by some institutional economists, which prevents proactive steps to address solvable problems. However, one of the speakers, Colin Poulton, argued that coordination will be necessary, at least until a certain threshold of economic activity and market density is reached. Prior to this threshold being reached, only major technological breakthroughs, as opposed to incremental improvements in productivity, may eliminate the need for coordination.

Broadening the concept of institutions, one participant spoke about the prominence of informal institutions for credit provision in Asian countries, although Poulton believed that such informal credit arrangements are less prolific in Africa. In addition, a suggestion was made for the audience to reduce its expectations of the formal public sector institutions and to take into account the self-regulation and coordination from within industries as complementary measures to competition and regulation policy.

The discussion briefly touched upon those factors playing into farmers' decisions, which cannot always be explained in economics through the lens of rational decision-making. For instance, attachment to land has not only economic but also social characteristics. It is cheaper to live on the land, argued Hardeep Singh, while the urban areas provide a heightened sense of poverty. But there is also substantial family pressure that keeps farmers on the land, since they are prevented from potentially squandering their savings and family inheritance that way. One of the participants noted that many small farms show signs of overcapitalization, and this phenomenon was explained in part by farmers' desire to display a particular level of social stature, which in the north of India, for example, is associated with owning a tractor.

In discussing the respective roles of public and private sectors in provision of services to small farmers, some participants advocated an expanded role for the public sectors—if not through directly governing the markets, then at least through providing the necessary funds and subsidies. Others believed that in the current policy environment, agriculture and rural development have become a private sector proposition. One of the later speakers argued that no state—in Africa or elsewhere in the developing world—is likely to significantly increase its investment in agriculture. Instead, there is evidence of the state retreating from agriculture and providing more room for private sector involvement. With regard to the role of public sector, one participant voiced concerns about the ability of governments to absorb substantial increases in aid, while another mentioned the problems of governance. However, a representative from the donor community stated that now is an opportune time to promote the Africa agenda and lobby for aid increases, provided proper mechanisms to channel these funds appropriately can be put into place. The topic of farmers' rights and the role of farmer organizations in strengthening and protecting these rights were also highlighted as key issues that need to be addressed even before a discussion of organizing farmers to access markets. The necessary steps to engage small farmers with the private sector, as Singh emphasized, include reducing transaction costs, especially by exploring solutions through collaboration and consolidation, to make such partnerships possible.

Session 7

Policy and Politics for Smallholder Agriculture

The Politics of and Policies for Smallholder Agriculture

Wilberforce Kisamba-Mugerwa, Director, International Service for National Agricultural Research (ISNAR) Division, International Food Policy Research Institute (IFPRI), Ethiopia

1. Introduction

The majority of the poor and hungry in the least developed countries live in rural areas and essentially depend on agriculture. Among all the regions of the world, Sub-Saharan Africa (SSA) has the highest levels of poverty and hunger and the worst human development outcomes (World Development Indicators 2004). Sub-Saharan Africa is the only region in the world where poverty is on the increase and per capita food production is declining. Alleviating poverty in most agrarian economies, including countries where the contribution of agriculture to gross domestic product (GDP) is relatively low such as South Africa, requires the development of smallholder agriculture. The forces of globalization and economic liberalization are exposing smallholder farmers, small- and medium-scale processors, and agribusinesses to new opportunities as well as new forces of marginalization. The rapid changes in the structure, dynamics and governance of food provision and agriculture places the continuing participation of smallholder farmers at stake.

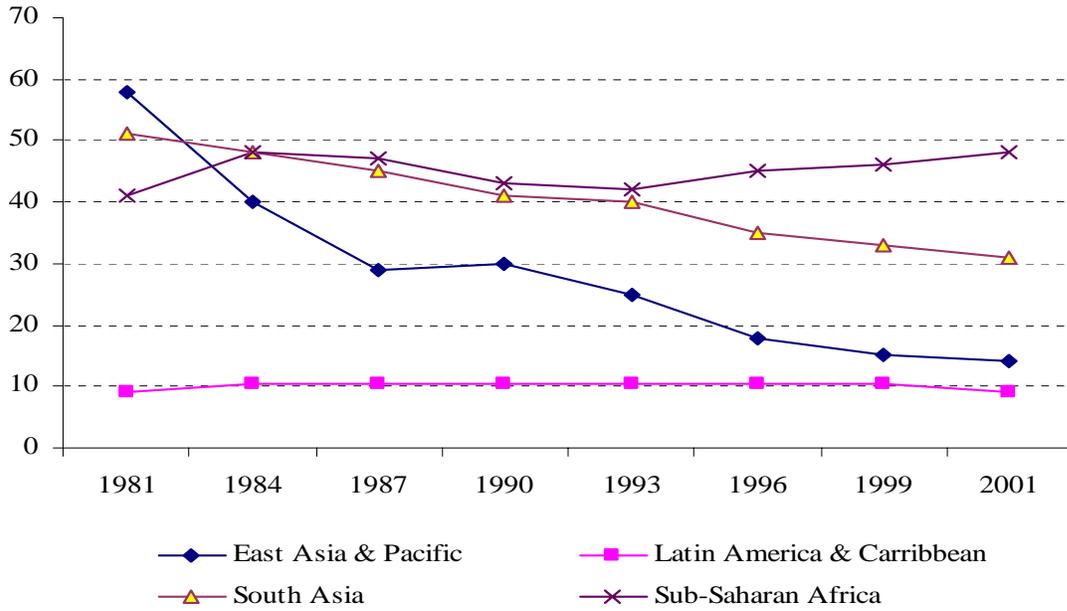
Various studies show a sharp contrast in poverty trends between SSA and other regions of the developing world. Available data from Chen and Ravallion (2004) and World Development Indicators (2004) and Johannesburg Summit (2002) indicate that the proportion of population living in poverty has fallen sharply in East Asia and quite remarkably in South Asia, while the proportion has increased slightly in SSA.

According to the United Nations population growth projections (2004), the global population, which had reached an astonishing 6.1 billion people in 2001 could rise to more than 9 billion in 2050. This population boom will challenge the world's capacity to feed itself and will create further stress on natural resources. The majority of this increase will be in developing countries, where people's livelihoods, particularly the poor's, depend heavily on small-scale farming systems. The Food and Agriculture Organization (FAO) of the United Nations estimates that in Sub-Saharan Africa, 64 percent of the population relies on agriculture as the primary source of income.

The challenges facing smallholder farmers are multifaceted. Tackling these challenges requires a host of responses, including political stability and an environment conducive to farmers working in remote areas. This includes government policies and institutional reforms that facilitate efficient rural service delivery, development of infrastructure, and integrated rural development options. In addition, advisory services and development of markets are also needed. In this respect, government policies and institutions have an important role to play in supporting the success of smallholders.

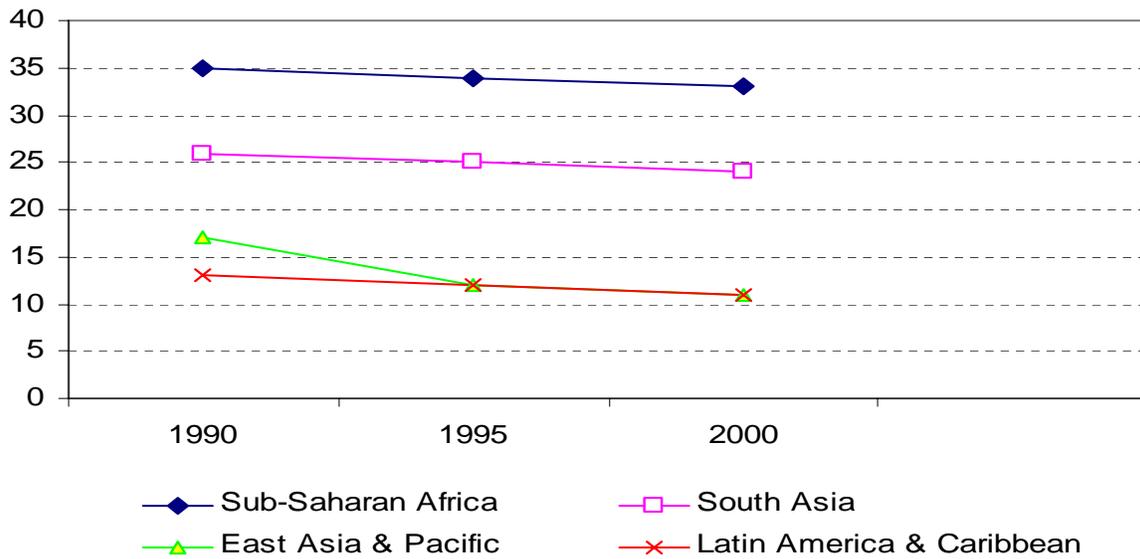
Government policymakers in developing countries would like to assist their people out of the poverty trap so they can enjoy a decent standard of living. Yet, despite efforts by national governments and cooperating partners to alleviate poverty and improve food security, the situation remains the same in many developing countries and is even deteriorating in some areas, particularly in SSA as shown in Figures 1 and 2.

Figure 1. Share of People Living on Less than 1\$ A Day (Percent).



Source: World Development Indicators, 2004; Chen and Ravallion, 2004; Johannesburg Summit 2002.

Figure 2: Hunger Rates in Developing Countries (percent)



Source: FAO, cited in Johannesburg Summit 2002.

This paper draws on experiences from eastern and southern Africa and from other developing countries. By using selected examples, an attempt is made to demonstrate that policies and politics have an effect on smallholder farmer's agricultural growth. Policies need to be harmonized at local, national, regional, and global levels to benefit smallholder farmers. However, good policies alone will not necessarily create the desired impact, unless those policies are supported by political commitment in terms of financial resources and prioritized programs. Their implementation should also be closely monitored and evaluated to take corrective measures when needed to achieve the intended goals. Broad stakeholder participation, sufficient local implementing capacity, and effective coordination and accountability are vital for the successful implementation of policies that promote the smallholder farmer-led agricultural sector.

2. The Enabling Policy Environment for Smallholder Farmers

Politics and Policy

Benjamin's (2000) definition is that "politics [in a democratic society] is the cooperative activity we engage in to achieve the things we cannot achieve individually." Benjamin also claimed that the heart of politics is relationships. *Merriam Webster's Collegiate Dictionary*, in contrast, defines *politics* as "characterized by shrewdness in managing, contriving, or dealing." In Sub-Saharan African countries, we see both aspects reflected in our political systems.

Policy, on the other hand, is defined as a definite course or method of action selected by governments, institutions, groups, or individuals from alternatives and, in the light of given conditions, used to guide and usually determine present and future decisions (ILRI 1995). A policy is a set of coherent decisions with common long-term purposes. Government policies are often supported by special legislation. The terms *policy*, *plan*, *program*, and *project* are progressively more specific in time and place.

In the real world, policies and politics are intertwined. Politics can positively contribute to the successful implementation of policies. Successful smallholder farming, therefore, requires political stability, as well as a conducive policy environment supported by appropriate strategies and programs to match the ever-changing social and economic environment. A conducive policy environment requires, at the bare minimum, the absence of conflict. Unfortunately, the majority of African countries are still experiencing some sort of conflict or political instability, as shown in Table 1. And yet, in Africa, relatively wide stakeholder participation in smallholder farming transformation through the national innovation systems have been put in place, if not fully utilized and achieved (see Table 2).

Table 1. Political Stability on the African Continent

Political Stability Pattern	Countries
Conflict (immediate)	Burundi, Chad, Ivory Coast, Democratic Republic of the Congo, Liberia, Rwanda, Sierra Leone, Somalia, Sudan, Western Sahara
Post-conflict (intermediate)	Algeria, Angola, Benin, Comoros, Equatorial Guinea, Eritrea, Ethiopia, Guinea, Guinea Bissau, Morocco, Mozambique, Nigeria São Tomé and Príncipe, South Africa, Uganda,
Relatively stable or minor conflicts	Botswana, Burkina Faso, Cameroon, Djibouti, Egypt, Gabon, Gambia, Ghana, Kenya, Lesotho, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Namibia, Niger, Senegal, Seychelles, Swaziland, Tanzania, Togo, Tunisia, Zambia

Partial Sources: Addison (2003); SIDA (2003, 2004).

Table 2. The Relative Importance to Stakeholders of the Functions of a National Innovation System

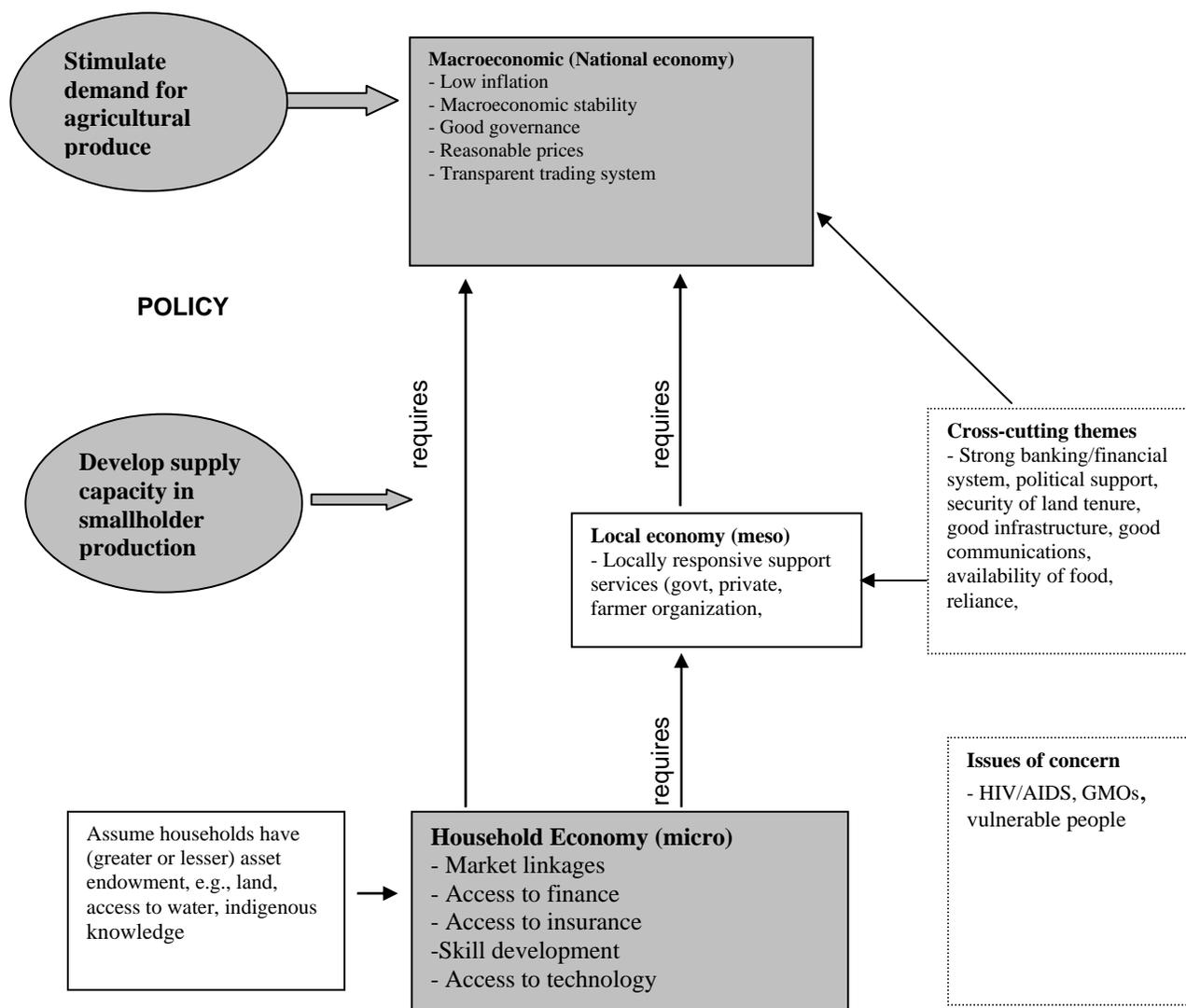
Actors/Stakeholders	Core Functions of Government					
	Policy and Resource Allocation	Regulatory (Policy Level)	Financing (Performance Level)	Performance	Human Resources/Capacity Building	Infrastructure Provision
Government	Key function	Shared function; some standards set by government, some by business	Extensive involvement in supporting both business and tertiary education institutions	Extensive involvement	Some involvement in postgraduate training	Extensive involvement
Business sector	Some advisory function	Shared function; some standards set by government, some by business	Extensive involvement as source and recipient	Key function	Some involvement in postgraduate training; should be important in life-long learning	Some involvement
Tertiary education	Some advisory function	Advisory	Key recipient	Extensive involvement	Key function	Some involvement
Other educational institutions	No involvement	No involvement	Recipient	Limited	Key function	Some involvement
Multipartite bodies	Key function as advisors	Advisory	No involvement	No involvement	No involvement	No involvement
Organized civil society	Key function as advisors	Advisory	No involvement	Limited function	Some involvement	No involvement
Interested outsiders	Some may have an advisory function	Some important at global level	Some have this as a key function	Possible partners	Possible partners	No involvement

Source: Paterson, Adam, and Mullin (2003).

Government Policies and Smallholders

Worldwide, there have been dramatic increases in agricultural production over the past 40 or 50 years. In Asia and Africa, much of this growth has been in smallholder agriculture (Farm Africa 2004). Farm Africa indicated that to alleviate poverty and foster smallholder-led, broad-based economic growth, smallholder farmers need to produce marketable surplus, be market-oriented (in terms of both the quantity and the quality of their products), intensify production systems, move toward greater specialization, and assume certain risks. To move toward commercialization, smallholder farmers require research and knowledge-sharing systems that are responsive to their needs; access to markets, market information, and market intelligence; and effective farmers' organizations, among other needs. The necessary conditions for smallholder agricultural growth are summarized in Figure 3, including the need for a favorable institutional and policy framework so smallholder farmers can take advantage of technological changes (Reardon et al. 1999).

Figure 3. Necessary Conditions for Smallholder Agriculture Growth



Source: Farm Africa, 2004, p.12.

Government Policy for Land Tenure Issues

In Sub-Saharan Africa, where more than a quarter of the population lives on small farms, the average holding is less than 1 hectare (Dunstan 2001). Moreover, plot sizes are continuously declining and becoming more and more fragmented.

In many of these countries, inefficient land tenure policies, difficult contractual institutional arrangements, cultural norms, and rural population growth are preventing small farms from becoming large and efficient. In some countries, division and subdivision of land has approached the point where many farms are now too small to provide subsistence living for households. According to Larsen 2003, by 2050 farmers in Ethiopia would cultivate just 0.04–0.05 hectare, and in Uganda, just 0.01 hectare per person.

According to Deininger (2003), in many developing countries, governments own much of the land that poor people work and occupy. Land also may be held under traditional systems that are not legally recognized, or the legal status of the land may be otherwise unclear. Virtually everywhere, land tenure systems discriminate heavily against farmers, with negative consequences for the entire society.

In all these situations, lack of secure tenure undermines incentives for poor people to invest in their land—for example, for small farmers to build terraces. Deininger (2003) showed that increased tenure security increases the value of land and can greatly increase poor people's wealth, in some cases almost doubling it. Poor people with secure land tenure are more likely to invest in the land. Where credit markets function, formal land rights can make it easier for poor people to borrow money to start a new business (FAO 2002; Mwakubo 2002; Deininger 2003). Many of these benefits are evident in Kenya (Mwakubo 2002).

History has left some countries with a highly unequal distribution of land and other assets. High levels of inequality inhibit growth and make it very difficult for poor people to share in whatever growth occurs. In this case, government intervention to promote security of land tenure and market interventions can be a worthwhile investment in a country's future.

This calls for land reform and land tenure policies in Sub-Saharan Africa that will promote land markets and consolidation of land, as well as promoting the empowerment of people who can effectively adopt technology and investment and utilize arable land for agricultural production. Complementary policies are also required to economically engage those who move out of agriculture. In a number of African countries, land reform policies are determined by politics or are poorly implemented to the detriment of smallholder agriculture. Land reform policies should aim to develop smallholder production systems that are compatible with the sustainable management of natural resources (Zano 1999; Roth and Haase 2000).

Government Policy for Transaction Costs Issues

In many cases, smallholder farmers are edged out of farming due to high transaction costs and fluctuating prices of their produces. Smallholders are usually engaged in primary production of highly perishable produces, with no storage facilities and quick means of transportation. Thus, government intervention to lower transaction costs in terms of transportation and infrastructure, such as roads and storage, may lead to high value addition and fetch better prices for producers.

The transaction costs faced by rural market actors in Africa are much higher than in other parts of the developing world (Thorbecke 1992 cited in Germano, Mwabu, and Thorbecke 2001). The marketing chain is very long and consists of many distinct exchange configurations from the farmers to the consumers. Each of these distinct exchange configurations deals with its own item at different stages of processing and in different locations and involves different actors and environments. Each exchange configuration can be thought of as a node in a marketing chain. The more such nodes along the marketing chain, the higher the overall transaction.

According to Pingali, Meijer, and Khwaja (2005), there is compelling evidence to suggest that increased transaction costs deter entry of small farmers into the market. Thus, interventions aimed at reducing transaction costs could encourage increased farmer participation in competitive markets. Koné and Thorbecke (1996, 303 cited in Germano, Mwabu, and Thorbecke 2001, 31) in a detailed study of sectoral investment priorities in Zaire, found that owing to chronic transport and marketing problems, about 40 percent of total production is consumed by the farmers themselves, while urban markets are increasingly supplied by imports. "The poorer the infrastructure, the less competitive the marketing systems, the less information is available, and the more risky the transactions, the greater the size of this band" . As discussion with the chief executive of Uganda Grain Traders Limited indicated, transporting agricultural produce by road and railway from Uganda to Zimbabwe and Malawi makes the Ugandan farmers out-competed by produce transported by sea from other parts of the world (e.g., Latin America and Asia) (Personal communication with chief executive of Uganda Grain Traders Ltd. 2005).

Clearly, a reduction in the number of nodes along a marketing chain and a consolidation of trading activities would normally lower transaction costs. The extreme case is approximated by the American Supermarket Model, where all functions from production to consumption are vertically integrated into one giant corporation to minimize transaction costs (Germano and Thorbecke 2001).

Government Policy for Collective Action by Smallholder Farmers

Although introductory economic textbooks preach individualism, the safety and prosperity of smallholder farmers depend on collective actions to mitigate against the challenges experienced in farming industries.

Collective action by farmers' organizations becomes efficient and effective when they build on experiences, organize without political interference, and have clearly defined objectives to address self-felt needs. Unlike state parastatals that have become widely discredited because of their poor performance and inefficiency, smallholders' organizations should be organized in such a way that they are voluntary, economically viable, self-sustaining, self-governed, transparent, responsive, and accountable to their members. Thus, policy support without political interference is needed to achieve these goals (World Bank 1995; International Conference on Agriculture and Development 2005).¹

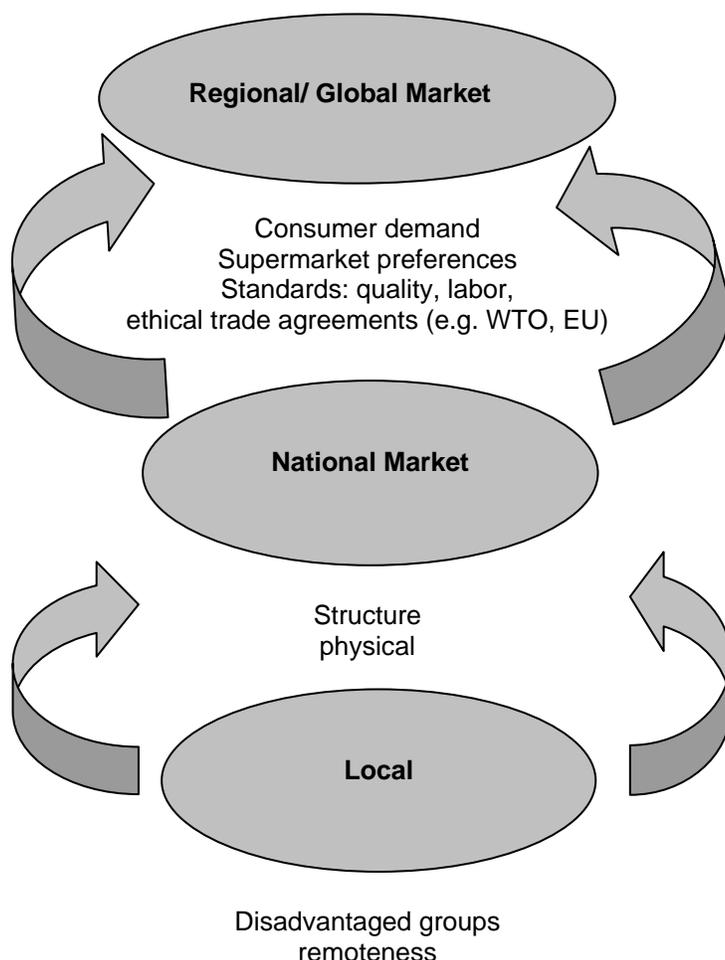
As historical experiences have shown, from 1913 to 1962, Uganda had very strong cooperatives. On attaining independence, the Ugandan government systematically introduced policies wherein the management of unions and societies were eventually replaced by government-appointed agents. Government policy interferences with the cooperative management systems weakened the movement and never prepared it to compete with the private sector. However, supporting collective action by smallholder farmers requires government support to promote producer-based organizations so they can develop business and management skills, establish information systems and connections to domestic and global markets, and create good governance practices and the infrastructure needed to connect small farmers to finance and input supply systems. Effective farmers' organizations provide the necessary political voice to ensure that smallholders can articulate their demands.

Government Policy for Liberalization and Private Sector Participation

Under liberalization policy, the state no longer provides direct markets and service functions to smallholder farmers. This policy has both positive and negative implications, depending on how it is implemented. A case in Uganda: During Idi Amin's regime, the marketing of commercial produces, such as coffee, tea, and cotton, had collapsed. By the 1980s, the government marketing bodies had become inefficient and could not purchase any crops. In such circumstances, smallholder farmers face problems in accessing markets at local, regional, and global levels in most developing countries (as shown in Figure 4).

¹ The role of farmer organizations in relation to agricultural service provision is one of these required institutional innovations, which will lead to organizational innovations in agricultural services provision and other actors in the economic chain, as well as to social innovations in the markets. Farmer groups and organizations are not only instrumental in bringing farmers' knowledge to the forefront in innovation systems, but will also have to enhance their influence on the formal innovation system and get involved in actual agricultural service provision (ICAD 2005).

Figure 4. Barriers to Market Access by Smallholder Farmers



Source: adapted from Rachel and Julie, 2001, p.2.

Note: There are two market-access constraints (1) physical: remoteness/lack of road, high transaction costs/low value-weight ratios; and (2) structural: inequitable and uncompetitive market relations, lack of innovative institutions, government-supported parastatal groups.

On the other hand, however, liberalization assumed that the private sector would provide financial services and undertake agroprocessing, wholesale, and trade. In many cases the private sector needs government support to build capacity and performance efficiently and effectively. In 2003, for example, cereals and legumes could not be exported to any other countries, such as those in eastern and southern Africa, even when there was a food deficit in those countries. To address this, the Ugandan government supported a consortium of private companies by providing warehouse facilities and access to working capital.

Government support with appropriate policies—involving and encouraging private sector participation in market development—can help smallholder farmers access domestic and global market opportunities.

Government Policy for Emerging Market Chains and Smallholders

Marketing chains are also changing and becoming more integrated, and food quality and safety demands have increased. These changes are creating new opportunities for farmers involved in high-value agriculture to compete in and link to these markets. Supermarket standards and the ensuing marginalization of small-scale producers and suppliers is inhibiting smallholder farmers' access to markets. In many cases, smallholders are not yet positioned to compete and access these markets, and many will be left behind if they are not properly organized to meet the standards and qualities required. According to IFPRI 2001, African farmers must become more competitive in export markets if they are to gain market share. Therefore, government policy instruments are needed to provide the necessary support services to enable smallholder farmers to effectively participate in emerging markets. Supermarkets could implement policies that require sourcing a portion of their produce from smallholders as an appropriate contribution to broad-based rural economic development (Bienabe and Sautier 2000). Government can introduce policies that induce supermarkets to train farmers in skills that require meeting handling standards for quality. Policies that are reflected in nontariff barriers, such as EurepGAP — particularly the traceability and equivalence rules — deprive farmers from benefiting from the emerging market chains opportunities.

Government Policies for Decentralization and Support Services

According to IFAD 1995, *decentralization* is an umbrella term for a number of related policy reforms under which central government agencies transfer rights and responsibilities to local institutions. Decentralization is a multidimensional process of shifting the focus of development away from central planning and bureaucratic government agencies and toward community-based participatory systems that use the full range of local public and private institutions.

The political, fiscal, and institutional elements of decentralization are particularly important. Research findings suggest that each element needs to complement the others for effective results to be realized (World Bank 2004). In the case of public services, decentralization most often refers to

- shifting power from central offices to peripheral offices having the same administrative structures;
- giving semiautonomy to field officers for routine decision making; and
- planning functions in accordance with the central government's guidelines.

Ineffective, centrally administered local development programs, as well as weaknesses in rural policies and programs that address local needs, have led to the realization that poverty alleviation cannot be achieved unless the poor have a voice in the planning and implementation of schemes meant to help them. Decentralization's merits include easier access to local information, greater sensitivity to local needs, and accountability to the local community.

Smallholder farmers have not benefited fully from decentralization due to partial implementation, local politics that are counterproductive, and lack of accountability. There are a number of success stories, however, including the decentralization of research and extension in Uganda, where the National Agricultural Advisory Services program represents an ambitious plan to decentralize extension services by scaling up from six pilot districts to national coverage by 2008. An autonomous board coordinates the program at the national level. Local farmer groups are represented in subcounty and district levels, and farmer forums approve project proposals submitted by farmer groups. Funding for projects comes from the program funds, most of which are allocated to subcounty farmer forums. Based on this initial experience, efforts are underway to form an eastern and southern African network of service providers.

Sustainable intensification of smallholder agriculture is crucial to create necessary surplus for the market. Smallholder farmers need access to appropriate technologies and support services to effectively

participate in the transformation process. The agricultural research and development (R&D) system has been undergoing a series of transformations over the years. The reform agenda includes

- redefinition of the role of government in agricultural R&D;
- decentralization and/or privatization of agricultural R&D activities;
- broader and active stakeholder participation (pluralism in service provision);
- increase in networks, partnerships, and new funding arrangements;
- separation of financing from service provision and research execution;
- orientation of R&D to be more outward looking and client- and impact-driven; and
- adoption of a “systems” perspective.

The government introduces policy reforms aiming to foster a more pluralistic, performance-oriented culture in a less-centralized public sector. The whole notion of extension has also changed, so that extension agents are now viewed as service providers and knowledge brokers. Nonetheless, the public sector still has a crucial role to play in providing services to smallholder, subsistence farmers who live in remote areas, far from markets. Decentralization has been used as an instrument to make services more relevant, to bring them closer to the end users, and to enhance ownership and empowerment (Crook and Sverrisson 2001; Jütting et al. 2004; African Governance Forum-V 2002).

Government Policy for Emerging Technologies

The use of modern biotechnology is on the increase in most parts of the world, except Europe and Africa. Concerns about the use of biotechnology in Africa are partially a spillover from concerns in Europe about food safety and environmental issues, as well as public mistrust of multinationals, which are often seen as being manipulative and unscrupulous (Eicher, Maredia, and Sithole-Niang 2005).

If judiciously combined with other technologies to produce food and agricultural products and services, biotechnology represents an undisputable potential to increase production and productivity among smallholder farmers and holds serious promise for the sustainable intensification of agriculture. To fully benefit from new technologies, including biotechnology and information and communication technologies (ICTs), national governments should have a clear vision of what they expect from those technologies and how they can integrate them harmoniously with other options, including the development of conventional technologies.

When dealing with the issue of agricultural biotechnology, countries in Sub-Saharan Africa need to address three major policy issues: appropriate intellectual property rights, biosafety and regulation mechanisms, and national capacities. There is also a clear need for an open exchange of technical information on genetically modified products, training for African scientists, and helping African nations develop their own policies to guide regulatory, legal, and technology transfer issues (Eicher, Maredia, and Sithole-Niang 2005).

Government Policy for Globalization and Smallholder Farmers

The idea of globalization was enthusiastically welcomed by many developing countries based on the assumption that it would provide access to markets in developed countries. Ibi Ajayi (2003) reviewed there are a number of reasons why globalization is being advocated in Africa at this time. The overriding reason is the poor macroeconomic performance in Africa, which is the resultant effect of various factors including colonial history, heavy dependence on primary products, macroeconomic policy errors, extraordinarily disadvantageous geography, ethnic fragmentation etc, and the advantages that Africa can derive from globalization. Africa’s economic marginalization is the resultant effect of isolationist policy and a closed economy approach to economic development. Africa’s exclusion from the global economy accounts for the fact that economic prosperity has eluded most of the continent. The appeal to open up its

economy is based on a simple but powerful premise: economic integration will improve economic performance. Africa cannot and must not remain in a state of isolation as failure to open up its economy will deepen its rate of economic marginalization and further exacerbate the income disparity between it and the rest of the world. Additionally, globalization has the promise of new opportunities for expanded markets, the spread of new technologies and ideas, heightened competition as a spur to achieving world standards of efficiency, and ability to tap cheaper sources of finance at the international level. All these hold out the promise for increasing and greater productivity but also a higher standard of living.

Collier (1997) suggests a number of developing countries, particularly in Asia, have taken advantage of globalization and have made substantial progress toward closing the income gaps relative to the industrial countries. While most other regions have derived significant benefits from the growth in trade and investment, thus fueling their structural transformation, Africa has been marginalized, as its share of world trade, investment, and output declined to negligible proportions.

However, policies that restrict access to the markets of developed economies adversely affect smallholders, depriving them from fully exploiting these market opportunities. Debates surrounding biotechnology, biosafety, the World Trade Organization, and nonmarket barrier issues remain a puzzle to many smallholders, who require increased capacity and income to actively participate in these markets. In this respect, the global economy's potential benefits can only be fully realized when the necessary complementary policies and institutions have been put in place by the respective government. African governments must put in place sound macroeconomic fundamentals and accelerate structural reforms that would make its economies less vulnerable to swing investor sentiments and capital flows. Thus, before smallholder farmers can benefit from globalization, government must initiate some policy changes. Africa's growth prospects and its full integration into the global economy are dependent on its domestic policies, as well as developments at the international level.

Government Policy and Harmonization

Very often, policies are crafted without much consideration for their implications on other policies. In addition, given the forward and backward linkages between the agricultural sector and other sectors of the economy, such as health, education, water, infrastructure, and energy, there is a need for policy harmonization at the national level. Similarly, some policy frameworks proposed by developed countries have implications for smallholder farmers. There is a need to integrate and harmonize various policies to ensure that they do not have a negative impact on smallholder participation in emerging markets.

4. Conclusions

It is increasingly evident that in the majority of Sub-Saharan African countries, smallholder producers are there to stay for the foreseeable future. This paper argues that both politics and policies are intertwined and equally important for smallholder-led, broad-based economic growth. The paper advocates for policies that will lead to market-oriented, smallholder production systems that are compatible with sound natural resources management. Specific policies are needed to promote collective action by farmers, increase private sector participation, facilitate greater participation of smallholder farmers in emerging market chains, and capitalize on the potential benefits of biotechnology. Good policies are necessary, but not sufficient, to create the necessary transformation. To be fully effective, there must be political commitment so that these policies should be followed up with effective implementation plans in terms of strategies, programs, financial resources, monitoring and evaluation systems to detect problems and avoid adverse unintended effects.

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Policy and Politics for Smallholder Agriculture*

Regina Birner, Research Fellow, Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), USA

Danielle Resnick, Research Analyst, Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), USA

1. Introduction

More than 100 years ago, Karl Kautsky (1899) published *The Agrarian Question*. The question he analyzed in this book remains important today: Is there a need and justification for agricultural policies that specifically support smallholder agriculture? Kautsky argued that the peasant producers persisted due to self-exploitation and underconsumption, which were not deemed to be socially desirable situations. Kautsky was convinced of the technical superiority of the large farms and saw no justification for agricultural policies designed to support small farmers.¹ The experience of the 20th century tells a different story: Implementing policies to support the economic development of small farmers proved to be a particularly successful strategy to reduce rural poverty and to use agriculture as an engine of growth on the road to industrialization (Mellor 1976). Both Western industrialized countries and the fast-growing Asian economies document the success of this development strategy. As Lipton (2005) noted, there is virtually no example of mass poverty reduction in modern history that did not start with sharp rises in employment and self-employment income due to increased productivity among small family farms.

Nevertheless, the experience of the 20th century also shows that it is a major challenge to identify and implement agricultural policies that support small farmers in ways that lead to poverty reduction and economic development. Some Asian countries, most notably China, embarked on this strategy only after disastrous results with promoting large-scale farming. The political power of large-scale landowners made a development strategy focusing on small farmers politically difficult in many Latin American countries. In Sub-Saharan Africa, strategies to achieve poverty reduction and economic development by promoting small farmers either were not put in place or did not work well. The number of poor people in this region has almost doubled during the past two decades (Chen and Ravallion 2004). Hence, it is not surprising that the small farm controversy that reemerged at the beginning of the 21st century has a particular focus on Africa. In spite of the success stories of agriculture-led economic development in Western industrialized countries and in Asian economies, the “agrarian question” remains subject to academic and political debate: Can economic development in Africa be achieved by relying on agriculture as the engine of growth? And if so, should a pro-poor agricultural growth strategy rely on small farms?

The controversy over the future of small farms has also been fuelled by the processes of globalization and related fundamental changes in the global food system, characterized by the rise of supermarkets, the increasing importance of private standards and labels, and emerging concerns for ethical and environmental aspects of food production. How these developments influence the available opportunities for small farmers in different parts of the world remains unclear. Will they retain their comparative advantages under these changing circumstances? Will they be able to capture the potential benefits of these new developments? Should agricultural policies address this concern, and if so, which policies are most suitable?

This paper aims to contribute to the small farm controversy by focusing on the political dimension and the political feasibility of agricultural policies that seek to use agriculture as the engine of pro-poor growth by relying on small farms. The reason for this focus is twofold: First, economic

* The authors wish to thank Michael Lipton and William M. Rivera for their valuable comments.

¹ Karl Kautsky, the leading theorist of the German Social Democrat Party (SPD) at the time, debated this question because the southern branch of the SPD demanded the inclusion of agricultural policies to support smallholder agriculture in the party's program to attract the political support of small farmers and rural laborers. Unlike Lenin, Kautsky came to the conclusion that the peasantry may well persist in a capitalist system. However, he did not consider the peasantry as a progressive force that could play an active role in the envisaged socialist revolution.

theory has come a long way, especially in the second half of the 20th century, to better understand the role of agriculture in economic development. Major advances have been made by applying the concepts of induced innovation and new institutional economics, such as transaction costs economics, agency theory, and property rights analysis, and by taking into account specific material conditions in agriculture and the role of risk and uncertainty. As Binswanger (2004) noted, the economics of agricultural development is a mature field, and its major insights are well established. In contrast, the politics of agricultural policies in developing countries are less well understood. The classics in this field, such as de Janvry's (1981) *The Agrarian Question and Reformism in Latin America*, Bates's (1981) study on the political foundations of agricultural policies in Africa, and the study on the political economy of agricultural pricing policy by Krueger, Schiff, and Valdés (1991), were conducted in the 1970s and 1980s. Binswanger and Deininger (1997) extensively reviewed the state of knowledge in this field and observed that "we are a long way from being able to explain the differences" in the agricultural policies adopted by different countries. They concluded that "there is a great need to develop a more unified theory of a political economy of agriculture and agrarian relations that can be tested empirically" (p. 1999).

Second, not only does our knowledge of the politics of agricultural policies in developing countries remain limited, but also the major political frame conditions for agricultural policymaking have changed considerably since the classics in this field were written. The most notable change is the global wave of democratization during the past two decades. Diamond (2003) noted that since the "third wave" of democratization began in 1974, the number of democratic countries has grown threefold from 41 to 121 by 2002.² Although democracy is widely acknowledged to be a goal in its own right, the implications for agricultural policies and the future of small farms remain unclear. As the cases of China or Indonesia under Suharto show, countries that historically were successful in promoting economic development with agricultural policies supporting small farms were not necessarily democracies.

Another major change is a global trend toward decentralization. Although there have been several waves of decentralization during the past 50 years, more recent decentralization trends focus on political decentralization, which refers to the transfer of authority to locally elected bodies. A third major change is the rise of civil society. From the global to the local level, nongovernmental organizations (NGOs) have come to play an increasingly important role, so much so that they are now characterized as the "third sector," after the public and private sectors. A fourth change is the increasing relevance of participatory policy processes. For example, the poverty reduction strategy papers have become a major policy instrument that is supposedly based on a broad consultation of different stakeholders. As with the case of democratization, the implications of these developments for agricultural policymaking remain unclear.

Against this background, the major arguments presented in this paper can be summarized as follows:

1. The specific material conditions of the agricultural sector cause different types of externalities and market failures. Therefore, there is a need for policies that address these market failures and promote an agricultural-led development strategy that is pro-poor and centered around small farms. The requisite policies depend on the country-specific frame conditions and will change during the course of economic development.
2. The material and socioeconomic conditions of agriculture also influence the political process of agricultural policymaking. Together with a political rationale for low food prices, they lead to inherent problems regarding the political feasibility of policies that would be required to promote agricultural-led, pro-poor development. Policy instruments that would be useful to support small farm-based economic development, such as price stabilization measures, either are not put in place or are used to exploit, rather than to benefit, small farmers. Other policy instruments, such as input subsidies, often tend to benefit large farmers more than small farmers. Moreover, policy instruments to support

² Diamond (2003), however, added that these totals reflect electoral democracy rather than fully consolidated democracies.

agricultural development are difficult to remove, even if the market failures that justified their implementation disappear.

3. The major strategy to address these problems of policy intervention, especially during the 1980s, was to withdraw agricultural support policies and to reduce public sector involvement in agriculture. International development agencies played a leading role in promoting these policy reforms. The effects were mixed: Those farmers who were previously discriminated against by the respective agricultural policies benefited, but other farmers remained exposed to the lingering market failures that remained unaddressed after the withdrawal of public sector involvement.
4. Based on the experience of the policy reforms during the 1980s, there is an increasing recognition of the need for policies that promote pro-poor, agricultural development. There is also an increased donor interest in this field. However, given the changing political circumstances, it remains unclear to which extent such policies are politically feasible and how they can avoid the negative experiences that gave rise to the policy reforms of the 1980s. While the international debate is characterized by a strong focus on the private sector and NGOs to overcome these problems, this paper highlights the role of collective action among smallholders and the continuing, albeit changing, role of the public sector. The implications are that improvements are needed in public sector governance in order to achieve pro-poor, agricultural development.
5. Research can contribute in two major ways to meet the challenges involved in policies and politics for smallholder agriculture. One field of research is normative policy analysis, which aims at identifying “smart” policy instruments that fit into the country-specific frame conditions and that avoid the problems of market failure and government failure that proved to be inherent in agricultural development. Analytical concepts from institutional economics, organizational theory, and public sector management are useful in this regard. The second, and closely related, field of research is positive policy analysis, which aims at better understanding political processes and, thus, the political feasibility of policies supporting pro-poor agricultural development. This type of research will benefit from analytical perspectives that take into account both material interests and the role of ideas, ideology, and discourse in political decision making; that capture the nature and sequencing of political processes; and that address the politics of implementing policy reforms.

To elaborate on these arguments more fully, the paper is organized as follows: Section 2 summarizes the state of knowledge on those agricultural policies that are conducive to generating pro-poor agricultural growth by relying on small farms. Section 3 reviews the various analytical approaches used to explain the political factors and processes that favor or discourage the adoption of these policies. Considering the focus on Africa in contemporary debates on the future of small farms, section 4 highlights the challenges facing African smallholders today across various subsectors and examines unresolved issues regarding the appropriate roles of the public, private, and third sectors. Given the dearth of recent research on the politics and policy processes surrounding the agricultural sector, section 5 proposes some possible approaches for narrowing key knowledge gaps in this area, while section 6 concludes.

2. Policies for Pro-poor Agricultural Growth: Rationale and Phases

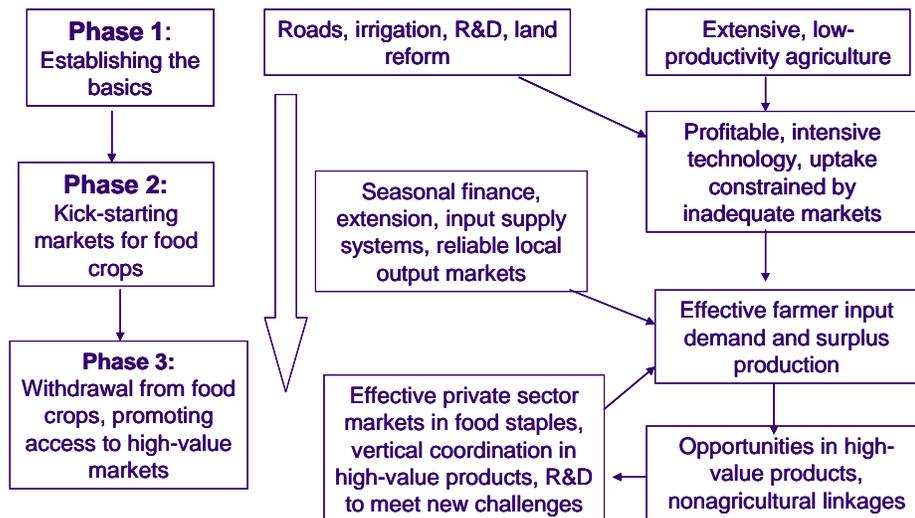
Insights from applying transaction costs economics and principal-agent theory to agricultural production suggest that, due to the specific material conditions of agriculture, family labor has a comparative advantage over hired labor in most farming systems (Pollack 1985; Schmitt 1991; Binswanger, Deininger and Feder 1996; Birner 1999; Lipton 2005). The transaction costs of hired labor in agriculture are typically higher than in the industrial sector due to the spatial dimension of agricultural production, the dependence on biological processes and weather conditions, the role of idiosyncratic knowledge, and the care intensity of agricultural activities. Plantation crops, such as tea

and sugarcane, which can be grown in monoculture and with group labor, as well as livestock operations that do not depend on land, such as intensive poultry production, are exceptions to this pattern.³

If small farms indeed have a comparative advantage over large farms, then why is there a need for explicit public policies to support them? One could argue that the removal of policies that discriminate against them would be sufficient to support agricultural growth led by small farms. The rationale for public policies that support small farmers is based on the insight that the material determinants of the production relations in agriculture give rise to different types of market failures (Binswanger and McIntire 1987; Binswanger and Rosenzweig 1986; Schmitt 1991; Binswanger and Deininger 1997). Apart from the conditions mentioned above, particular problems are caused by large variations in weather and prices, which lead to covariance of risk. Petit (1995) summarized the market failures in agriculture as based on externalities, public goods, moral hazard problems, market monopolies, and infant industries. Policy intervention is also justified if the market fails to produce socially desired outcomes due to other reasons. Examples are social safety nets, redistributive policies, and affirmative action policies for disadvantaged groups.

Andrew Dorward et al. (2004) recently reviewed the institutions and policies for pro-poor agricultural growth based on theoretical arguments, historical evidence, and economic modeling. Because the types of market failures change in the course of development, the authors suggested that it is useful to distinguish three policy phases in supporting the agricultural transformation. This approach, which necessarily has to rely on stylized facts, is presented in Figure 1.

Figure 1. Policy phases in supporting agricultural transformation



Source: Adapted from Dorward et al. (2004)

Phase 1 characterizes extensive, low-productivity agriculture in a low-income economy, which is typical of the pre-Green Revolution era in Asia and for many countries and regions in Africa today. As Dorward et al. (2004) show, policies in this first phase need to focus on the interventions that are necessary to create the basic conditions for improving the productivity in food crop

³ Economic theory also suggests that family farms allocate labor according to the average, rather than the marginal, value product. This is an advantage in situations characterized by underemployment and scarcity of capital, as is typical for developing countries. Of course, it is also the mechanism behind the self-exploitation and underconsumption described by Kautsky (1899).

production. Investments in agricultural research, in roads, and, where appropriate, in irrigation infrastructure are essential. If access to land is highly unequal, land reform is another important policy intervention for creating the conditions for pro-poor agricultural growth. Broad-based agricultural growth remains difficult to achieve in countries that have a persistent unequal land distribution, as demonstrated in large parts of Latin America.

Once the basic conditions are in place, the uptake of productivity-increasing technologies is, however, likely to be limited to farm households that have better access to seasonal finance and to input and output markets. In this phase 2, the development of markets is seriously affected by the material conditions of agriculture, such as the spatial distribution of agricultural production and its inherent risks. As long as the transaction volumes remain low, these conditions lead to market failures. Therefore policies can play an important role in kick-starting markets (Dorward et al. 2004).

To make poverty reducing broad-based agricultural growth possible, it is important to invest in institutions that provide agricultural services (especially extension and rural finance) and in the development of input supply systems and reliable local output markets. Creating an environment that enables collective action among farm households in the form of credit groups and producer associations is also important to address these market failures more effectively.

When agricultural production takes off, the transaction volumes for inputs, outputs, and services increase, and farmers learn how to use and adapt new technologies. Hence, the reasons that gave rise to market failures in the food staple sector are less relevant, and state intervention in these areas should be withdrawn (phase 3).

When applying this framework to better understand policies and politics for smallholder agriculture, it is useful to distinguish among the economic characteristics of staple food crops, traditional export crops, and nontraditional and high-value crops.

1. Figure 1 suggests a sequence in which the development of food staple crops precedes the development of the high-value and nontraditional crops, based on evidence that, depending on the country-specific conditions, this phasing will have a higher impact on poverty (Diao and Hazell 2004). Obviously, the model displayed in Figure 1 is highly stylized and needs to be adjusted for the specific conditions of each country. Importantly, geographic conditions play a central role; depending on their location, some regions of a country will develop faster and reach the different phases earlier than other regions do. Hence, different types of policies may be required for different regions and different subsectors within the same country.
2. Traditional export crops play an important role in many developing countries. While one can, in principle, distinguish the same three phases of policy support for these crops, they were often already introduced during colonial times, together with the basic infrastructure and institutions needed for input supply, marketing, and price stabilization. As discussed below, these crops differ from food crops with regard to the interest of and the possibilities for governments to control this sector. Moreover, these crops are typically plantation crops and therefore not necessarily dominated by small-scale producers, as indicated above.
3. Economic growth in the nonagricultural sector, rising per capita income, and the integration of global markets change the structure of the demand for agricultural products. This creates opportunities for high-value products, such as milk and animal livestock products, fruits, vegetables, and flowers. Pro-poor agricultural policies in this sector need to focus on enabling small farmers to make use of these opportunities, which are also subject to market failures due to the perishable nature of these products and subsequent “hold-up” problems.⁴ Different forms of vertical integration, ranging from

⁴ This term is used in transaction costs economics (Williamson 1985). It refers to situations where one contracting party can take advantage of the other—for example, because the other party has no alternatives. While Williamson deals with specificity

cooperatives to contract farming, can address these problems, but the options that contribute most to promote pro-poor growth depend on the sector and the frame conditions. Changes in the global food system, such as the rise of supermarkets and rising private standards, create additional challenges, especially for small farmers. Agricultural research, extension, and education need to focus on these new challenges, and this typically requires collaboration with various actors along the value chain and a greater role for the private sector.

4. Since the agricultural transformation is associated with different types of negative externalities, policies are also needed to address these externalities. The expansion of agricultural production into range lands and forested areas, which is characteristic for the earlier phases of agricultural development, requires institutions to mediate conflicting interests in land use that may arise between different groups of users (e.g., pastoralists versus crop farmers) or between land users and the society at large (e.g., in the case of forest conservation). With the intensification of agriculture, policies and regulation that prevent potential environmental or food safety hazards are required, as in the case of pesticides or genetically modified crops.
5. Throughout the agricultural transformation process, there is also a need for institutions that protect particularly vulnerable groups and that mitigate against shocks. In this regard, social safety nets that contribute to pro-poor growth are an important public policy.

3. Explaining Agricultural Policy Choices

The need to deal with the various market failures discussed in the previous section calls for agricultural policies that effectively address these failures in order to achieve pro-poor agricultural development. However, as indicated in the introduction, the experience of the 20th century shows that only a few countries were indeed able to implement such policies. Therefore, it is essential to analyze the political economy of agricultural policy choices. In explaining the adoption of past agricultural policies in developing countries, researchers have often placed emphasis on a particular theoretical perspective (see Binswanger and Deininger [1997] for a review). Methodologically, qualitative ex post interpretations of empirically observed patterns are a dominant approach in this literature.⁵

The Role of Interest Groups

Interest group, or society-centered, explanations of policy outcomes often focus on the ability of different rural and urban groups in society to overcome collective action problems, organize themselves as political interest groups, and exercise political pressure to the extent possible under the prevailing political regime. As a large, spatially dispersed group with heterogeneous interests and limited access to education and to communication and transportation infrastructure, small farmers in developing countries face numerous obstacles to engage in collective action and defend their interests. Their incentives to engage in political action are often limited by their poverty, which results in short time horizons and high risk aversion. Large farmers and other members of the rural elite are in a better position to overcome these obstacles and become effective political interest groups. Compared with small farmers, urban dwellers—particularly commercial, industrial, and bureaucratic elites—have the advantage of spatial concentration and can exercise political pressure in the form of demonstrations and revolts without major organizational requirements. According to this approach, the coalitions of interest groups that dominate the state determine the choice of agricultural policy

of investment as a reason for “hold-up” problems, farmers are obviously in a similar situation if products are perishable and high transport costs limit competition among traders and processes.

⁵ Quantitative public choice approaches to explain agricultural policies are more frequently found in the literature dealing with industrialized countries. For examples, please see Anderson and Hayami (1986); MacLaren (1992); and Swinnen, Banerjee, and de Gorter (2001).

instruments. Food prices have often been the nexus where conflicts between urban and rural interest groups occur.

This interest group approach, which is prevalent both in Marxist and neoclassical public choice approaches, helps explain why it has proved politically difficult to implement the agricultural policies that promote smallholder agriculture (Binswanger and Deininger 1997). The approach suggests that small-scale farmers in the food crop sector face particular difficulties in influencing agricultural policies, since these crops dominate production in the poorer and more remote areas where the capacity for collective action is low. Moreover, the political rationale to keep food prices low will affect, in particular, the farmers involved in food crop production. Therefore, one can expect that the agricultural policies needed in phases 1 and 2 from the model in Figure 1 are politically difficult to achieve. The interest group approach also suggests that policies implemented in these two phases are more likely to benefit large-scale farmers who are politically more powerful and who can be co-opted by such policies or compensated for the taxation of agriculture by agricultural pricing policies and macroeconomic policies. For the same reasons, policies that subsidize inputs that can be used individually by rural elites, such as credit and fertilizer, are more likely to be implemented than policies that provide public goods, such as roads. Accordingly, one can also expect a tendency to target the infrastructure investment needed to “establish the basics” (phase 1) according to political rather than economic considerations. The interest group approach also helps explain why one can expect political difficulties in withdrawing state support for agriculture in phase 3, when market failures that justified such interventions have been overcome.

In addition, the interest group approach implies that smallholders in the traditional, or cash crop, subsector share many of the same difficulties of those involved in food crops. However, due to the nature of their production, the former often have slightly better access to roads and output markets and a greater capacity for collective action around particular commodity-based organizations. As a major source of foreign exchange, this subsector cannot easily be ignored by policymakers. As such, it has been the recipient of both state predation, through overvalued exchange rates, marketing boards, and export taxes, and state beneficence, through subsidized inputs, assured output markets, and investments in agricultural research and technology.

Political economy arguments also offer some explanation of the historic variation in government treatment toward particular crops. For example, Leonard and Strauss (2003) claimed that the higher sunk cost of tree crops, such as cocoa and coffee, and the higher international prices those crops command relative to labor costs reduce incentives to switch to another crop and help explain why producers have historically been taxed. By incorporating a measure of politicians' discount rates, McMillan (2001) found that leaders with a higher probability of remaining in power tax less heavily. In addition, McMillan and Masters (2000) found that governments with a high discount rate tend not only to heavily tax those agricultural commodities with high fixed costs, such as tree crops, but also to invest less in agricultural research and development (R&D). Sarker, Meilke, and Hoy (1993) also employed a political economy model to understand the exploitation of wheat farmers in 13 developing countries between 1958 and 1987. They estimated the political weight of wheat farmers according to factor endowments, agriculture's share in employment, agriculture's share of gross domestic product (GDP), agriculture's international terms of trade, the extent to which imports are financed by agricultural exports, and the share of food in disposable income. They found that in developing countries, a high degree of the workforce is employed in wheat production, which makes collective action among farmers much more difficult. At the same time, wheat farmers enjoy high, international terms of trade, and therefore producers received little sympathy from the rest of society. Yet, the share of total imports financed by wheat exports is relatively low, which translates into a marginal influence over government policies.

The literature also highlights the fact that conflicts between urban and rural interest groups over agricultural policies can become manifested in a variety of ways. For instance, in *Weapons of the Weak*, Scott (1985) described various forms of everyday resistance to which relatively powerless groups in peasant societies may resort: foot-dragging, pilfering, slander, or sabotage. According to Bates (1981) and Binswanger, Deininger, and Feder (1996), more extreme forms of resistance by farmers have been met with state-sponsored violence under more oppressive political regimes.

The Role of Unintended Policy Consequences

Research on the political economy of agricultural policies has also revealed that the sequence of policy change in different countries can only be understood if the unintended consequences of policy instruments are taken into account (Bates 1981; Krueger, Schiff, and Valdés et al. 1991). This is a more state-centered explanatory approach that focuses on the political motives of governments, which may include political and social objectives, such as food self-sufficiency, low food prices for consumers, and fair prices to producers, as well as macroeconomic objectives, such as low inflation and foreign exchange earnings (Krueger, Schiff, and Valdés et al. 1991). Agricultural policies that are put in place to achieve these different goals may have unintended consequences that conflict with other goals and hence stimulate policy change. Unintended consequences include the creation of opportunities for rent-seeking, distortions in other sectors, unexpected difficulties in implementing and enforcing the respective policy instruments, and fiscal problems. Methodologically, however, it is difficult to determine to which extent the consequences of a policy instrument, such as greater capture by interest groups, were indeed unknown and unintended. In any case, there is considerable evidence that prior to the policy reform of the 1980s, policies implemented to correct previous policy failures only increased the complexity of agricultural policies and administration (Krueger, Schiff, and Valdés 1991). There is also evidence that the liberalization reforms of the 1980s led to unintended consequences (see section 4), especially for small farmers in the food staples sector, because they ignored the market failures discussed in section 2.

The Role of Ideas, Ideology, and Knowledge

Policies are driven not only by material interests but also by ideas, ideologies, and knowledge. Policies that taxed agriculture in order to finance rapid industrialization have been explained by the notion of “African socialism,” as well as dependency theory, both of which justified taxing agriculture to rapidly industrialize (Collier and Gunning 1999; Krueger, Schiff, and Valdés 1991). This policy also corresponded with mainstream economic thinking at that time. As Bates (1981) noted, many African leaders who had made great sacrifices in the struggle for independence had studied the leading development economists of their time and applied policies that taxed agriculture with the intention of promoting economic development. In the 1970s, research on the policy distortions against the agricultural sector and its negative impact on poverty and growth helped place policies in support of the agricultural sector on the international political agenda. Mirroring the general trend in development thinking, the “neoliberal counterrevolution” of the 1980s, which emphasized government failure and the “mantra of getting prices right” (Wolfensohn and Bourguignon 2004), advocated the withdrawal of public sector intervention in agriculture. Since the 1990s, international development thinking has been influenced by the failure of structural adjustment policies to reduce poverty. This experience fostered an emerging consensus in the international development community regarding the need to better understand the complementary roles of the state, the market, and the third sector and to “get institutions right” (see Section 5).

Paarlberg and Grindle (1991) are among the few authors who have analyzed how trends in international thinking influenced agricultural policies in developing countries. They contrasted the reform imperatives of the 1970s, which were production-oriented and sector-focused, with the reform imperatives of the 1980s, which had a macro- and cross-sectoral orientation. The authors showed that the actors involved, their concerns, and the implications for the implementation and sustainability of the reforms differed considerably between the two approaches.

The concept of ideas and ideology has been used in a rather broad sense in the literature on agricultural policies, referring not only to specific political ideologies, such as socialism, but also to more general trends in the international literature on economic development and corresponding policy prescriptions. Efforts to integrate arguments focused on interest groups with those focused on ideology remain scarce. This reflects the methodological difficulty of disentangling whether ideologies influenced agricultural policies directly or whether they were mainly used to legitimize the interests of powerful groups. As Binswanger and Deininger (1997) noted, “the impacts of ideas as generators and

facilitators of policy change” is “one of the areas where our knowledge is still very limited and poorly integrated across subfields and schools of social science” (p. 1999).

The Role of Donors and Type of Political Regime

In the literature on the politics of agricultural policies in developing countries, two interrelated factors have received less attention than the role of societal interest groups, unintended policy consequences, and ideologies: the role that donor agencies play and the way in which the type of political regime influences political choices. As described in the discussion about idea, ideology, and knowledge, international agencies play an important role in promoting changes in development thinking. Donor agencies, especially the international financial institutions, have also influenced political choices directly through conditionalities. This influence was rather direct during the structural adjustment period, but has since been replaced by an approach that focuses more on country ownership (Wolfensohn and Bourguignon 2004).⁶

There is evidence that the effect of donor intervention depends on the type of political regime, even though this issue has not been systematically analyzed for agricultural policies. Wane (2004) found that development aid is more effective if the recipient state has the capacity to negotiate the terms of assistance. In addition, aid can often undermine the institutional capacity of the recipient country by fostering corruption, reducing governments' accountability to their citizens, and increasing administrative complexity in response to donors' reporting requirements (Bauer 1991; Bates 2001; Easterly 2002; Herbst 2000). In analyzing the relationship between economic reforms and international development assistance, van de Walle (2001) criticized the dominance of society-centered interest group approaches to explain economic policies. In his perspective, these approaches assume a high degree of organizational capacity and mobilization among Africa's population, which simply has not existed under the political regimes ruling in the post-colonial era. Rather, he advocates a state-centered approach that focuses on the problem of neopatrimonialism, which is characterized by presidentialism, clientelism, and the misuse of public resources. Perhaps motivated by the wave of democratization, there is also an increasing literature that applies concepts of constitutional public choice to examine how the type of political regime (especially presidential versus parliamentary types) influences economic policies (see, e.g., Keefer and Khemani 2003). Yet, while the interaction among donors, aid, and political regimes has been examined in terms of broad economic policies, future research would benefit from assessing its impact on agricultural policies as well.

4. The Politics of Agricultural Policies: Past Lessons and Current Circumstances

Agricultural Policies in the Pre-structural Adjustment Era: Magnitude of Intervention

The content and impact of agricultural policies during the pre-structural adjustment era have been widely analyzed. For the reasons discussed in the previous section, the agricultural policies prevailing in developing countries at that time typically discriminated against agriculture through both direct and indirect mechanisms. The degree of discrimination varied by country and by commodity. The comparative study by Krueger, Schiff, and Valdés (1991), which included 18 countries and analyzed the time period between 1960 and 1985, found that the indirect tax on agriculture from macroeconomic policies, such as overvalued exchange rates, was three times the direct tax on agriculture, such as export taxes. The study also uncovered another trend: Export crops tended to be discriminated against while import-competing crops were often protected.

In this study, Côte d'Ivoire, Ghana, and Zambia had the highest degree of discrimination against agriculture, with an average total nominal protection rate of -52 . The fact that the dominant political party after independence in Ghana and Zambia had a strong urban base may have

⁶ For the World Bank, the introduction of the Comprehensive Development Framework in 1999 was instrumental for this change. The framework stresses country ownership, partnership, and the recognition of using a holistic, long-term vision of a country's needs as basis for development assistance.

contributed to the strong bias against agriculture in these countries (Bates 1983, 1989; Collier and Gunning 1999; Krueger, Schiff, and Valdés 1991). Krueger noted that a similar pattern in which agricultural policy is influenced by the rural or urban origins of the ruling party also appeared in Sri Lanka, Pakistan, Malaysia, Argentina, and Chile. Of the 18 countries included, only Korea and Portugal had policies that were favorable to agriculture with mildly positive protection rates. The average rate of economic growth in these two countries was double that of the three countries with the highest discrimination against agriculture. In the other countries included in the study, protection rates varied from -44 to -8.

A particularly interesting group of countries includes those that, following the earlier lead of Korea and Taiwan, reduced agricultural taxation in the 1970s and started to support smallholder agriculture through more favorable macroeconomic policies, social services, research and extension, and viable smallholder credit systems. As indicated in section 2, these policies are needed to “get the basics right” and “kick-start agricultural markets.” Countries in this group include Indonesia, Malaysia, and Thailand (Binswanger and Deininger 1997). The results have been impressive, most notably in China, where agricultural output grew by more than 6 percent per year in the first 15 years after the reform.

The explanatory approaches presented above cannot adequately explain why a policy change occurred in this group of countries in favor of supporting small farmers. They are all dominated by family farms rather than by a dualistic agrarian structure, which indicates that rural elites played a more limited role. However, this is not a sufficient explanation, since countries that discriminated heavily against agriculture, such as Ghana and Zambia, also had agrarian structures dominated by family farms (Binswanger and Deininger 1997). The case study on Malaysia in the project by Krueger, Schiff, and Valdés (1991) suggests that the political goal to reduce ethnic tensions played an important role in implementing policies that benefited small farmers, who were mostly Malay. Based on interviews with key figures of the agricultural reform process in China, including Du Runsheng, an ongoing study by Xiaobo Zhang⁸, Research Fellow at IFPRI, suggested that experimentation and learning from local initiatives, together with the experience of past hunger crises and the political imperative to avoid a new crisis, played an important role in the introduction of the household responsibility system, which restored the individual household as the main unit of production in rural areas.

Agricultural Policies in Contemporary Africa

In contrast to the literature on agricultural policymaking before the early 1990s, there exists less analysis of the politics of agricultural policy in the contemporary context. As discussed in the introduction, this is surprising given that both political systems and agricultural policies have changed quite substantially.

This section focuses on the current challenges and opportunities facing particular agricultural subsectors. It concentrates specifically on Sub-Saharan Africa, which is a major focus of the current smallholder controversy. What emerges is a recognition that many of the same market failures that promoted government intervention during the pre-structural adjustment period still exist today. Thus, it raises questions about how governments should react in order to help small farmers overcome these market failures, which types of government interventions are politically feasible, and how government intervention can avoid the mistakes commonly seen in the 1970s and 1980s.

⁷ The magnitude of discrimination revealed in this study has to be interpreted with some caution, since a later study that used general equilibrium modeling to determine the policy bias found that the magnitudes found by Krueger, Schiff, and Valdés may have been overstated (Jensen, Robinson, and Tarp 2002).

⁸ Personal communication, May 26, 2005.

Food Crop Sector

Prior to the 1980s, subsidized inputs and grain marketing boards were intended to encourage high food production and low prices, thereby appeasing potentially militant urban constituents (Bates 1981). As a result, this often led to a focus on commodities that were not appropriate for agro-ecological conditions or for the rural incomes of food crop producers. For example, during the 1970s and 1980s, Cameroon, Nigeria, and Senegal frequently subsidized rice production, even though most farmers were involved in the production of sorghum, millet, cassava, and yams (Lele 1989). In Zambia, the government's subsidization of maize production until the 1990s resulted in the production of this drought-prone commodity in areas where the productivity of other staples crops would have been more appropriate (Thurlow and Wobst 2004). Nonetheless, there were important variations to this trend. If elites were involved in the production of a food crop, they were less likely to use policies to depress prices. Bates (1981) also pointed to enforcement problems in the policies applied to food crops. Local administrators in some countries smuggled food crops across borders to take advantage of low domestic and high world market prices.

While the liberalization policies of the 1980s removed some of these distortions, there is some evidence that they often left food crop smallholders disadvantaged vis-à-vis those in other subsectors. For instance, as of 1998, 59 percent of Ghanaian food crop farmers remained in poverty, compared with 68 percent in 1992. On the other hand, export crop farmers, particularly those involved in cocoa, experienced a decline in poverty from 64 to 38.7 percent over the same period (McKay and Aryeetey 2004). Likewise, in Burkina Faso, cotton farmers witnessed a 15 percent reduction in poverty between 1994 and 2003, compared with a 7 percent reduction among food crop farmers (Grimm and Günther 2004).

These observations are in line with the considerations presented in section 2, which suggest that market failures require public sector support in food staple crops. Indeed, Pletcher (2000) explains that in Zambia, the lack of benefits for the private sector played a key role in the sequencing of maize market liberalization. While truckers, traders, and processors all lobbied for the liberalization of maize output markets, no such coalition existed for input markets. Often, the private sector in this subsector has been dominated by petty traders who cannot make bulk purchases and cannot facilitate the transfer of food production between surplus and deficit areas. It is now widely recognized that governments are responsible for the provision of those public goods, such as infrastructure, that would enhance smallholders' access to markets and increase incentives for the private sector (World Bank and Department for International Development 2005; Dorward et al. 2004).

In regard to market intervention, however, considerable debate remains about the public sector's role and what form this intervention, if any, should take. Even if governments recognize that there is little viable alternative to their intervention, it is unclear whether low-income African governments can afford this intervention and how it should be prioritized over other crucial investments for smallholders. Donors can help provide some of the critical financial gaps, but this solution often leads smallholders vulnerable to the vagaries of donor priorities and could potentially further divorce government responsibility for this subsector. One possibility is, for those countries that are eligible, the targeting of funding under the highly indebted poor countries (HIPC) initiative for agricultural inputs. This has been the tactic of the Burkinabé government, which in the HIPC framework has distributed free seeds and fertilizers to the poorest provinces. Consequently, the proportion of cereal-producing households using fertilizers has increased from 19 to 57 percent between 1998 and 2003, even though only 4 percent of these households have access to credit (Grimm and Günther 2004).

Besides threatening macroeconomic stability, public sector support remains controversial because of its potential to lead to unintended consequences. As the experience of the 1960s and 1970s discussed above shows, the ability to ensure that smallholders benefit from interventions in the input markets requires not only strong managerial capacity but also the ability of the state to insulate itself from pressures levied by commercial producers in this subsector. The extent to which the problems experienced earlier can be avoided thus depends, among other things, on the relation

between state capacity on the one hand and the dominance of large-scale farmers in the food crop sector and rural-urban power dynamics on the other hand.

There is also some evidence that the rise of democracy in Africa can create incentives for governments to support small-scale farmers in the food crop sector to ensure political support. For example, to quickly ensure its legitimacy after Malawi's first multiparty elections in 1994, the United Democratic Front government of President Bakili Muluzi engaged in an interventionist strategy in the agricultural sector that was scaled up by 1998 to a Starter Pack Program of free seeds, fertilizer, and extension services for maize producers (Harrigan 2003).

The considerations presented in section 2 also draw attention to the question of how and when such intervention should ultimately be removed (phase 3). The justification for public sector support is based on the rationale that the measure is temporary and should be removed as economic growth takes off and a virtuous cycle of investment and entrepreneurship emerges. However, there is a danger of such a cycle failing to emerge, causing an expansion of support and in turn increasing the difficulty of removal. This emphasizes Harrigan's (2003) observation that "the synchronization of state retreat from agriculture with the development of a private sector capacity remains a key policy issue throughout much of the Sub-Saharan region" (p. 859). The growing presence of democracy in Africa requires governments to balance the needs of multiple constituencies and the removal of subsidies may not be as politically feasible as under authoritarian regimes. In fact, the successive intervention into Zambia's maize input markets generated heated opposition when the ruling Movement for Multiparty Democracy government eventually wanted to liberalize. Pletcher (2000) claimed that "proceedings became unruly" in Zambia's parliament when opposition MPs introduced a motion that would require the government to play a more active role in the provision of inputs (p. 139).

Traditional Export Crop Sector

As a major source of foreign exchange and government revenue, especially in countries lacking mineral resources, the traditional export sector was usually the main target of discriminatory agricultural policies (Krueger, Schiff, and Valdés 1991). Marketing boards may have protected producers in this subsector from world price volatility, but they also provided the resources for investing in large-scale infrastructure and industrialization projects that were disproportionately concentrated in urban areas (Bates 1981). Once again, however, political motives supplemented economic incentives. In Sri Lanka and Malaysia, political parties relied on small-scale food crop farmers for support, and they therefore preferred to tax large-scale traditional export farmers who were less politically active. Moreover, in countries where traditional export crops were a crucial input into domestic manufacturing industries, manufacturers used political leverage to lobby for the continuation of such taxes and thereby to ensure cheaper inputs (Krueger, Schiff, and Valdés 1991).

In African countries where the export crop sector was heavily taxed, the reforms of the 1980s and 1990s that abolished such policies can be expected to have favored small farmers. However, to the extent that farmers benefited from price stabilization, the removal of this policy can be expected to increase their vulnerability. The different practices in this subsector across countries provide greater insight into the circumstances under which liberalization proved disadvantageous.

For instance, in Burkina Faso, the government favors the production of cotton, which comprises almost 60 percent of total exports. Cotton production increased steadily after the 1994 CFA Franc devaluation, and this development, combined with the price support offered by the government marketing board, SOFITEX, allowed the cotton sector to experience growth of 250 percent between 1994 and 2003 (Grimm and Günther 2004). In Ghana, agricultural reforms implemented at the end of the 1980s resulted in priority attention for the cocoa sector relative to food crops, and although the international price for cocoa fluctuated throughout the 1990s, cocoa producers continue to receive a guaranteed price from Ghana's Cocoa Board (Cocobod). Stable prices helped the sector grow and enabled cocoa exporters to experience some of the largest decreases in the incidence of poverty, from 64 percent in 1991–1992 to 39 percent six years later (McKay and Aryeetey 2004).

In Uganda, however, the coffee sector was liberalized and the Coffee Marketing Board was dismantled in 1991. Consequently, coffee producers were able to benefit from the world price of coffee, which peaked during the 1994–1995 growing season. Indeed, households located in Uganda's coffee districts experienced more than a 50 percent decline in poverty between 1992 and 1999 (Kappel, Lay, and Steiner 2004). However, the plummet of world coffee prices in 1998, which reached its nadir in 2001–2002 and has yet to fully recover, played a direct role in the subsequent rise in rural poverty between 1999 and 2003, particularly in the coffee districts and among broader crop agriculture (Okidi et al. 2004; Kappel, Lay, and Steiner 2004).

Based on these divergent experiences, it appears that the public sector may still have an important role to play. Indeed, the volatility of commodity prices for traditional crops may necessitate some form of government price support. This may be particularly true for those commodities that are highly subsidized by industrialized countries, such as for cotton. Through SOFITEX, the Burkinabé government can at least ensure a stable income for cotton smallholders in the face of the \$3 billion in subsidies bestowed upon producers in the United States, the European Union, and China by their respective governments. Indeed, this highlights an additional advocacy role for the public sector, such as promoting fair access to world markets. The Cotton Initiative submitted jointly to the World Trade Organization by Benin, Burkina Faso, Chad, and Mali highlights the value of collective support by regional African governments for particular commodities critical to those countries' economic growth.

On the other hand, price volatility is a good indicator of the inevitable vulnerability of the traditional crop subsector and those employed within it. Without price support, this may, over the long term, encourage greater diversification into higher value-added processed products, such as textiles and chocolate. In Uganda, the fall in coffee prices has also led the governments to place greater emphasis on nontraditional exports that have a high level of smallholder participation, such as vanilla and fish (Kappel, Lay, and Steiner 2004).

Due to greater reliability of profits in this subsector compared with food crops, private sector participation is generally higher. The difficulty, however, is ensuring that smallholders benefit as much as commercial farmers do from private sector intervention. Beyond ensuring a favorable investment climate in terms of both infrastructure and policies, governments could also encourage private sector intervention in areas that would create spillovers advantageous for smallholders. This includes agricultural R&D, innovative technologies for reducing information asymmetries, and financing arrangements that improve credit availability.

In this subsector, determining where synergies exist between the private and public sectors is crucial, but governments will remain primarily responsible for ensuring that smallholders, particularly the poorest among them, are not left behind (see section 5). Politically, this may prove more important in those countries where key export commodities are produced by smallholders, such as cocoa in Ghana or groundnuts in Senegal, than where traditional crops have been the preserve of commercial farmers, such as tobacco in Malawi.

Nontraditional Export Crop Sector

Increased demand from European consumers combined with the growth of supermarkets in Africa as well as the emphasis by donors and governments alike on agricultural diversification, has led to a surge in nontraditional exports, particularly horticulture. For example, as of 2000, horticulture in the form of specialty vegetables and roses accounted for 38 percent of Zambia's agricultural exports, and export earnings in this sector increased from US\$6 million to US\$33 million between 1994 and 2001 (World Bank 2004). In Kenya, fresh fruits and vegetables had a rural market value of US\$354 million as of 2002, equivalent to 3 percent of GDP, and has become the fastest-growing sector of the economy (Neven and Reardon 2004; Smith et al. 2004).

The literature on the political economy of agriculture policy in Africa in the pre-structural adjustment era did not address the role of the state in this subsector. This is probably because the growth in high-value, nontraditional exports is a fairly recent phenomenon, even though a number of

African countries, such as Kenya and South Africa, have been engaged in this subsector for decades. Moreover, this subsector is marked by a higher degree of private sector involvement, and therefore, much of the literature on this subsector focuses on whether and how the private sector facilitates smallholder participation rather than on public sector intervention.

A majority of discussion about this subsector revolves around supermarket value chains and their implications for smallholder production. The findings are relatively mixed. While British and other EU supermarkets may be increasingly sourcing from large commercial farms in Africa (Dolan and Humphrey 2001), some domestic retailers in the region appear willing to buy from smallholders who can meet certain quality, safety, consistency, and cost standards (Weatherspoon and Reardon 2003).

There is a variety of institutional options by which smallholders can overcome the market failures that they typically face and increase their competitiveness in the high-value and nontraditional products. They include the formation of producer organizations and cooperatives on the one hand and vertical integration in the form of contracting arrangements on the other. In the horticulture industry, contracting arrangements in the form of outgrower schemes play an important role. In principle, firms provide farmers with credit, inputs, machinery, extension services, and an assured output market, while farmers offer a steady flow of raw materials, which is crucial for processing firms that may have high fixed costs (Glover 1984). In addition, by not entering into a direct wage relationship with the farmer, but rather agreeing to buy her crops, the firm does not need to worry about fluctuations in labor supply and avoids the transaction costs of supervising agricultural labor (see section 2). Since the firms control the technical inputs they offer, they also indirectly control the quality of the crops produced (Bracking 2003). Moreover, the firms can provide the necessary managerial oversight and technical advice needed for ensuring that the products meet the requisite standards demanded by the final market.

In practice, however, outgrower schemes have demonstrated variable success. There is evidence of smallholders selling to alternative traders, which in turn reduces firms' recovery rate of input costs and diminishes trust between the firm and the farmer. Such a trend has also encouraged some companies to stifle the dissemination of processing facilities to local traders and thereby reduce the latter's incentives to buy from smallholders involved in outgrower schemes (Shepard and Farolfi 1999). Depending on the terms of the outgrower contract, smallholders can also be at a disadvantage. Often, the contract is binding on the farmer, but the firm can renege at will by claiming the provided output does not meet specified quality standards (Bracking 2003; Glover 1984). Indeed, depending on the design of the scheme, firms can reinforce smallholder dependence and vulnerability.

Cooperatives and farmer associations represent another approach for helping smallholders take advantage of the opportunities in the high-value export sector. They are an institutional arrangement built around the principles of democratic grassroots participation. In Europe, cooperatives have played an important role in integrating small farmers in high-value markets, and they have remained important until today.⁹ However, in developing countries, the public sector undermined the participatory nature of these organizations by intervening excessively during the preadjustment period, believing that the groups were too politically powerful, without providing the necessary managerial assistance and training necessary for them to thrive (Lele and Christiansen 1989). In the post-structural adjustment period, some former parastatals have been transformed into cooperatives, while others have emerged with the support of donors and NGOs. Lessons from successful cooperatives highlight the importance of limiting membership to a small group of individuals who already have established some trust and familiarity, strong democratic processes, and a sustainable source of financing. Yet development projects centered on creating cooperatives and farmer organizations have often failed if the incentives for farmers to join were only input subsidies, which did not foster trust among participants but rather increased farmers' dependence on the project organizers (Coulter et al. 1999). The trend in many African countries toward greater

⁹ For example, cooperatives account for more than 80 percent of the market share of dairy in several European countries (van Bakkum and van Dijk 1997).

decentralization and participatory politics promises to offer at least the necessary supporting environment for cooperatives and producer associations.

Beyond the desirability of institutions for promoting smallholder participation in high-value export crops, a number of other ethical questions pertain specifically to this subsector. One issue that has received particular attention by the research community in recent years is the role of women in Africa's horticultural industry (Barrientos, McClenaghan, and Orton 2001; Barrientos, Dolan, and Tallontire 2003; Dolan and Sorby 2003; Smith et al. 2004). Although women comprise between 35 and 75 percent of the workforce in export horticulture (Smith et al. 2004), they disproportionately suffer from discrimination in hiring practices, low wages, sexual harassment, and unsanitary working conditions.

Does the state have a role to play in this subsector? Answering this question highlights a number of challenges for the state. First, there may be a degree of power asymmetry between the state and the other actors involved, including not only the private sector but also NGOs and the donor community. Indeed, outgrower schemes emerged in response to poor public extension systems and inadequate credit. They enable the state to benefit from foreign investment, increased export earnings, greater tax revenue, and savings on hiring extension personnel and providing inputs (Bracking 2003). Therefore, these aggregate benefits will influence the political considerations regarding the extent to which governments ensure that outgrower schemes assist smallholders. Second, these schemes may benefit from reliable access to the legal system for enforcement. Yet, as demonstrated in Zambia, where a law was passed to increase firms' recovery rates by discouraging smallholders from selling to other traders, the lack of bureaucratic capacity to enforce legislation reduces its utility (Shepard and Farolfi 1999).

This last point also applies to legislation regarding labor standards and ethical processes in the horticulture industry. Governments can approve and enforce International Labor Organization conventions, enforce occupational health and safety legislation, and help exporters meet the criteria of international labor codes (Smith et al. 2004). The horticulture industry may, however, lobby against such measures. On the other hand, consumer concerns in import countries may promote the implementation of such standards. There is a trend toward private standards, such as EUROPEGAP (Good Agricultural Practices), which are higher than national regulations and address labor rights as well as environmental issues. Private standards usually rely on third-party certification, which is, however, a poorly regulated area (Busch 2004). This indicates that the public sector may have to play a role in this area, too.

Summary

Dividing the problems facing smallholders into three subsectors may be overly simplistic, especially since some smallholders are involved in multiple forms of production and since, to varying degrees, many of their basic constraints are similar. Nevertheless, there is a strong overlap among the nature of production for certain commodities, the socioeconomic status of the smallholder involved in that commodity, and the interests of the state. This, in turn, has implications for both the type of public sector intervention that is necessary and that which is feasible.

The food crop sector tends disproportionately to include the poorest and most remote smallholders who have lost access to crucial inputs during the process of market liberalization. Without private sector interest, the government must find a way to improve access to inputs in a manner that is consistent with macroeconomic stability and that avoids the problems of corruption and predation that have historically characterized state intervention. If input subsidies are provided, they need to be accompanied by a clear exit strategy that accounts for the political environment and competing interest group pressures.

For traditional export crops, which still comprise the majority of agricultural exports in a number of African countries, world price volatility remains a major concern. Since this will be a problem for the foreseeable future, is continued government price support the appropriate tactic? Or

is privatization of government marketing boards a more viable solution to increase public-private synergies and possibly encourage greater diversification away from these crops? Not surprisingly, the needed degree of continued government intervention will most likely depend on the capacity of the public and private sectors, the socioeconomic status of the producers involved in exporting traditional crops, and the importance of the crop to the overall economy.

Lastly, the nontraditional export sector has witnessed a high degree of private sector involvement and government encouragement. With the growth of supermarkets and the implementation of more stringent quality standards, the long-term status of smallholders in this subsector remains ambiguous. A number of institutional options, such as farmer-controlled enterprises and private outgrower schemes, have emerged to encourage smallholder participation, but government regulation is still needed to ensure they function properly and do not reinforce patterns of dependency among smallholders. Whether the government is willing and able to legislate and effectively implement regulation in this regard has yet to be proven in any conclusive manner.

5. Approaches for Future Research

The preceding sections suggest that there are two major areas where research can contribute to meet the challenges involved in understanding policies and politics for smallholder agriculture. One area is normative policy analysis, which focuses on the role of the public sector, the private sector, and the third sector in overcoming the different types of market failures that are an obstacle to small farm-led agricultural development. The second area is positive policy analysis, which aims at a better understanding of political processes, taking the change in political frame conditions into account. This analysis is essential for assessing the political feasibility of policies supporting pro-poor agricultural development. This section discusses approaches for future research in these two fields.

Understanding the Role of the Public Sector, the Private Sector, and the Third Sector

As the considerations presented in section 2 show, the types of market failures that require policy interventions differ depending on the country- and commodity-specific conditions, and they change in the course of development. Therefore, the first analytical task is to identify to what extent a rationale and justification for intervention exists. If the answer to this question is positive, the second analytical task is to identify the appropriate policy instruments for the intervention.

Analytical Tasks

1. *Identifying the need for policy intervention:* A major problem with the analysis of agricultural policies of the 1980s, especially in the study by Krueger, Schiff, and Valdés (1991), was the assumption that a situation without policy intervention would be the appropriate reference situation. Standard procedure in neoclassical economics assumes that nonintervention is the optimal reference situation and that market failures do not play an important role.¹⁰ Since then, the analytical possibilities to identify whether there is an economic need for interventions have increased considerably due to a better understanding of how the specific material conditions of agriculture influence agrarian institutions; the improved possibilities to use modeling techniques for analysis; and the opportunity to learn from the consequences of the structural adjustment reforms (see section 4). However, beyond the need of

¹⁰ Even though one can attribute a neoliberal ideological bias to this assumption, it is not a surprising assumption to be made at that time. Alexander Chayanov (1966/1925) had, in the 1920s, already analyzed the specificities of agricultural production and its institutional consequences in a framework that is compatible with neoclassical economics. This work was translated into English in the 1960s, but it did not receive major attention in the neoclassical literature. It was mainly the application of the concepts of new institutional economics to agriculture, which increased the understanding of the market failures discussed in section 2. Though in 1937, Ronald Coase wrote the first paper on the role of transaction costs (using a different term) in economic organization, agricultural economists applied these concepts only decades later. The various papers by Binswanger et al. quoted in section 2 on the role of market failures caused by the specific material conditions in agriculture did not appear before the middle of the 1980s. Bardhan's (1989) seminal book on agrarian institutions was published at the end of the 1980s.

addressing market failures, the decision on the scope of functions that the state should be responsible depends on value judgments and state capacity.

2. *Identifying appropriate policy instruments:* It remains a major analytical challenge to identify appropriate policy instruments that address market failures in agriculture. The experience of the pre-adjustment era shows that policy interventions can have various unintended consequences. They are inherently prone to capture by interest groups, so avoiding policy and government failure is important. The responsibility for correcting market failures ultimately rests with the state, but this does not imply that public sector institutions alone should necessarily provide all respective public goods and services. There are various options to involve the private and the third sector, including partnership arrangements, contracting, and regulation. If one distinguishes between the provision and the financing of services, it becomes clear that there is a wide range of alternative institutional options. This is illustrated in Table 1, which takes extension services as an example.

Table 1. Governance Structures for Providing and Financing Agricultural Services: The Example of Agricultural Extension^a

Provision of the Service	Financing of the Service				
	Public Sector	Private Sector: Farmers	Private Sector: Companies	Third Sector: NGOs	Third Sector: Farmer-Based Organizations (FBOs)
Public Sector	Traditional public extension	Fee-for-service extension	Private or third sector contracting extension agents from public sector		
Private Sector: Companies	Publicly financed contracts or subsidies to service providers from private or third sector	Information provided with sale of inputs	Advertisement in newspapers, radio, and TV	Extension agents from private company hired by NGOs	FBO contracting extension agent from company
Third Sector: NGOs		Extension agents hired by NGO; farmers pay fees		Extension agents hired by NGO; service provided free of charge	
Third Sector: FBOs		Extension agents hired by FBO; farmers pay fees		NGO financing extension agents who are employed by FBO	Extension agents hired by FBO; service free to members

Source: Adapted from Rivera (1996) and Anderson and Feder (2004, p. 44).

^a The extension reforms of the previous decade have indeed led to a wide variety of institutional arrangements (see Rivera and Alex [2005] for a review of extension reform in more than 30 countries).

These considerations lead to the question of which combination of public, private, and third sector involvement is most appropriate in a given situation. To the extent that the public sector is involved, the question arises as to how centralized or decentralized the public sector involvement should be. Applying the concepts of new institutional economics to the public sector is a promising analytical approach in this field (compare Birner and Wittmer 2004). This approach underscores that there are no universal answers to the question regarding the role of the public, the private, and the third sector. It is essential to identify the nature of the goods and services to be provided (public goods, private goods, common-pool resources, club goods), to analyze the specific attributes of the transactions required, to assess the capacity and the incentive structures of the potential parties involved (government agencies, private sector companies, NGOs, farmers associations), and to examine contextual factors such as the institutional environment. This approach makes it possible to derive testable hypotheses on the context-specific comparative advantage of different governance structures in the area under consideration, but empirical measurements of transaction costs are required to test such hypotheses. Recent studies show that it is possible to empirically measure transaction costs facing state agencies, NGOs, and farmers groups in different governance structures (see Gabre-Madhin 1999; Mann 2000; Mburu and Birner 2002).

Challenges to Analyzing Policy Intervention

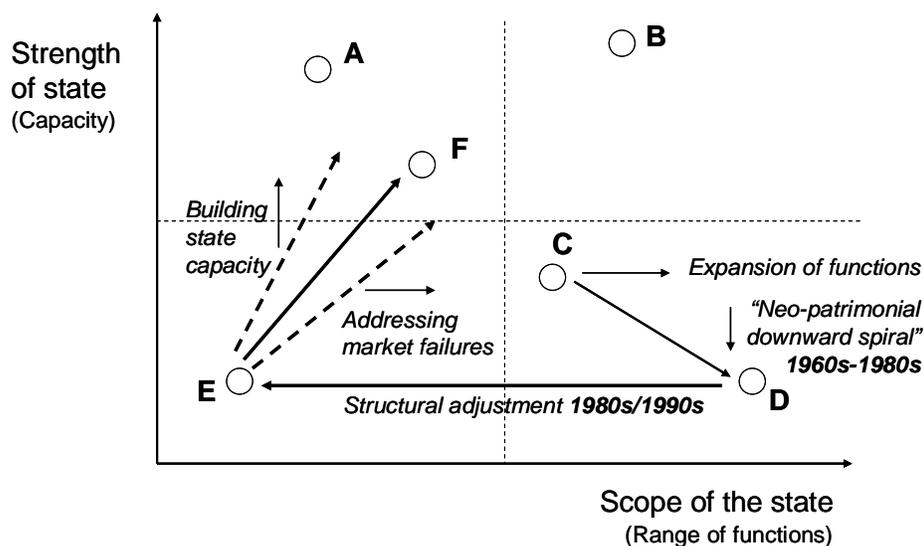
1. *The problem of state capacity:* The analytical approach suggested above echoes the recommendation of the 1997 World Development Report that it is essential to match the scope of government policies to existing state capacity. A major problem rests, however, with the limited capacity of the state, especially in many African countries. As Levy (2004) observed, even though many African governments inherited a fairly effective public administration established during colonial rule and invested in capacity building in the early years of independence, state institutions have subsequently become subject to a “neopatrimonial downward spiral.”¹¹ Democratic reforms and donor assistance did not prevent this downward spiral; they may have even contributed to this problem (see van de Walle 2001, quoted in section 3).

The recommendation to match state functions with state capacity corresponds to Fukuyama’s (2004) emphasis on distinguishing between the strength and the scope of the state. A “strong state” is characterized by well-managed institutions, which are effectively controlled by checks and balances and which have the capacity “to plan and execute policies and to enforce laws cleanly and transparently” (p. 7). While a strong state, defined in this sense, is in any case preferable to a weak state, the range of functions that the state should be responsible for is a matter of value judgment. Countries may prefer a state with a limited scope of functions, as indicated in point A in Figure 2, or they may prefer a more active state with a broader scope of functions, for example, in the field of social and environmental protection, as indicated in point B.

The “neopatrimonial downward spiral,” combined with an increase of state involvement in the economy, can be characterized by the shift from point C to D. The structural adjustment programs of the 1980s reduced the range of functions of the public sector, which is indicated by the move to point E, but they did not contribute to increasing the strength of state institutions. Obviously, countries now face difficult choices regarding the extent to which resources should be spent to (a) increase the provision of public services and infrastructure that are essential for pro-poor growth (moving to the right side in Figure 3) and (b) build state capacity to improve the effectiveness and efficiency of this provision (moving upward). The sequencing of these policy changes may matter as well (Fukuyama 2004; Levy 2004).

¹¹ Interpreting the deterioration of state capacity in Africa, one has to take into account that the state institutions implemented by the colonial regimes were “transplanted” and may have undermined indigenous institutions (see Dia 1996).

Figure 2. Distinguishing Strength and Scope of the State



Source: Adapted from Fukuyama (2004, pp. 11, 13, 14).

These considerations are relevant with regard to policies for smallholder agriculture, because a lack of state capacity constitutes a major problem in those areas where the incentives for the private sector are weak and thus where it is not sufficient to create an enabling environment. In line with the considerations presented in section 2, this is most likely to be the case for food staple crops in phase 1 and phase 2. The experience of the Green Revolution in India highlighted that state provision of key services—including R&D, extension, improved seeds, fertilizer, credit, and storage and marketing—is important to “establish the basics” and “kick-start” food crop markets (Asian Development Bank 2000). Even if the state contracts out the provision of such services, the need for the state to effectively administer such contracts remains. Likewise, if the funding of such interventions is financed by donors and if NGOs are involved, state capacity is still required for coordination and for providing oversight. In spite of their nonprofit orientation, NGOs are not free from problems of rent-seeking and capture, especially under the influence of expansive donor funding.

Land reform is another policy field that requires public sector capacity. Even market-assisted land reform depends on an effective land administration. With regard to the high-value and nontraditional crops, state capacity is also required for the various reasons discussed in section 4, such as enforcement of contracts and implementation of social and environmental standards. State capacity is also necessary to better cope with food crises and to implement social safety nets. Moreover, as discussed in section 2, smallholder development depends on the provision of public goods in sectors other than the agricultural sector itself, such as roads, infrastructure, and education. Hence, improving state capacity, especially in Africa, remains an essential task to implement policies that support smallholder agriculture.

Research can contribute to this task by analyzing the possibilities and experience of public sector management reform. There is meanwhile ample experience with reforms in Africa that aim to build state capacity and improve public sector governance (see Levy and Kpundeh 2004). However, researchers have paid little attention, so far, to the specific challenges of reforming the agricultural administration. Research focuses mainly on reform efforts of specific agricultural services, such as agricultural extension or irrigation, but largely ignores placing these reforms in the context of the general public administration and public sector management of which they are part. This limited perspective has been a major obstacle to the reform of agricultural sector institutions (Binswanger 2004).

The insights from projects that aimed at building state capacity in Africa reveal some important insights for future research in this field (see Levy and Kpundeh 2004). One finding is the need to take the political dimension of policy reform and reform implementation into account in order to match the scope of reform with political commitment and the institutional capacity for managing reforms. Identifying a “good fit” proved to be more successful than a “best practice” approach. (compare with above). Another insight, especially from efforts to implement new public management approaches, is that economic incentives alone are not sufficient to create a noncorrupt, efficient, responsive public service. Issues of leadership, organizational culture, and professional ethics can play an important role as well. Decentralization is another major research area in the context of state capacity. By creating voice and accountability, decentralization has the potential to improve the responsiveness of public policies to the needs of smallholders. However, decentralization can also lead to elite capture, especially in cases where social hierarchies prevail (see Bardhan [2002] for a review).

As this account shows, research progress regarding the role of the public, the private, and the third sector in policies for smallholder agriculture would certainly benefit from interdisciplinary cooperation among agricultural economists, political scientists, public administration specialists, and rural sociologists.

2. Problems of ideological bias: A major shortcoming of research, as well as of policy intervention, with regard to the role of the public, the private, and the third sector can be seen in different forms of ideological bias. One bias is the emphasis on the private sector that has occurred since the 1980s, coupled with a general distrust of public sector involvement.¹² In view of the above considerations, this is rather problematic for the prospects of smallholder-based agricultural development. As Robert Paarlberg noted, if M.S. Swaminathan would propose the policy package that made the Green Revolution in India possible to the World Bank today, it would never been accepted due its public sector focus (Paarlberg 2005). Research is not free from private sector bias either. For example, there is an emphasis on analyzing contract farming and a relative neglect of institutional alternatives that focus on collective action among farmers, such as cooperatives. This is problematic because institutional options focusing on collective action may be one way to support smallholders by overcoming market failure and avoiding state failure, as the example of the Grameen Bank shows. This example also shows that challenging conventional wisdom can be important to make policies for smallholders work. The founder of the Grameen Bank explicitly challenged the conventional wisdom that sustainable credit systems without collateral are impossible (Yunus 2003). While institutional options based on collective action among smallholders, as a third sector option, are an important alternative to pure public or private sector solutions, “community failure” may occur as well (Birner and Gunaweera 2002). This underscores the need for a comparative analysis of different types of institutions in order to identify the best fit depending on the specific circumstances.

A related problem is a bias toward “one size fits all” solutions. A striking example of this bias regarding agricultural institutions is the Training and Visit System of agricultural extension, which was uniformly promoted in more than 70 countries (Anderson and Feder 2004). The failure of this system to achieve impact and sustainability in the long run also underlines the need for research on context-specific institutional arrangements that aim at identifying “best fit” solutions.

Understanding Political Processes

As can be derived from section 4, there is a strong ad hoc element in past explanations of agricultural policies in developing countries. Ex post, it is almost always possible to find a convincing explanation why a particular policy was implemented in a particular country. One can resort to any of the explanatory elements presented in section 3: interaction between different interest groups, motives of

¹² Several related factors contributed to this “power shift” (Mathews 1997), including the change in economic thinking during the Reagan-Thatcher era, the breakdown of the communist regimes, and the effects of globalization.

the political leaders, goal to correct unintended consequences of past policy choices, macroeconomic imperatives, ideology, interests of bureaucrats, food crises, ethnic considerations, and so forth.

Quantitative Analyses

Quantitative cross-country analyses may be useful to enhance the understanding of agricultural policy choices, since they make it possible to test the significance of different explanatory factors that are highlighted in the qualitative literature. Quantitative time-series and cross-country studies could be informed by qualitative case studies along the lines outlined below. For example, Swinnen, Banerjee, and de Gorter (2001) found that periods of protection for Belgian farmers over the past century often coincided with low world prices for agricultural commodities. Protection was greater if a commodity contributed a greater share to national gross national product but lower if a commodity comprised a large share of consumer expenditures, which in turn would lead to high resistance to protection policies among consumers. An increase in agricultural protection was also correlated with the introduction of democratic reforms, which gave farmers a greater voice in influencing agricultural policies. Focusing on developing countries, Fan and Rao (2003) analyzed the factors influencing the budget share for agriculture, using a cross-country regression with a dummy variable for structural adjustment and lagged total government expenditure and per capita GDP as explanatory variables. This study showed that structural adjustment policies were associated with a decline in spending on agriculture in Africa, but not in Asia and Latin America. This implies a larger role of donor influence on agricultural policies in Africa than in the other regions. The approaches used in both studies could be expanded to include factors that capture the capacity of agricultural interest groups to influence decision making. Indicators for such factors may include the presence of farmers' organizations, the degree of urbanization, and the weight of rural votes in the respective electoral system. Apart from regression analyses using the taxation of agriculture or budget shares for agriculture as dependent variables, one could also use event history analysis methods to explain the adoption of agricultural policies that specifically support smallholder agriculture (compare Leicht and Jenkins 1998). Ultimately, such quantitative cross-country studies will depend on a more coherent theory that allows one to derive empirically testable hypotheses about the political feasibility of policies for smallholder agriculture. Case studies that use a coherent analytical framework, as suggested in the following section, will also be useful to inform both development theory and quantitative empirical analyses.

Analytical Framework for Case Studies

This section proposes four building blocks for an analytical framework that attempts to address the challenges of explaining agricultural policy choices. It is argued that the framework should account for the following: the role of ideas, ideology, and policy beliefs; political strategies that interest groups can use to promote their material interests and/or their policy beliefs; the political process in terms of both decision making and policy implementation; and the importance of timing in policy reform.

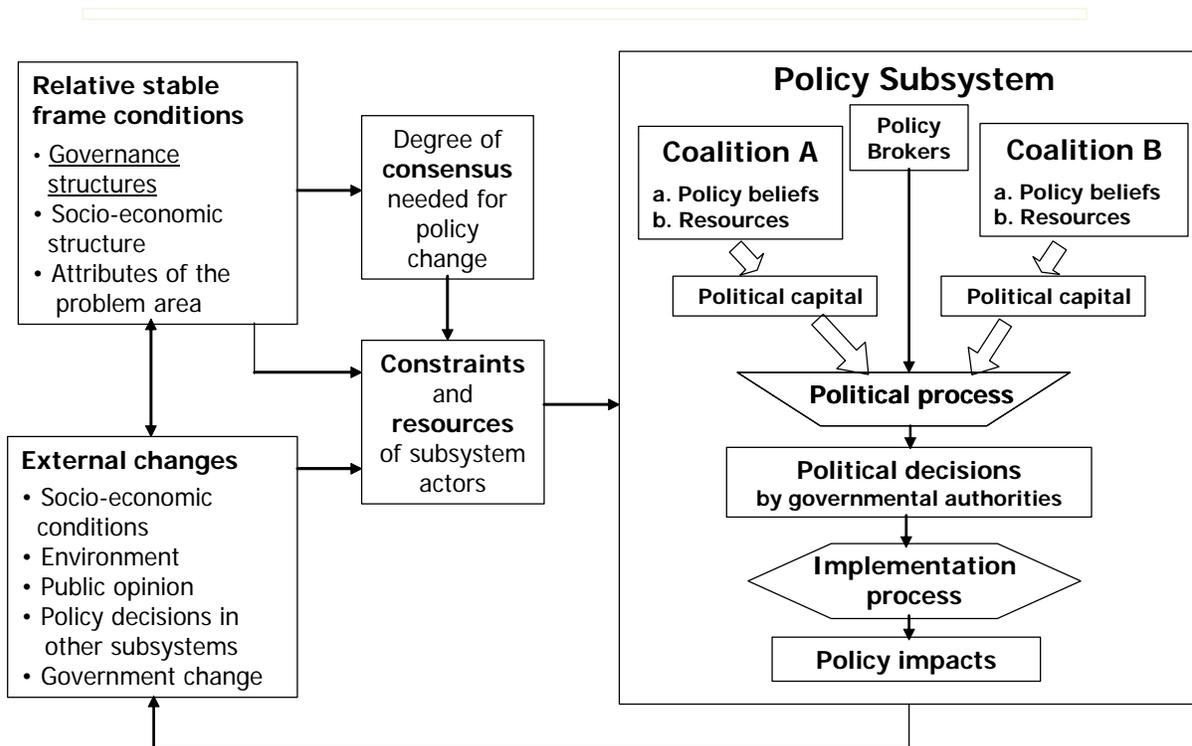
Although it has thus far been mainly used to explain environmental policies, the advocacy coalition framework (ACF) developed by Paul Sabatier and Hank Jenkins-Smith (1993) is highly useful for understanding the role played by ideas and policy beliefs. Specifically, ACF highlights that coalitions that promote the same policy option may not only include representatives of groups representing economic interests, such as agricultural producer groups, but also members of the bureaucracy, NGOs and donors, and think tanks and academia. The number of advocacy coalitions that emerges depends on the policy area; one typically can observe the formation of coalitions around two or three competing policy options. Figure 3 depicts a modified version of the ACF.

To understand the role of different advocacy coalitions in the policy process, one needs to analyze their beliefs and their resources. Sabatier and Jenkins-Smith (1999) distinguished three types of beliefs: core beliefs, policy beliefs, and secondary beliefs. Core beliefs relate to fundamental values, such as the relevance an actor attaches to equity as compared with other goals. Like religious beliefs, these core beliefs rarely change. Policy beliefs refer to the policy solutions that actors consider appropriate to reach their objectives. Important policy beliefs with regard to agricultural

policies refer to whether agriculture plays an important role for economic development (“agro-optimism”) or whether this position is criticized (“agro-skepticism”). Policy beliefs can also refer to more general questions discussed above, such as the role that is attributed to the public versus the private sector. Secondary beliefs refer to the way in which a particular policy is implemented, and they are more likely to change than will core or policy beliefs. Sabatier and Jenkins-Smith (1993) developed empirical methods to measure the policy beliefs and derived empirically testable hypotheses on the conditions under which consensus across advocacy coalitions is more likely to occur.

The possibilities of different advocacy coalitions to influence political decisions and their implementation depend on the resources they have at their disposal, such as financial resources (economic capital), skills and knowledge (human capital), and social networks (social capital). What is essential for influencing policies is the comparative ability of the advocacy coalitions to mobilize these types of capital in order to create “political capital,” which can be defined as the resources that an actor can use to realize outcomes that are in his or her perceived interest (Birner and Wittmer 2003).

Figure 3. Conceptual Framework for Analyzing Agricultural Policy Processes



Source: Adapted from Sabatier and Jenkins-Smith (1999) and Birner and Wittmer (2003).

Strategies to create political capital may include electoral leverage, lobbying, public protest, use of ideological arguments in the public discourse, and securing support from international actors. Actors can also use scientific evidence to create political capital in the policy process. This concept of political capital draws on different political resource theories in economics and political science, including the work by Ilchman and Uphoff (1998), and on resource mobilization theory. The concept makes it possible to better understand the different strategies that advocacy groups can use to promote outcomes that are in favor of or against policies that support small farm development. It can be applied both to the politics of decision making and to the politics of implementation (compare

Thomas and Grindle 1990). The concept of political capital has been applied in quantitative cross-country studies that explain policy choices (e.g., Leicht and Jenkins 1998), though not yet regarding agricultural policies.

Analyzing the nature of the political process by which different advocacy coalitions interact is an important aspect of research on policy processes. As indicated above, one can observe increasing efforts, often promoted by donor organizations, to “open” the political process for public participation, for example, in the form of multi-stakeholder consultations. The model of deliberative democracy captures this trend. This model assumes that people may change their perceptions as the consequence of social interaction and that they may come to accept reasons for collective action, even though the outcome is not strictly in their personal best interest (Fung and Wright 2001). Phrased differently, this approach acknowledges that people may change their preferences in a process of social learning. It remains a question for empirical research to which extent stakeholder consultations and other platforms correspond to the deliberative democracy model and promote policy learning across advocacy coalitions (changes of policy beliefs) and to which extent self-interested strategic bargaining prevails.

As indicated in Figure 3, the process of policymaking and implementation depends on frame conditions, which are relatively stable, and on driving forces. The frame conditions include (a) the political and administrative institutions; (b) the socioeconomic structure, which influences the interest groups and the resources they have; and (c) the attributes of the problem area. An important aspect of the political system is the degree to which consensus is required to achieve policy outcomes. One can assume that this degree is lowest in authoritarian regimes and highest in democracies with proportional systems of representation. A problem for empirical research in authoritarian systems is that political bargaining processes typically take place within closed circles and cannot be observed by researchers.

The driving forces of change may include changes in the socioeconomic or natural conditions, including disasters or food crises, which may create pressures that can trigger policy change. Other driving forces include changes in the public opinion (e.g., the emergence of an environmental movement), policy decisions in other policy subsystems (e.g., a change in economic policy that affects agricultural policies), and political changes, such as a change of government following an election or a coup. As indicated in Figure 3, these changes can influence policy processes by altering both the frame conditions and the constraints, resources, and beliefs of the actors.

Kingdon's (1984) approach to identify “windows of opportunity” can be applied to better understand the timing of policy changes. This is important because some policy changes crucially depend on timing. The most obvious case is land reform, which has been most successful if a window of opportunity arises after a major regime change could be used. Kingdon's (1984) approach is based on a criticism of the conventional policy cycle model, which assumes that policies are brought on the political agenda, adopted, implemented, and evaluated in a systematic way. The argument is that for analytical purposes, it is useful to distinguish three different “streams”: a problem stream, a policy stream, and a politics stream. In the policy stream, policy solutions are constantly generated by research institutions, think tanks, and government agencies, but they are not necessarily implemented, and to some extent they end up in the “garbage can” without being adopted. The problem stream describes the problems in the respective policy subsystem, which may increase or decrease over time. Shocks, such as natural disasters, may occur and lead to sudden policy pressure. The politics stream captures the ongoing changes in the political system. Windows of opportunity for policy changes arise, if these streams can be “coupled.” This is typically the case if either the problem pressure or changes in the political system, such as elections, create an opportunity for change, and if political entrepreneurs can make use of this situation to promote the adoption and implementation of policy options, which may have been in the policy stream for quite some time. The political entrepreneurs may be members of the advocacy coalitions or policy brokers who can mediate between coalitions. Obviously, for research institutions, which contribute to the production of policy solutions in the policy stream, a better understanding of the windows of opportunity for policy adoption is helpful.

6. Concluding Remarks

The 20th century has generated a rich and diverse experience regarding the role of small farms for poverty reduction and economic development. The experience has shown that policies that support small farmers by correcting for the market failures inherent in the different phases of agricultural development can be a particularly successful strategy to achieve pro-poor growth. Yet the empirical evidence also shows it is politically difficult to implement such policies and avoid the government failures that are likely to occur in this field. Although there is no shortage of possible explanations why countries failed to design and implement policies that would make pro-poor agricultural growth possible, the reasons that some countries have been successful in this regard are less well understood. As the paper highlights, analyses of agricultural policies and processes in the postliberalization era that account for contemporary political contexts are virtually nonexistent. At the same time, however, there have been considerable advances in analytical techniques, which may help address important knowledge gaps, such as: Depending on the country-specific and sector-specific frame conditions, what is the appropriate role of the public sector, the private sector, and the third sector in addressing the market failures that occur in different phases of development? How can the state capacity, especially in Africa, be increased to better perform the functions that remain the responsibility of the public sector? Which types of policy reforms are politically feasible?

As past experience shows, progress in this field depends on the courage to challenge conventional wisdom and efforts to apply new analytical methods. The paper also suggests that interdisciplinary research projects, which bring agricultural economists, political scientists, rural sociologists, and public administration specialists together, would be fruitful to bridge the remaining knowledge gaps. Combining research approaches from different disciplines has never been easy. However, considering that more than 90 percent of the world's 1.1 billion poor are small family farms (Lipton 2005), continuing efforts to better understand the policies and politics for smallholder agriculture are more than justified.

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Discussant Remarks

Nicolas van de Walle, Professor of International Studies, Professor of Government, and Director, Mario Einaudi Center for International Studies, Department of Government, Cornell University, USA

I've learned a lot about agriculture in the past 48 hours. I thought these were very interesting papers. In a way, it was unfair to ask the writers to talk about both policy and politics—essential, but unfair, because it just makes the topic even more complex than talking about either policies or politics separately. I will actually have very little to say about policy, because my sense is that there is a huge consensus in the room on policy. The devil's in the details, but there is a lot of consensus about the general direction policy should take.

If I understand correctly, the central point that Birner and Resnick makes, and which I think has been made again and again, is that market failures are pervasive in this small older sector. And yet the potential for growth and for poverty alleviation is huge. Therefore, public intervention is justified. I accept that consensus, and I don't know what else to say about it. But let me say three things about the relationship between policy and politics.

The first is that the real dilemma, which I think we all know, is that government failures have been almost as pervasive as market failures in these countries. Therefore, even if we think that public intervention is justified, we're still grappling with figuring out how to do effective public intervention.

My second general comment is that the relationship between policies and politics is different in low-income countries than in the industrialized countries. I'm going to use *low-income* and *Africa* synonymously, as I think everything I say is based on my experience in Africa but is applicable to low-income countries outside of Africa. Birner and Resnick, and their paper citing Meredith Grindle, point out that in these low-income countries, there's different politics before and during implementation. That is to say that in the west the sometimes quite contentious participatory politics around policies typically takes place before implementation when the policies are debated and getting decided. Then policies get decided, and there's relatively little leakage or contention during policy implementation.

In low-income countries, it's typically the other way around. There's very little participation before policies are decided for a variety of reasons that we could go into. And then the real participatory politics that shapes the actual policies, the effective policies, takes place during implementation. In effect, participatory politics can alter the actual policies in the manner in which they are implemented.

I think this is key to understanding what happened in Africa in the 1960s and 1970s in particular. What's really striking about Africa to me is not so much that there were these urban bias policies, because, in general, urban bias was a doctrine accepted by governments and donors all over the world. What really differentiates the Ghanas and the Ivory Coasts from the Koreas and Taiwans was not the policy on paper, but how it was implemented. I would argue that, in general, the extraction of resources out of agriculture to finance modernization existed everywhere. What distinguishes Africa much more than the level of taxation is the ineffectiveness of policies designed to modernize agriculture.

As a result, the extraction from agriculture didn't lead to the modernization of agriculture or even the development of, for example, rural infrastructure as it did in parts of currently middle income Asia. Implementation in these low-income countries has been inherently problematic.

My third general comment about the relationship between politics and policies focuses on state capacity. State capacity condition how policies are implemented and really limits the kind of policies that can effectively be implemented.

I think Birner and Resnick have it exactly right. It seems to me that what we fail to understand properly is the extent to which state capacity is endogenous to the history and politics of a country.

The aid industry has typically treated state capacity as exogenous. It's sort of like rainfall. These countries have low rainfall; they need irrigation. They have low state capacity; they need state capacity training and development efforts. The best sign that capacity is in fact entirely endogenous is that we've had virtually no increase in state capacity in many of these countries, despite the fact that we've gone from a handful of college graduates at independence to now tens of thousands of college graduates, and yet, state capacity has increased very little.

Now I'm going to talk more specifically about policies and focus on where we are on agricultural policies, which both papers address. In particular, Birner and Resnick do an excellent job of laying out the different issues of where policies come from.

I basically agree with their argument, but I would make a slight change of emphasis, and to downplay the role of interest groups. If you think of the revised hypothesis, you would expect Africa to have the least urban models bias, because clearly interest groups in Africa are absolutely the weakest of any region in the world. Because of state repression, because of the structure of these economies, and for other reasons, you'd be hard-pressed to find some kind of organized pressure group that actually has had real effect on policies. I recognize the premises of urban bias, but I don't think they explain policy nearly as well as the other factors that Birner and Resnick point to—in particular the role of aid and of the donors, as well as the role of ideology.

I would emphasize that a third factor that I think they under-emphasize. I agree very much about the role of the donors and the role of ideology. Let me focus simply on the interests of the state and the state elite. I think it's a misconception to view the African state as a patronage state. There is systematic recourse to clientelism but it is not patronage. I think we can understand that if we just look at the size of the African state. It's sort of a stylized fact that in the West, the state represents 35 to 50 percent of gross domestic product (GDP) in terms of government consumption. In Latin America, certainly before structural adjustment, we're talking about states that were in a 30 percent of GDP range.

On the other hand, the African states typically are well under 20 percent of GDP, and a number of African states are around 10 percent. Those states simply have lacked the fiscal resources to build up large amounts of patronage. In fact, I would argue that it was the attempt by politicians in Africa to build large amounts of patronage within the state in the 1960s that led directly to their bankruptcy. In some countries of West Africa, if you take away nurses and teachers, the entire state apparatus is 15,000 people. It also means that there's very, very little redistribution in Africa compared with middle-income countries, like those in Latin America, and in Africa, very little money is actually getting out into the countryside.

Discussant Remarks

Robert Paarlberg, *Professor of Political Science, Department of Political Science, Wellesley College, USA*

I enjoyed reading both papers. I'll start with Kisamba-Mugerwa's paper, from which I learned a number of important things. I think most interesting was the description of the origins of the Uganda Grain Traders Consortium, which I think is a clear example of a state initiative that reduces transaction costs in the private sector. So while the rest of us are talking about transaction costs, Kisamba-Mugerwa is actually doing something about them.

I found myself in broad support of many of the key points made in the paper. For example, the private sector won't come in to help smallholders until the government provides political stability—this is absolutely essential. Also, significant investments in rural infrastructures, stability, and market liberalization alone don't constitute an enabling environment.

Kisamba-Mugerwa also makes an interesting point from Uganda's perspective on densely settled areas. In these areas, continued rapid population growth does get in the way of small farm efficiency. That's something that many people try to deny. I'd also like to stress cooperatives and his arguments about biotechnology.

Regina Birner and Danielle Resnick seek to provide prescriptions, but they also try to provide a comprehensive and dynamic political economy model of policymaking processes. In doing so, they go significantly beyond the interest-based rational choice models that have been dominant probably since the original Honma and Hayami work of almost 20 years ago, which predicted different levels of border protection for the agricultural sector based on shifts of comparative advantage away from the agricultural sector during the industrialization process.

I like the approach in this paper because it goes beyond equilibrium level of protection in the sector; and maps out policy processes that can generate outcomes for many different kinds of issues. The authors go beyond the vision of politics based on collective actions to advance material interests. They also introduce ideas and political beliefs. So it's a rich and ambitious design. It's not yet operationalized, so in its present form, it's probably best for guiding inquiry and not necessarily for generating predictions or even post-dictions of actual policy outcomes.

But their paper also has a prescriptive dimension, and I'll turn to that now briefly. I think the authors are in strong agreement with Kisamba-Mugerwa's view that small farmers need more proactive public sector support. And I agree wholeheartedly. My only quibble might be that Birner and Resnick go a bit further than I would in calling for market interventions, by including price stabilization interventions, not just input subsidies. And they don't press quite as hard as I might for state investments in public goods and services in the countryside.

In this regard, I suspect Birner and Resnick's preferred composition state spending in support of agriculture might not pass the Alberto Valdés or the Thom Jayne test. However, Birner and Resnick aren't calling for anything that wasn't done by the government of India during the original Green Revolution.

In fact, it has occurred to me that if the government of India were trying to launch its Green Revolution policies today rather than in 1964, and it had come to the World Bank or to USAID today with this menu of policies, the policies that actually worked in 1964 would be turned down flat, because they would be seen as led too much by the public sector. The policies weren't sufficiently market oriented. There were too many subsidies, too many market conventions. It might have been turned down flat.

One of the great virtues of Birner and Resnick's paper is its pragmatic rejection of this ideological vision of promoting market democracy, a vision that currently dominates the foreign systems policies of the U.S. government. As a member of the urban middle class, of course I love the market economy myself. They don't call it bourgeois democracy for nothing: It's most preferred by the urban bourgeoisie. But if I were a poor farmer in the countryside in Africa or anywhere else, there would be a long list of things that I would want from my government before either market liberalization

or democracy. I would want public sector investments in rural schools, rural clinics, rural roads, rural rule of law, and agricultural research and development. These are all needed to increase the productivity of my labor from farming, which in turn will be necessary if I am ever to escape poverty.

Democracy is wonderful, yet one dirty little secret of democracy is that it does not have a particularly strong record when it comes to helping the rural poor. I appreciate Birner and Resnick pointing out, although it's not fashionable to say so, that some of the most pro-poor, most pro-small farmer policy actions ever taken have been by nondemocracies, such as Indonesia and China. The authors could have added to this list the land reform and rural investments and the low exchange rate policies of pre-democratic South Korea and pre-democratic Taiwan. They even could have gone further. While they mention the window of opportunity for land reform after new regimes come to power, they could have pointed out that the new regimes that most clearly seized this opportunity—the new regime in China, the new regime in South Korea, the new regime in Taiwan, you could even add Cuba and Nicaragua—were all nondemocratic new regimes. On the contrary, several of the new democratic regimes in Brazil and the Philippines in the 1980s and in South Africa in the 1990s were ones that conspicuously failed to seize the opportunity for pro poor.

So if you want to be pro poor, especially pro rural poor, it just isn't enough to be pro market and pro democracy. I would define good governance for poor small farmers not in terms of the traits of government, democratic or not, or even the capacity of the government, strong or weak. I would insist that we use the actions of the government as the litmus test. Is the government investing adequate resources in the creation not of public goods and services in general, but of rural public goods and services in particular. Not just roads, but rural roads; not just clinics, rural clinics; not just R&D, but agriculture R&D.

I'll close now with one of my pet peeves. In posing this litmus test on governments, I'm frustrated because I can't find the data. You can't monitor something that you can't measure. You can't promote something that you can't measure. I'm not aware of any comparative data set that breaks out measures of the urban versus rural public sector investments of governments (I'll be delighted to be corrected in this assertion).

The World Bank, with its 800 or so development indicators on the economies of states and also the policies of states, breaks those indicators out in almost every way you could imagine—age, gender, quintile, level of development—except urban versus rural. I suspect the Bank knows how damning these urban versus rural breakouts would be for many of its borrowing countries, and has decided not to go out of its way to reveal these misallocations of public funds away from the rural poor.

Session 7

Summary of the Open Discussion

The dynamic discussion session covered a range of topics, including foreign aid, state capacity, representation, and accountability.

In discussing the role of aid, participants highlighted that the donor community must operate on a “do no harm” principle and must ensure that aid, and the manner in which it is distributed, does not undermine state capacity. One participant mentioned that donor activities actually shorten the time horizon of the governments and increase their patrimonial dimension; for instance, aid, in its current form, has the same effect on Africa as the oil curse had on Venezuela. He proposed a foundation model whereby governments are expected to invest in their own capacity to come up with their own development programs. Another participant brought up the detrimental effect of aid on state capacity, highlighting tension between the objective and the instrument in one speaker’s proposal to launch a Marshall Plan to build up state capacity. He argued that dramatic increases in aid swamp the states’ absorptive capacity, create or further exacerbate salary gaps, and poach the finest local people out of civil service. Therefore, weak administrations are left permanently crippled when the international technical experts depart. Another participant echoed these concerns, citing the levels of brain drain in Africa, which cannot be compensated for by remittances alone. One of the causes for diminishing state capacity, he also noted, is the HIV/AIDS epidemic, which decimates many public institutions. Some skepticism was expressed about the relationship between strengthening state capacity and achieving visible reductions in rural poverty, although one of the speakers, Regina Birner, argued that historical evidence suggests that greater state capacity is associated with higher levels of investment into rural areas.

Governance challenges and problems of accountability were recognized as major obstacles for effective use of aid and implementation of pro-poor policies. A participant mentioned that the medium- or short-term vision of many governments is often at odds with longer-term developmental goals. In particular, the time horizon of civil servants, rather than politicians, needs to be aligned with policy goals. Accordingly, allocation of donor funding on the basis of governments’ performance or to coalitions that promote government accountability was advocated. The example of Brazil trying to form a coalition of South American nation states to have a common vision in their relationship with both the United States and Europe was proposed as one way to resolve some of these issues. One participant also suggested that money that cannot be immediately used by a country should be placed into a regional trust fund from which the countries can later draw on the basis of progress made.

There was broad recognition that the establishment of democratic transparent institutions, including agencies of restraint for the government, will not be possible without an internal push from ground-up lobbying for such changes to take place. Despite one participant’s comment that rather than waiting for the rural poor to speak up, the onus of responsibility should be placed on a political elite that has the moral clarity to speak on behalf of the poor, most participants agreed that lending voice to the poor and organizing and empowering them to participate in political processes is the preferred solution. A stipulation for free farmers’ organizations, built into conditionality of aid packages, was proposed as one way to promote their development. It was also suggested that the UN Food and Agriculture Organization should take the lead in promoting farmer organizations by organizing an international convention around this issue, as International Labour Organization has done with conventions on international labor standards. It was proposed that farmers should build coalitions with other groups that share their interests but that have a greater degree of political clout. Citing recent examples of farmers’ roles in shaping policies, and even election outcomes, in India, China, Mali, and Ethiopia, the discussants spoke of the need to invest in building the capacity of rural poor to participate by investing in education and information systems, including radio communications. Closer examination of military dictatorships, which have played and continue to play a fundamental role in a number of African states, was promoted. Two participants highlighted the need for strong interdisciplinary collaboration, as well as careful assessment of one’s own biases and ideological stands, as critical steps toward devising working policy solutions.

Closing Session: Synthesis Panel

Commentator Remarks

Glyvyns Chinkhuntha, Executive Director, Freedom Gardens, Malawi

What I want to share with you are my own insights and my own views about small farmers and what has transpired here. I would also like to share with you our own concerns as farmers out there and our own appreciations of what you people have done as scientists, as donors, as governments, and so on.

But from the outset, let me also try to say what we are as small-scale farmers. From the proportion that I am presenting, we are definitely a minority. So I thought probably I was only invited to be an observer. So let me take this opportunity to thank the International Food Policy Research Institute for inviting me to come and be present here with you.

Is there a future for small farmers? Yes, there is. Why do I say it? If there is anything under the sun that is in the largest demand, this is food. You may buy a shirt once and use that same shirt several times. You may buy a car once and use the same car several times in your life. You can never buy food and eat the same quantity of food several times in your life. So each time you must eat, you must eat a different quantity, another quantity of food. This ensures the farming community that there is a future.

That problem takes us to the next stage. If food is so valuable, if food is so important, why is it that small-scale farmers haven't gone far enough? If food is so valuable, it means there is a huge market for their products. Why is it that we haven't tapped into it? Why is it that we aren't producing enough? Why is it that we haven't stored enough? The main reason is our situation, the situation from which we are operating. Our resources do not permit us to invest in what we are doing effectively. So there is low investment in the land, low investment in the water, low investment in building our own capacity. In short, we have no investment facility; we have no resources to invest effectively in our own small-scale farming. And a low investment will mean global activity. Low investment in our activity means low output. But the main reason we find ourselves in that situation, the underlying main reason, is low adoption of information, low adoption of technologies, low exposure to these developments.

In a nutshell, what I also see out there is what I very much want to share with you—technologies. I realize that there are two capacity needs. We need capacity—everybody needs capacity—to perform. Now, at that level, there are two capacity needs, and you know one. But you probably don't know the other. There have been programs to build our capacity through training, through credit financing, through family ways, through family interventions. But our second capacity need is the absence of capacity to capacity building.

I'm saying that it's the absence of a capacity in us to absorb capacity. So you may bring in intervention for trade. You may bring in interventions for market. You may bring interventions with policies, with productivity. But our weak point is the capacity building you are trying to do in us.

So probably the first responsibility, the first intervention, you need to do as a community of researchers and donors is to identify and to accept this need, this lack of capacity to absorb. Unless you do that first, whatever capacity you put in will not go far enough.

Let me also qualify that statement. From the researchers' work, we also need this to categorize the family community. We have failed to isolate small-scale farmers from subsistence farmers, from farmers who do farming as a business. They are both all in one entity. They work together, because probably what subsistence farmers may need from time to time would have to be provided by commercial-scale farmers, and probably the small-scale farmers may not find commercialization capacity in commercial farmers.

There has been talk of government and the objects of the infrastructure. Let me say something about infrastructure: You may have all the infrastructure, you may have all the roads, you may have all the marketing institutions. But take roads, for example. You may have a very good road

between Zambia, Malawi, and so on, or it could even be within the same country. You may have a good road connecting rural with the department, but if farmers do not have the means for transport, do not have delivery vans, do not have the means for carrying stuff from point A in the rural to point B in the towns, then it will not move. Thus, infrastructure development by government is not enough as far as poor small-scale farmers are concerned. We need interventions that would bring in the resources to facilitate the movement of rural people, of their products.

There has also been talk of information and information technology. You may have a cell phone. For instance, as a tomato grower, you know that behind the hills, the price of your tomato is 10 times the price the middleman is offering you here. At that point, a road is not enough. You still have to have the ability to move your tomatoes from here to the other side where it can get the best prices. So connectivity and mobility, apart from infrastructure, are more important for the small-scale farmer.

But let me also mention extension services, which are coming out very clearly in this workshop. Since there is very low information update because of low literacy levels at that substratum, we need very strong government-led extension services. We cannot do without government. Although these structural adjustment problems have really disrupted the whole system, we still need government facilitation, particularly in the delivery of agricultural services or extension services.

Probably the structural adjustment programs were intended to liberalize. They were meant to bring the power to the people. But the private sector has failed to come in. The private sector should mean power, resourcefulness, performance. So what is the private sector? Does it also mean small-scale farmers? Is it the type of private sector, for example, in Malawi that has resources to take over functions of government but that are not themselves interested in business. So despite privatization, the private sector is not going to pick up this government passport. They say this has failed because the private sector has failed to show interest in small-scale farming programs.

Governance has also let the small-scale farmers down. There has been so much done by donor communities. But probably because the donor community has used government structures as medium deliverer, in the end very little has trickled down because of high bureaucratic transaction costs. So I agree with you that probably we'll need an autonomous body that could facilitate the dissemination and devolution of donor funding to the poorest of the poor, because government itself has failed us and so many strata have also siphoned out the resources that were meant for the poor.

Commentator Remarks

Christie Peacock, Chief Executive, FARM-Africa, UK

I was asked to speak about 'difficult areas' and about services and institutions. I've really focused on what I believe is a synthesis of the key issues and about areas needing further research. We never really came up with a very good definition of "a difficult area." I think one man's difficult area is another woman's Garden of Eden. I think it is obvious that difficult areas are increasing, whether in a physical sense they are expanding or in the difficulties experienced by real people. But poverty indicators in difficult places are all going the wrong way. And some of this is likely to get worse because of global warming.

I think that in many of these difficult places, some people make their own difficulties, perhaps by doing inappropriate things, cropping in the wrong places, keeping cattle where they should be keeping camels—these kinds of things. But there are many, many people living in very difficult areas. I want to focus on what I might term "hopeless areas," or seemingly hopeless areas.

I'm amazed that in this meeting so far there has not been more discussion of the role of food aid. There is a rapid increase in the rise of food aid coming into Africa. It's been used in different ways in different places. There is a huge safety net program in Ethiopia going on at the moment, with five million households receiving six months of either food aid or cash guarantee equivalent.

This seems to be a massive process in the context of Africa, but we need to think about whether this is a much-needed welfare system for people in short-term need. Along the lines of our own welfare systems in developed countries. Or have we actually given up on these places? Are they going to have food aid forever? Is this the final institutionalization of food aid?

I think we also need to look a lot more in a more rational way at some of the solutions on offer and at the real costs of a future with or without food aid. By real costs I mean not just money; I mean the social costs of dependency, literal costs, as well as the benefits that accrue.

I also want to give an example of why I agree with Ian Scoones. I think this was an absurd disagreement that was posited between Peter Hazell and Frank Ellis. I want to give an example from Konso in Ethiopia. Konso is an extraordinary place, populated by the most remarkable people I've ever met. Konso's dry, rocky hills make it a desperate place to farm, The Konso are the hardest-working people. They build the most beautiful spectacular stone-faced terraces. They have to work hard to try to survive in that difficult, difficult environment. We in FARM-Africa have been working there for many years, and we've managed to set up a community development fund. I just want to share with you some of the things that people chose to invest in. They had a choice between applying for a matching grant for a community project or applying for a private personal loan. The matching grant was with labor input. What they chose to do with the grant was to plant trees on the communal areas.. When it came to personal loans, they invested in ox fattening a private tree nursery, a group got together to start a shoe factory.

Now, this is a place with very, very limited options. A remote, difficult place. And I think these decisions show what farmers can do when resources are channeled at the grass roots. The farmers are allowed to actually decide their own future.

Moving on to services, I think there is the need for an increasing role of the state in some form. And the dreaded rise of the return of the ministries of agriculture—we thought they were all going to quietly go away and disappear. Well, they lingered on, as we now know. Can they actually be reinvented? Are there radical new ways of making these things function in a responsiveflexive way? Currently, as Peter Hazell feels we need to do, we can use these mechanisms as new mechanisms to trigger higher investments, but we also need to get the private sector to come in and play its new role. Basically, we need some really radical thinking. To my knowledge, it's really only Uganda that's being radical in this area. I'm maybe unfamiliar with other circumstances.

I now move on to the realm of farmers' organizations, both in representing farmers and as the farmer's voice in the political process, as well as supplying support services to their members. I think we, who have all worked in rural areas, know very well that the nature of the business means there's a lot of local level cooperation. That's always been there. We also all know about traditional systems and cooperation in all sorts of different areas. But there is this political anomaly of these organizations not coalescing to have a larger and national voice. But I see from our work certainly in east Africa the immense distortions in government accountability when donors contribute a very large proportion of national budget. And these distort, I believe, the voice of farmers and negate it in some senses. But there are reasons for optimism that farmer organizations including co-operatives may work now when they failed in the past. They have a dreadful reputation all over Africa. Can we develop a new, much more democratic, transparent, accountable organization in the 21st century?

I think that we can, and I think there are many things that have changed. I think the farmers are much better educated. I think they're much better informed about what's going on in their country and about what's going on in the world. And I think that fundamentally there is a much more favorable governance environment, much better standards of accountability and transparency, and much greater expectations of these things among people than there were in the past.

Finally, I'm completely mystified that the issue of land consolidation hasn't come up as part of this transformation process. As a technical person it is obvious that the options that are open to you as an owner of two hectares of land are totally different than if you own half a hectare. It's obvious. In countries that have developed and grown and people have moved off farms, this is actually happening—farmers are cooperating in some way and sharing land, specializing perhaps together through putting together greater land areas. It seems to me that it's an area that needs some investigation.

Commentator Remarks

Ian Scoones, Fellow, Institute of Development Studies, UK

There is a broad consensus around the fact that small farms and small farmers can indeed be key to growth. But this raises a whole series of questions: For how many farmers, and at what scale? What is the speed of transition between small-scale farming and other forms of livelihood? In what direction will trends unfold in different places? What will drive much needed agricultural growth? What is the role of the state and donor aid in facilitating transitions?

All these questions have been raised in the workshop, but our discussion has sometimes been stuck in some false oppositions: between optimists and skeptics of agriculture; between farm and non-farm options; between agricultural and non-agricultural livelihoods; between rural and urban priorities; between subsistence and commercial farming, and so on. To be honest, these oppositions are not helpful. There has been a tendency to slip back into old sectoral divisions and debates that have dominated for so long, and are less relevant today. Often, we bring in unspoken assumptions about what we expect small-scale farming or small-scale agriculture and family farming to look like: often some idealized, integrated, full-time family farm. And with this we bring in contrasts of viability and non-viability, economic and uneconomic, often without specifying what we're talking about.

Instead, what I think we need, and what we got in some elements of the workshop presentations, is a more sophisticated and differentiated analysis. We had hints of this from some of the papers – around market orientation (Jayne), around non-farm activities (Haggblade) and around commodity systems (Poulton). I think these contrasts need to lead to some usable typologies that make sense of this diversity. We need to know which sub-groups in a highly differentiated sector need which sort of support. This will help us start thinking about the criteria for prioritizing limited public expenditure. For example, we need to ask what are the asset and capacity thresholds which allow movement into new agricultural enterprises, and what this would imply in terms of policy. Or, at the other extreme, what support is needed to facilitate transitions or exit into largely non-agricultural activities? Such analyses result in quite different types of policies. This requires a much more nuanced analysis than was evident in much of our discussions.

There are three specific challenges I would like to highlight. First, is the need for a *livelihood perspective*, in contrast to the dominant sectoral perspective, taking account of the continuously changing trade-offs between agriculture, diversification and migration strategies, and the significance of part-time farming in a wider portfolio of activities. For example, I was surprised how migration in particular was given little mention in our discussion, despite the recognized importance of remittances, and the increasing mobility of populations. Second, is the development of *typologies* to look at different livelihood options in different settings, and an assessment of key interlocking constraints for agricultural growth. Third, is the development of some alternative, long-term *scenarios* for different places, commodities and groups of people, looking at what needs to be done. In our discussions we had a lot of diagnosis, much of it very familiar, but little forward looking discussion about what next?

In all this we need to be more sophisticated about history and change. There have been a lot of assumptions about what is happening, based either on assumptions about 'stages' of development, or sometimes spurious conclusions about change drawn from cross-country assessments. Too often we draw false or inappropriate historical parallels. I would like to have heard about a few more empirical cases in the papers, so that we could start to develop a more context-specific analysis, rather than relying on the broad and generic assessments of much of our discussions. For the future, a key task will be to think about the different trajectories of change encountered, and the implications of these. There is never just an inevitable sequence of historical unfolding, but we need to encompass ideas of thresholds, break points, surprises and discontinuity.

As our discussions have emphasized, future options and patterns of constraints and trajectories of change are centrally influenced by politics and policy, often operating way beyond the rural locality. It was excellent to have a politics and policy session: in many ways such debates are central, and should perhaps have been our starting not ending point. We should not separate our analyses of economics from political and policy analysis, but we should integrate them much more

firmly in my view. Some very fundamental questions arose from the workshop which focused on the political economy of agrarian change. I want to briefly highlight five.

First, in the post-liberalization era, we have new elites who have benefited from new patterns of accumulation and neo-patrimonial connections. This has given rise to a changed configuration of agrarian politics and different sets of interests. And, to some extent, these may challenge some of the preconditions—land reform, for example—for the essential agrarian transformations we have been talking about. Second, processes of democratization and urbanization and shifting patterns of voting have also resulted in new interests and pressures emerging, sometimes against rural investment and reform. Third, the donor and aid framework – notably direct budget support - has major implications for the politics of aid and budget allocation, with varied consequences for agriculture. Fourth, the nature of globalization - and particularly the role of corporate players with important alliances with new political elites – has major implications for agriculture, pushing market reform and technology policies, for instance, in particular ways. Finally, there is the whole question about voice and organization. How can a small farmer, with a lack of say in national and international processes, have a voice - particularly a group of people who are perhaps only part-time farmers?

In conclusion, I would say that overall we need to invest considerably more effort in understanding the politics of policy processes that underpin and mediate the processes of policy implementation. We need to ask, for example: what are the political and social underpinnings of real institutions and real markets in real African settings? What frames policy directions, and how are these pushed by what actors with what interests? Let's try to understand the political context for market and institutional change, for instance, rather than relying simply on an analysis of how a particular balance of transactions costs affect assumed rational choices.

I think there is a big research agenda in understanding the politics of policy and the politics and social underpinnings of institutions and markets. And this agenda needs to build on a much more sophisticated, contextually-based and empirically-grounded understanding.

Debate between Simon Maxwell and Peter Hazell

Panelist: *Peter Hazell, Senior Institute Fellow, International Food Policy Research Institute (IFPRI), USA*

Panelist: *Simon Maxwell, Director, Overseas Development Institute (ODI), UK*

Moderator: *Joachim von Braun, Director General, International Food Policy Research Institute (IFPRI), USA*

JOACHIM VON BRAUN: I would like to ask our two colleagues Peter Hazell and Simon Maxwell to come up here for a debate. The controversy that brought us here was the future of small farmers. As happy as we are about the progress of this workshop, I think that we should not gloss over the existing controversies, because they have a real meaning for actual development policymaking at both a global level and a national level. Simon and Peter have been part of this long-term controversy, so the purpose of the debate will be to check where disagreements come from. If we manage to highlight points for which we can find a clear agreement, we will have progressed and we may make a contribution in this forum that we can take to policymakers. I have asked Simon and Peter to present their three main messages for action that they would like to give to policymakers.

SIMON MAXWELL: My first point is that we need a strong story line on agriculture and small farms. Other sectors, HIV/AIDS for example, do it better, making a strong, united and convincing case. As a result, they are attracting the money; we are not.

PETER HAZELL: I don't think anything really is going to change until we have serious political commitment by African countries to invest in agriculture and to level the playing field for small farmers. Look at India. They didn't do much for agriculture until President Johnson threatened to stop the food aid programs. But in a couple of years, you saw a drastic change in Indian policies and institutions for the agriculture sector and those led to the Green Revolution. China made the same kind of commitment after people starved because of past failures in their approach. We are not seeing that kind of new commitment in Africa yet despite widespread poverty and malnutrition. By providing generous amounts of food aid and support for safety net programs, donors are inadvertently protecting African policymakers from having to make hard budgetary choices. We need to see the level of public commitment go up in the form of increased shares of public expenditure going to agriculture and in the reform of public institutions serving agriculture. Simon, we have to stop arguing with each other. We can agree that agriculture is only half the answer. We can agree on nuances and conditions. But we have to have a very clear message to African policymakers that shows agriculture and small farms are an important part of their solution.

SIMON MAXWELL: I agree absolutely; but we need a very strong message for African ministers as well as for developed countries. I have become increasingly concerned about the arguments for small farm-led development and in particular for cereal-based and small farm-led agricultural development. This is for at least four reasons. First, the rapid pace of technical change, which may disadvantage small farms and require higher levels of skill than they can muster. Second, the rapid fall of prices in general and cereal prices in particular, which mean that any new Green Revolution will have to take effect at half the price of the last one. Third, the revolution in supply chains, which in many cases will make it much more difficult for small farmers to compete. Fourth, the spread of multi-locational and multi-occupational farm households, which often result in farming being a part-time activity.

It follows that we need to make a case for a new model. It may in some circumstances not be a small farm model at all. We always need a single sheet of paper to give to ministers, and that single sheet should not be the single sheet we handed them in the 1960s.

PETER HAZELL: My second message is for the international community, which includes most of us: We really have to stop looking for the single magic bullet that's going to transform African agriculture—whether it's some new technology, soil management practice, high value export, privatization, or micro finance approach. The international community tends to get so excited about new things one at a time, thinking each is going to change everything. And then five years later, when that hasn't worked they move on to the next new thing. This isn't working. I think development involves doing a lot of things at the same time, including a lot of old things. You have to have roads, fertilizer and seed. You have to have markets. You have to have information. You have to have water. You have to have all these things at the same time to make progress.

But it is more than just doing the old things better and in new ways; it's recognizing that we do live in a different economic world today. Simon's quite right, but we have to make these things work in the current context. There are no shortcuts for agricultural development on a continent like Africa. There is no cheap way out.

SIMON MAXWELL: We have to be highly selective in thinking about where small farm agricultural growth will take place. As a result of the Sachs Report, the dominant discourse in 2005 is the big push. The implication is that we will make a long list of public goods needed to secure agricultural growth and simply calculate the amount of money needed. That is not realistic. Planning is about choosing, and we have to act within budget constraints, picking priorities and strategizing. As we do that, there are two key priorities.

The first was really implicit in Kisamba-Mugerwa's presentation this morning, and that is to define small farm and agricultural businesses that have potential and help them grow. These are going to be businesses that have the potential to move away from cereals and into new products and new markets. That's going to be highly selective. We're going to be talking about areas that probably have high potential and where there are connections to the international market or to large urban centres. Some of the participants in these new and thriving agricultural businesses will not be small farms, but many of them can be small farms. What I especially like about this new model is that small farms have participated successfully in what one might think of as a modern supply chain. And, of course, everything is very location-specific. We need to be highly selective in our investments, and that is a complicated process.

But that doesn't mean we should neglect the people who can't participate in these businesses: we need a different strategy for small farms in low potential areas. What we have to do is help people make a low-risk and long-term remunerative exit from agriculture. We shouldn't neglect the poorest, and we need to find risk-minimizing safety nets.

The key message I want to leave is about planning and choosing. Not small farms everywhere; not small farms with no qualification; not small farms where there is a completely unmanageable risk of growing successfully. Instead, let's talk about islands, growth poles, pockets of commercial small farm agriculture where we can really see successful long-term growth.

PETER HAZELL: I too am concerned about the big push. It's another magic bullet, perhaps a magic canon ball. I'm concerned about the technological and institutional constraints that cannot be moved within the time frame of the big push. Unless the focus is on basics like improving infrastructure, agricultural research, agricultural services, education, health, etc., which will take more time than big push permits, then I doubt it's going to transform African agriculture.

Of the many things that need to be done, I give my highest priority to getting agricultural support systems back for African farms. I'm much less willing to say which commodities and which African farmers should be prioritized. I happen to think food staples also offer good possibilities in the future as Africa is projected to double its food staples needs by 2020. I would rather let farmers and the market sort out who should grow what and where. But for this to happen farmers must have basic support systems that provide them with access to fertilizer and improved seeds. It's also ridiculous

that most African farmers cannot access agricultural loans these days. How can we expect them to be competitive? Farmers must also have marketing institutions that work. And we need these basic services to be available for farmers of all sizes and types. Only then can markets sort out who should grow what on a competitive but fair basis. These basic services ceased to exist for most small farmers with the structural adjustment programs. The public sector pulled out but the private sector hasn't really come in, and it isn't going to come in, within the next decade or so to the extent that is required. We have to get the public sector back to playing its key role. This is not to argue that it should resume its old role with highly inefficient parastatals and hefty subsidies. Rather it needs to play a new role based on institutional innovations that need to be thought-out and which will require a different kind of partnership with the private sector and civil society.

JOACHIM VON BRAUN: Well, I asked these two gentlemen to present their main messages and highlight the main points of the controversy that we have identified over the past three days. I would like to present my message now. I think we still see a difference in assessment on how to handle the transformation. I think we have an agreement that the small farm sector is to be transformed through growth processes and through societal change. But I think you are unclear, maybe also more broadly our workshop is unclear, about the desired speed of the transformation. There are clear articulations of speed it up. And the clear articulation of give it time. What is not clear is what should drive that transformation process? The engine of growth or the urban pull? Investing in opportunities for building human capital in urban areas or building small farmers' capital? Where do you come out on the transformation process and its desired speed and its desired outcome?

PETER HAZELL: Historically, it's an intergenerational transformation, and I really do think it's going to take time. A country like Ethiopia, where 85 percent of the population is rural and engaged in agriculture, will still have a lot of small farms in 20 years. The only question is, are they going to be prospering farms or are they going to be parking lots for the poor?

My biggest worry right now is that globalization threatens to accelerate the pace of exit, but not in a constructive way. It's not going to be agricultural growth driving economic diversification that pulls workers out of farming into better paying jobs. Rather, it's going to be much more of a push phenomenon in which small farmers are simply squeezed out of agriculture before there are viable alternative livelihoods available on the scale required. If we do not level the playing field for small farmers then many African countries may be faced with a massive exodus of people in the near future, which will simply overwhelm their capacity to cope. The cost of dealing with that wave of distress will dwarf the cost of investments in small farm agriculture that could help prevent it.

SIMON MAXWELL: Well, first of all, the urban population of West Africa was 70 million in 1990; it will be 270 million by 2020. There will be 30 cities of a million or more. I often use an IFPRI chart to demonstrate that in developing countries as a whole, urban population will exceed the rural by 2020.

So the question is not what would we like the transformation to be; the question is what will the transformation be like, whether we like it or not. And then we have to ask ourselves, country by country, what the job prospects and livelihood prospects are for people making this transition.

I think we should not be too pessimistic about urbanization. For example, research is being carried out by colleagues at the Overseas Development Institute on short-term migration, or commuting from rural areas to urban areas. People with traditional caste occupations in India, like gravediggers, suddenly find new employment digging channels for fiber optic cables in town. They are using the opportunity of migration to diversify out of their caste into a new occupation.

I would like to argue that urban development is understudied. For example, Ethiopia is a country where the main policy thrust has been agricultural development-led industrialization. My view is that what Ethiopia needs more is industrialization-led agricultural development, because unless it is possible to create more jobs off the farm, we're going to get increasingly small farms with increasingly

large number of adults seeking a living in extremely poor conditions. That doesn't mean there are not some very good agricultural prospects also in Ethiopia.

JOACHIM VON BRAUN: Gentlemen, do you differ on the role of the state, your judgment about agriculture technology, your assessment of the role of the small farmer, per se, in all of this?

PETER HAZELL: Actually, I think the real point of disagreement between me and Simon is the role of urban areas and the nonagricultural sector. Just how big an engine of growth can the non-agricultural sector offer compared to agriculture? In Ethiopia the industrial sector is still tiny and even if it grew rapidly it would still take decades before it could productively employ a large share of the national work force. This is a key issue. You can't just push people into urban areas and hope they will find useful things to do. There has to be an economic base that's growing rapidly enough to create the jobs that they're going to need when they get there. I know though from our own work at IFPRI that agricultural growth alone is not sufficient to provide the kind of growth rates most African countries need. They also need urban-based industrial growth, exports of high value crops, and to exploit inter-sectoral growth linkages. Both are needed and I think that's probably the resolution. It's not agriculture alone; it's not urban-based livelihood alone; it's the combination of the two and getting that balance right and getting the right investments needed to achieve that balance. I think that's where the solution lies. And we're very misleading if we push just one way and ignore the other.

JOACHIM VON BRAUN: Is that an item of consensus, Simon?

SIMON MAXWELL: Yes.

JOACHIM VON BRAUN: We have reached consensus. Let me ask Simon and Peter to make concluding comments.

SIMON MAXWELL: I have three points to make. The first is the importance of making the case internationally. For example, five dollars for a bed net saves a life from malaria – and that example raises millions. What are we going to say about agriculture that's going to raise similar amounts of money? Frankly, I don't think we are equipped.

Point two: Selectivity is absolutely essential, but where is the policy arena for making choices? The answer is in the poverty reduction strategy paper (PRSP) process. We've been really bad at that. The first generation of PRSPs were all about health and education expenditure, hardly at all about the productive sectors. We need a postcard in our back pocket that lists the two paragraphs on agriculture we want to see in the PRSP. Those paragraphs need to be highly selective. They're going to say there are certain areas where we can really make a difference – for example, in Ethiopia, let's develop the horticulture industry. The story has to be at the country level, and it has to come out of an analytical and consultative process.

At the international level, there's a more complicated issue about selectivity, which I don't have time to go into. My main argument is that basic rights have to be guaranteed. Basic food, basic health, basic education for everybody.

The third and final point I want to make is what this debate means for us as researchers. We have to get out of the box and do interdisciplinary work. At ODI, we have 60 researchers, with every discipline you can imagine—geographers, lawyers, economists—working on problems and not on sectors. I think that's the way forward. The key challenge now is in networks and partnerships, and that's where we should take this conversation.

PETER HAZELL: I wonder if we are not trying to tell too complicated a story for agriculture, tying it too tightly with poverty, employment and social problems. We live in a world where the focus is on privatization and private sector led globalization, so why not trim our narrative down to a business story? There are lots of wonderful investment opportunities in agriculture, even in small farms, and

which require both public and private sector investment to realize. We also know that good business investments in small farms can also address poverty and other social problems, that they can be win-win investments.

In terms of future policy research, I have two high priorities. First is research on how to obtain serious national commitment to agriculture in African countries. Why is it that when Uganda had such a charismatic minister of agriculture as Kisamba-Mugerwa, who had a vision—a business-oriented vision for agriculture that was going to help lots of small farms, lots of poor people in Uganda, his president and his minister of finance gave him only 2 percent of the nation's budget instead of the required 6%. This is one of the lowest shares in all of Africa. What goes wrong in the political process that leads to such an outcome, especially in a country that seems otherwise to be very committed to agriculture development? We need to provide the kind of research that can make the difference on political commitment.

My second priority is research on the role of the public sector, particularly in the provision of agricultural services and marketing. We have to bring the public sector back in to African agricultural development and the question is how to do it? What kinds of institutional innovations are needed and what is the public sector's role?

Closing Session

Summary of the Open Discussion

A brief open discussion during the closing session tried to take a more comprehensive look at the main issues of the seminar. Among other things, the overall direction of development policies, the trends in smallholder farming and their implications, the recent promising technological advances, as well as the limitation of the economics profession to single-handedly tackle the challenges of small farmers were discussed.

A participant, who described himself as “employment fundamentalist” rather than “small farms fundamentalist,” argued that any successful development strategy must have good scenarios for increasing demand for labor, since the great majority of the poor rely on labor income. He felt that this employment-intensive growth path would have to be based substantially on small farms. A debate unfolded about what proportion of smallholders can be effectively integrated into modern markets. One participant argued that according to existing empirical evidence, only the top two quintiles can participate in markets, given current levels of technology, in countries like Ethiopia, Rwanda, Malawi, and Zimbabwe. He felt that the problems facing the remaining farmers will need to be addressed by focusing on the land issue. Another noted, however, citing Asian experience, that a much larger proportion of small farms can sustain themselves with proper agricultural policies.

Consolidation of farms was promoted by one participant, who felt that pulling together various fragments of a single landholding would be beneficial for a smallholder, although such a proposition is quite expensive to implement. On the other hand, consolidation of various small farms into a larger one is not necessary, since evidence indicates that small farmers actually choose to operate small farms (“vote with their feet”), rather than large ones. Another felt, however, that farm size choice is forced for many rural poor. As the discussion turned to technology, recent technological advances that provide room for optimism—such as progress on NERICA rice, cassava, and bananas—were highlighted, especially since these innovations are taking place despite very low levels of public investment in research and development. However, the fertilizer crisis in Africa was emphasized as a critical issue that must be addressed in order to see improvement in agriculture.

A participant noted the limitations of the economics discipline to fully understand the phenomenon of smallholder agriculture, since by promoting the use of quantitative research methods and aggregating data, it precludes researchers from gaining insights into heterogeneity and diversity of small farms, which need a case study approach. Another mentioned that the discussion of Africa throughout the workshop has been quite selective, with an underlying assumption that intercountry variation does not exist. He also noted that about 15 countries in the region that are affected by civil strife were not mentioned once in the discussion. One of the last participants stated that empowerment will be key to resolving the problems faced by small farmers. In her opinion, rethinking ourselves as researchers and policymakers, engaging a diverse set of experts, and looking beyond agriculture to find solutions for agriculture is at the root of an effective strategy.

Chairperson Remarks

Joachim von Braun, Director General, International Food Policy Research Institute (IFPRI), USA

With the workshop coming to closure, some controversies regarding the future of small farms remain unresolved, hinging on diverging views of:

- whether this future presents a bright opportunity for development policy,
- whether it is a nonissue, or
- whether it is a bombshell if the transition of small farmers is mismanaged.

I conclude that it could be all of these three in different contexts of the developing world.

It is noteworthy, however, that islands of consensus have also emerged during the past three days—with recognition of the enormous diversity and heterogeneity of small farmers being one of the most important ones. This means you are always right and wrong if you state something general about “the small farmers.” This leads me to propose as a first set of conclusions:

- we must define “small farmer” clearly; and
- we may overcome small farm related ideology with thoughtful typology! In other words, the application of typologies that capture context may be helpful for identifying roles and transition scenarios of small farmers, as well as appropriate policy actions for small farmers.

Among the broad conclusions, the following stand out:

1. Most of us agree that structural transformation in the developing countries poses a challenge. The controversy arises on the desired speed of this transformation, along with the specific approaches to facilitate it.
2. Should we be focusing on fostering urban pull approach or relying on a rural engine of growth approach? The latter convinces with an attempt to conceptualize growth endogenously, rather than keeping it largely exogenous. However, it is possible that further research can highlight other drivers of growth, including non-agricultural technology penetrating rural areas, such as communications technology.
3. The workshop stressed that small farmers’ aspirations need to be recognized. This means that their voices, votes, and rights, including property rights to land, need strengthening; that gender roles must be explicitly considered; and that strong and independent farmer organizations need to provide an opportunity for small farmers to engage in political and economic processes.
4. There remains a controversy as to whether small farmers should benchmark against large farmers or against other small business (the “small nonfarmer”). The usefulness of one or the other depends on the issues addressed.
5. The “economy of scale” question and the benefits and costs of smallness must be revisited to understand whether these complexities can be addressed through new institutions and organizations, such as risk markets, insurance schemes, cooperatives, and contract farming.
6. Barriers to transformation of the small farm sector are still pervasive, as represented by both direct barriers to input use and indirect barriers through labor market and labor mobility constraints. As we pursue growth-driven change, we must keep in mind the importance of facilitating choices and exit strategies and offering intergenerational chances for small farmers to opt out of agriculture. The issue of false economies of scale as represented by anti-small-farm regulations also warrants close attention. We do know, however, that access to information and communications technology (ICT) changes scale economies in rural areas.

7. One of the goals of global food and agriculture industries (agro-industries, food-processing industries, supermarket industries) is to reach the “bottom of the pyramid.” What is unclear is whether business strategies represent an opportunity or a loss for small farmers.
8. Many at this workshop agreed that the optimal way to assess various scenarios of the future of small farmers is through food or value chain analysis. Pro-poor action is critical in this context and should entail institutional innovation at critical points in the chain and strong roles of the processing elements for rural employment.
9. We were in agreement that pro-poor small farmer technology is needed. Yet science and technology policy for small farms remains underfunded, despite the fact that returns to investment in the small farm sector tend to be high and pro-poor.
10. Similarly, we were in agreement about large new risks due to HIV/AIDS in Africa and possibly in other regions. We also acknowledged that new attention to women and to the child labor issue in small farming is needed and that ultimately assets, access to markets, and institutions play a key role.
11. The role of state in markets and services for small farmers was a hotly disputed topic, as were the impacts of decentralization. Participants agreed that the situation in Africa is very different from that in much of Asia and Latin America. There is an urgent need for institutions that can cut transaction costs as well as for those that can provide access to finance for smallholders.
12. There was a broad recognition that national and subregional policies are of primary importance. Further, there was agreement that agriculture’s contribution to growth and poverty reduction is underrated and is, in fact, larger than its sector share.

In sum, I would like to note a portfolio of key areas for attention and action that emerged from the discussion:

1. With regard to advocacy, it is time to recognize that the small farmer issue is a global one, and it has always been partly a transition issue, i.e. transition into non-farm employment, often combined with migration.
2. Moreover, it is a public policy, as well as a business strategy, issue and, as such, it belongs high on the development policy agenda.
3. While aid, debt relief, and trade liberalization help promote development and growth, they are not sufficient. Policies and institutions must change, especially in the rural services area to achieve successful outcomes for small farmers.
4. Public investment and incentives for private investment need to be refocused on small farmer growth, and the conditions for their implementation must be strengthened.
5. Smart safety nets for the vulnerable groups are critical for the support of transformation of the small farm sector and transition.
6. Strengthening productive rural-urban linkages through infrastructure, both soft and hard, and through education is imperative for long-term growth.

APPENDICES

The Future of Small Farms

Research Workshop

Organized by
International Food Policy Research Institute (IFPRI/2020 Vision Initiative)
Overseas Development Institute (ODI)
Imperial College, London

Withersdane Conference Centre, Wye, Kent, UK
June 26–29, 2005

Program

(as of June 23, 2005)

Sunday, June 26

1900 Inaugural Dinner
Keynote speaker: **Gordon Conway**, Chief Scientific Advisor, UK Department for International Development (DFID), UK

Monday, June 27

- 0830–0845 **Introductory and Welcome Remarks**
Rajul Pandya-Lorch, Head, 2020 Vision Initiative, International Food Policy Research Institute (IFPRI), USA
Steve Wiggins, Research Fellow, Rural Non-Farm Economy and Urban-Rural Relations, Overseas Development Institute (ODI), UK
Colin Poulton, Research Fellow, Centre for Development and Poverty Reduction, Imperial College London, UK
- 0845–1100 **Session 1: The Role of Agriculture in Pro-Poor Growth**
Chair: **Tim Foy**, Chair, Renewable Natural Resources and Agriculture Team, UK Department for International Development (DFID), UK
Paper presenter: **Alberto Valdés**, Independent consultant, Chile
Paper presenter: **Peter Hazell**, Director, Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), USA
Discussant: **Luis Llambí**, Professor of Anthropology, Department of Anthropology, Venezuelan Institute for Scientific Research (IVIC), Venezuela
Discussant: **Funing Zhong**, Dean, College of Economics and Trade, Nanjing Agricultural University, China
- 1100–1130 COFFEE AND TEA BREAK
- 1130–1230 **Session 2: Market Opportunities: Markets, Trade, and Competitiveness**
Chair: **Akinwumi Adesina**, Associate Director, Food Security, the Rockefeller Foundation, Kenya
Paper presenter: **Tom Reardon**, Professor, Department of Agricultural Economics, Michigan State University, USA
Paper presenter: **Prabhu Pingali**, Director, Agricultural and Development Economics Division (ESA), UN Food and Agriculture Organization (FAO), Italy
- 1230–1330 LUNCH
- 1330–1445 **Session 2 (continued): Market Opportunities: Markets, Trade, and Competitiveness**
Chair: **Akinwumi Adesina**, Associate Director, Food Security, the Rockefeller Foundation, Kenya

Discussant: **David King**, Secretary General, International Federation of Agricultural Producers (IFAP), France
Discussant: **Alejandro Schejtman**, Senior Research Fellow, Latin American Center for Rural Development (RIMISP), Chile

1445–1515 COFFEE AND TEA BREAK

1515–1730 **Session 3: Smallholder Farming in Difficult Circumstances**

Chair: **Steve Wiggins**, Research Fellow, Rural Non-Farm Economy and Urban-Rural Relations, Overseas Development Institute (ODI), UK
Paper presenter: **Ruerd Ruben**, Associate Professor, Development Economics Group, Wageningen Agricultural University, Netherlands
Paper presenter: **Thom Jayne**, Professor, Department of Agricultural Economics, Michigan State University, USA
Discussant: **Marcela Villarreal**, Director, Gender and Population Division, FAO Focal Point for HIV/AIDS, Sustainable Development Department, UN Food and Agriculture Organization (FAO), Italy
Discussant: **Sukhadeo Thorat**, Professor of Economics, Center for the Study of Regional Development, School of Social Science, Jawaharlal Nehru University, and Director, Indian Institute of Dalit Studies, India

Tuesday, June 28

0830–1045 **Session 4: Employment, Migration, and the Nonfarm Economy**

Chair: **Jim Harvey**, Head, Rural Livelihoods Department, UK Department for International Development (DFID), UK
Paper presenter: **Frank Ellis**, Chief Executive Officer, Overseas Development Group, University of East Anglia, UK
Paper presenter: **Steven Haggblade**, Senior Research Fellow, Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), Zambia
Discussant: **Anke Niehof**, Chair, Sociology of Consumers and Households Group, Mansholt Graduate School of Social Sciences, Wageningen University, Netherlands
Discussant: **Julio Berdegue**, President, Latin American Center for Rural Development (RIMISP), Chile

1045–1115 COFFEE AND TEA BREAK

1115–1215 **Session 5: Productivity of Small Farms: Technology and Innovation**

Chair: **Isaac Minde**, Coordinator, Association for Strengthening Agricultural Research in Eastern and Central Africa / Eastern and Central Africa Programme for Agricultural Policy Analysis (ASARECA/ECAPAPA), Uganda
Paper presenter: **Michael Lipton**, Research Professor of Economics, Poverty Research Unit, School of African and Asian Studies, University of Sussex, UK

1215–1315 LUNCH

1315–1430 **Session 5 (continued): Productivity of Small Farms: Technology and Innovation**

Chair: **Isaac Minde**, Coordinator, Association for Strengthening Agricultural Research in Eastern and Central Africa / Eastern and Central Africa Programme for Agricultural Policy Analysis (ASARECA/ECAPAPA), Uganda
Discussant: **Nick Vink**, Professor in Agricultural Economics, Department of Agricultural Economics, University of Stellenbosch, South Africa
Discussant: **Robert Tripp**, Research Fellow, Rural Policy and Governance Group, Overseas Development Institute (ODI), UK

1430–1500 COFFEE AND TEA BREAK

1500–1715 **Session 6: Services, Institutions, Intermediation: New Directions**
Chair: **Sarfraz Qureshi**, Director, Innovative Development Strategies (Pvt.) Ltd., Pakistan
Paper presenter: **Jonathan Kydd**, Professor of Agricultural Development Economics,
Director, Imperial College London Distance Learning Programme, Imperial College
London, UK
Paper presenter: **Hardeep Singh**, President, Cargill India, India
Discussant: **Johann Kirsten**, Professor and Head, Department of Agricultural
Economics, Extension and Rural Development, University of Pretoria, South Africa
Discussant: **Eleni Gabre-Madhin**, Program Leader, New Ethiopia Country Strategy
Support Program, Development Strategy and Governance Division, International Food
Policy Research Institute (IFPRI), Ethiopia

Wednesday, June 29

0830–1045 **Session 7: Policy and Politics for Smallholder Agriculture**
Chair: **Simon Maxwell**, Director, Overseas Development Institute (ODI), UK
Paper presenter: **Wilberforce Kisamba-Mugerwa**, Director, ISNAR Division,
International Food Policy Research Institute (IFPRI), Ethiopia
Paper presenter: **Regina Birner**, Research Fellow, Development Strategy and
Governance Division, International Food Policy Research Institute (IFPRI), USA
Discussant: **Nicolas van de Walle**, Professor of International Studies, Professor of
Government, and Director, Mario Einaudi Center for International Studies, Department of
Government, Cornell University, USA
Discussant: **Robert Paarlberg**, Professor of Political Science, Department of Political
Science, Wellesley College, USA

1045–1115 COFFEE AND TEA BREAK

1115–1330 **Closing Session: Synthesis Panel**
Chair: **Joachim von Braun**, Director General, International Food Policy Research
Institute (IFPRI), USA
Panelist: **Glyvyns Chinkhuntha**, Executive Director, Freedom Gardens, Malawi
Panelist: **Christie Peacock**, Chief Executive, FARM-Africa, UK
Panelist: **Ian Scoones**, Fellow, Institute of Development Studies, UK

1330–1345 **Next Steps and Closing Remarks**
Rajul Pandya-Lorch, Head, 2020 Vision Initiative, International Food Policy Research
Institute (IFPRI), USA
Steve Wiggins, Research Fellow, Rural Non-Farm Economy and Urban-Rural Relations,
Overseas Development Institute (ODI), UK
Colin Poulton, Research Fellow, Centre for Development and Poverty Reduction,
Imperial College London, UK

1345–1445 LUNCH

The Future of Small Farms Research Workshop

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Workshop Participants

Akinwumi Adesina, Associate Director, Food Security, The Rockefeller Foundation, Kenya

Julio Berdegúe, President, Latin American Center for Rural Development (RIMISP), Chile

Yvan Biot, Environment and Livelihoods Adviser, UK Department for International Development (DFID), UK

Regina Birner, Research Fellow, Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), USA

Daniel Bradley, Rural Livelihoods Adviser, Agriculture Team, Policy Division, UK Department for International Development (DFID), UK

Maria Angeles Catelo, Assistant Professor, College of Economics and Management, University of the Philippines Los Banos, Philippines

Glyvyns Chinkhuntha, Executive Director, Freedom Gardens, Malawi

David Colman, President Elect, International Association of Agricultural Economists (IAAE), and Professor of Agricultural Economics, School of Social Sciences, University of Manchester, UK

Gordon Conway, Chief Scientific Adviser, UK Department for International Development (DFID), UK

Achilles Costales, Livestock Economist, Pro-Poor Livestock Policy Facility, Livestock Sector Analysis and Policy Branch (AGAL), UN Food and Agriculture Organization (FAO), Italy

Elizabeth Cromwell, Research Fellow, Rural Policy and Governance Group, Overseas Development Institute (ODI), UK

Morgane Danielou, Communications Specialist, Communications Division and Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), USA

Andrew Dorward, Reader in Agricultural Development Economics, and Director, Centre for Development and Poverty Reduction, Imperial College London, UK

Frank Ellis, Chief Executive Officer, Overseas Development Group (ODG), University of East Anglia, UK

Tim Foy, Chair, Renewable Natural Resources and Agriculture Team, UK Department for International Development (DFID), UK

Eleni Gabre-Madhin, Program Leader, New Ethiopia Country Strategy Support Program, Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), Ethiopia

Steven Haggblade, Senior Research Fellow, Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), Zambia

Jim Harvey, Head, Rural Livelihoods, UK Department for International Development (DFID), UK

Peter Hazell, Director, Development, Strategy, and Governance Division, International Food Policy Research Institute (IFPRI), USA

Antonio Hill, Global Adviser, Programme Policy Team, Oxfam GB, Colombia

Srinivasan Iyer, Livelihoods Adviser, UK Department for International Development (DFID), India

Thom Jayne, Professor, Department of Agricultural Economics, Michigan State University, USA

Laura Kelly, Trade Policy Coordinator, International Trade Department, UK Department for International Development (DFID), UK

David King, Secretary General, International Federation of Agricultural Producers (IFAP), France

Johann Kirsten, Professor and Head, Department of Agricultural Economics, Extension and Rural Development, University of Pretoria, South Africa

Wilberforce Kisamba-Mugerwa, Director, ISNAR Division, International Food Policy Research Institute (IFPRI), Ethiopia

Jonathan Kydd, Professor, Agricultural Development Economics, and Director, Imperial College London Distance Learning Programme, Imperial College London, UK

Jennifer Leavy, Adviser, Agriculture Team, UK Department for International Development (DFID), UK

Michael Lipton, Research Professor of Economics, Poverty Research Unit, School of African and Asian Studies, University of Sussex, UK

Luis Llambí, Professor of Anthropology, Department of Anthropology, Venezuelan Institute for Scientific Research (IVIC), Venezuela

Simon Maxwell, Director, Overseas Development Institute (ODI), UK

Madelon Meijer, Economist/Associate Professional Officer, Agricultural Sector in Economic Development Service (ESA), Economic and Social Department, UN Food and Agriculture Organization (FAO), Italy

Isaac Minde, Coordinator, Association for Strengthening Agricultural Research in Eastern and Central Africa / Eastern and Central Africa Programme for Agricultural Policy Analysis (ASARECA/ECAPAPA), Uganda

Wilfred Mwangi, Regional Economist, International Maize and Wheat Improvement Centre (CIMMYT), Kenya

Oksana Nagayets, Research Analyst, 2020 Vision Initiative, International Food Policy Research Institute (IFPRI), USA

Radhika Nayak, Consultant, Agriculture Team, UK Department for International Development (DFID), UK

Anke Niehof, Chair, Sociology of Consumers and Households Group, Mansholt Graduate School of Social Sciences, Wageningen University, Netherlands

Robert Paarlberg, Professor of Political Science, Department of Political Science, Wellesley College, USA

Rajul Pandya-Lorch, Head, 2020 Vision Initiative, and Chief of Staff, Director General's Office, International Food Policy Research Institute (IFPRI), USA

Christie Peacock, Chief Executive, FARM-Africa, UK

Prabhu Pingali, Director, Agricultural and Development Economics Division (ESA), UN Food and Agriculture Organization (FAO), Italy

Nigel Poole, Senior Lecturer, Centre for Food Chain Research, Department of Agricultural Sciences, Imperial College London, UK

Colin Poulton, Research Fellow, Centre for Development and Poverty Reduction, Imperial College London, UK

Sarfraz Qureshi, Director, Innovative Development Strategies (Pvt.) Ltd., Pakistan

Tom Reardon, Professor, Department of Agricultural Economics, Michigan State University, USA

Alejandro Schejtman, Senior Research Fellow, Latin American Center for Rural Development (RIMISP), Chile

Ian Scoones, Fellow, Institute for Development Studies (IDS), UK

Hardeep Singh, President, Cargill India, India

Rachel Slater, Research Fellow, Rural Poverty and Governance Group, Overseas Development Institute (ODI), UK

Colin Thirtle, Professor in Agricultural Economics, Imperial College of Science, Technology and Medicine, Department of Environmental Science and Technology, UK

Susan Thompson, Senior Policy Adviser, Bureau of Economic Growth, Agriculture, and Trade, US Agency for International Development (USAID), USA

Sukhadeo Thorat, Professor of Economics, Center for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, and Director, Indian Institute of Dalit Studies, India

Alan Tollervey, Livelihoods Adviser, UK Department for International Development (DFID), Uganda

Salil Tripathi, Reporter, UK

Robert Tripp, Research Fellow, Rural Policy and Governance Group, Overseas Development Institute (ODI), UK

Alberto Valdés, Independent consultant, Chile

Nicolas van de Walle, Professor of International Studies, Professor of Government, and Director, Mario Einaudi Center for International Studies, Department of Government, Cornell University, USA

Florence van Houtte, Administrator, Rural Development and Environment, Development Directorate General, European Commission, Belgium

Marcela Villarreal, Director, Gender and Population Division, FAO Focal Point for HIV/AIDS, Sustainable Development Department, UN Food and Agriculture Organization (FAO), Italy

Nick Vink, Professor in Agricultural Economics, Department of Agricultural Economics, University of Stellenbosch, South Africa

Joachim von Braun, Director General, International Food Policy Research Institute (IFPRI), USA

Klaus von Grebmer, Director, Communications Division, International Food Policy Research Institute (IFPRI), USA

Steve Wiggins, Research Fellow, Rural Non-Farm Economy and Urban-Rural Relations, Overseas Development Institute (ODI), UK

Funing Zhong, Dean, College of Economics and Trade, Nanjing Agricultural University, China

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Concept Note - January 2005

Background: The small farm controversy

Agricultural and food markets have, in the past 20 years, dramatically changed to become more integrated, globalized, and consumer driven. Small farms provide the largest source of employment and small businesses among the world's poor, but their roles vary greatly in different regional contexts and stages of development. Small farmers face the challenge of integration and competitiveness in this new environment, while at the same time they are constrained by a drastic reduction in the public provision of basic services as a result of recent policy reforms, market liberalization programs, and fiscal and governance problems.

In Asia and Latin America, these changes are leading to rapid commercialization of farming, but in much of Africa they result in uncertainty and agricultural stagnation. In this context, it is easy to conclude that commercial farming and high-value crops should be the focus of investment for agricultural growth. Yet, this argument misses the numerous examples of successful small farm development around the world and the potential that pro-poor agricultural growth strategies have to slash poverty and hunger.

The question of the future viability of small farms is the subject of an academic and political debate that has gained particular attention lately because many donors and countries have expressed a renewed commitment to the role of agricultural development for growth and poverty reduction. The debate also brings forward the fundamental question of the role of agriculture and its contribution to economic development. Is agriculture the engine of growth? If so, should a pro-poor agricultural growth strategy rely on small farms? How can small farm development contribute to growth and poverty reduction in many of the poorest developing countries?

There is, therefore, a need to better understand the changing context of small farms in view of the recent and often contending research findings on this topic and to highlight, in particular, the differences across countries, regions, and stages of economic development.

Rationale and objectives of the workshop

The future of smallholder farming is an important area of research at the International Food Policy Research Institute (IFPRI) and its partner institutions in the UK: the Overseas Development Institute (ODI) and Imperial College, London. Following a meeting in London in October 2004 of these three institutions, the need was identified for a research workshop focusing on the future of small farms. The workshop would bring together leading experts to review the available evidence by issue and region to:

- delineate and clarify the debate and controversial aspects of it (in the countries and in the literature),
- synthesize areas of agreement and disagreement,
- identify whether remaining controversies and disagreements are a result of knowledge gaps (where further research will be needed) or of other factors (lack of political will or capacity), and
- make research recommendations readily available to a broad range of stakeholders.

The three sponsoring institutions have decided to gather the momentum provided by a number of important British and international events in 2005 to provide analytical substance to the policy discussions. The following events are likely to affect the international policy agenda regarding agricultural development, in particular for Africa:

- G8 and the EU meetings chaired by the UK: The G8 has already expressed its commitment to African agricultural development, and the UK has demonstrated its willingness to retain Africa high on both agendas.
- Millennium Development Goals progress review: The UN will review progress toward the 2015 target to achieve the UN's Millennium Development Goals (MDGs). Africa will be considered off track in meeting the goals.
- Department for International Development's (DFID's) Agricultural Strategy: DFID has been preparing a new strategy document to guide its policy and investment in agricultural development, "New Directions for Agriculture in Reducing Poverty". Following a broad-based consultation, the document is now being finalized. While the document aims at guiding a new policy approach to unlock the potential of agriculture, DFID will be looking at ways to implement this new strategy. (See <http://dfid-agriculture-consultation.nri.org/>)
- Africa Commission: The Commission for Africa was launched by Prime Minister Tony Blair in 2004 to generate effective and innovative action for Africa. Natural resources, agriculture, food security, and environmental management are seen as key to growth and poverty reduction in Africa and are, therefore, recognized as important themes for the commission's work. The commission will also review the contributions made to the DFID Consultation on "New Directions for Agriculture in Reducing Poverty", in particular where reference is made to Africa.

The workshop will take place in June 2005, a date strategically placed between the meetings of the Africa Commission (May 2005) and the G8 (July 2005).

From an IFPRI perspective, there is a need to follow up on the 2020 Africa Conference held in Kampala, Uganda, in April 2004, where the future of small farms emerged as a priority issue.

The timing and focus of the workshop will also be of particular relevance to other development agencies that are in the process of rethinking or revising their agricultural strategies (e.g., the World Bank, U.S. Agency for International Development, and the Poverty Reduction Network (POVNET) group of the Organisation for Economic Co-operation and Development).

Scope of the workshop: key issues

The workshop will be structured around seven issues. A full literature review was undertaken to inform the choice of issues, and a small roundtable discussion took place on December 17, 2004, in London to guide the final choices.

The workshop will address the following core question:

What are the critical economic, institutional, technical, and policy constraints and opportunities facing smallholder farming in the context of global, regional, national, and local economic, political, and agro-ecological conditions in the early 21st century?

Throughout the workshop, the discussions will attempt to highlight the findings from a regional perspective, recognizing that the opportunities and constraints facing small farms are very different in different regions (Asia, Latin America and the Caribbean, Africa, etc.).

Within the framework of this question, the issues and sub-issues that will be considered are as follows.

1. The role of agriculture in pro-poor growth

(a) Agriculture and growth

There is currently growing skepticism in some circles about the future role of agriculture in developing countries. Given declining world prices, the growing diversification of income sources among the poor, and stronger integration of rural and urban economies, there are serious questions about agriculture's potential contribution to growth and poverty reduction. Can agriculture still serve as a major engine of growth in poor countries in Africa, much as it did in Asia in earlier decades? If not, what are the other pathways to growth? These issues need to be addressed first in order to set the scene for any discussion of the future role of small farms.

(b) Traditional versus higher-value agricultural products

A related issue is which types of commodity or subsector investment offer the greatest promise for agricultural growth in poor countries: Should traditional (food staples) or nontraditional and high-value agricultural products (crops, livestock, fisheries) be at the core of an agricultural strategy? Can food staples still serve as an engine of broader economic growth in an age of globalized markets and low and declining world prices? What is the specific role of livestock? How can nontraditional and high-value markets impact poverty in any significant way when they start from a small base and may involve relatively few small farms?

(c) Farm size

Finally, the "small size" controversy will be presented highlighting the question of the development process and pro-poor strategies: How can small farms exist and compete in today's markets? How small can small farms be to remain viable? What happens to the poor as farm size expands and production is modernized or as farms shrink further due to population pressures? What kinds of arguments are provided by economies of scale and transaction costs analysis?

2. Market opportunities: markets, trade, and competitiveness

(a) Markets

What are the major characteristics of agricultural markets today? How do these vary between different areas and agricultural products? How important are export markets for the smallholder sector? What are the institutional arrangements that can link small-scale farmers to local, regional, and international markets? How do consumer preferences and diets drive market changes that affect producers in supply countries?

(b) New supply chains

How are supply chains shaped currently? Can small farms meet the requirements of modern markets? How can they be integrated into new, competitive supply chains? How important is supermarket retailing for smallholder agriculture?

(c) Intermediary institutions (producer organizations, contract farming arrangements)

How can intermediary institutions be developed in a way that allows them to preserve the smallholders' cost advantages in production whilst providing the scale needed to market their produce effectively? Is there a strong correlation between the existence of such intermediaries and poverty reduction? What kind of new management and contracting systems can be designed and put in place so as to increase the efficiency of outgrower models by, in particular, favoring more trustful relationships? How replicable are successful models? What kind of framework can be drawn from case-studies based, in particular, on management, innovation, market linkages, and competitiveness?

(d) Commodities

Which commodities have the greatest growth opportunities for smallholders and in which markets are they? Should smallholders invest only in higher-value crops? How can they be competitive in commodities where access to expensive technology and market information has become necessary?

3. Smallholder farming in difficult circumstances

(a) Less-favored areas

What are the prospects for small farms in areas less favored, owing either to their remoteness, or their low potential in natural resources, or a combination of both? What investments are likely to yield good returns in such cases? What linkages can be put in place between remote and urban areas? What type of farming should be promoted in such areas?

(b) Demographic and health trends

What are the impacts of HIV/AIDS on agricultural and non-farm activities, on the workforce in general and on small farmer households in particular? How can these impacts be mitigated? How can we respond to the needs of a large female agricultural workforce, and of households headed by youths and orphaned children? What are the implications of the disease for agricultural development strategies and the role of small farms? What are the consequences of aging and/or decreasing farm population, urbanization, migration?

(c) Conflict and protracted relief

What can be done for and with small farmers in situations of conflict and of protracted relief? To what extent may well-intentioned relief programmes disrupt farming, for example agricultural markets, with food aid? How can a minimum package of public goods and services to support agriculture be provided in such circumstances? How can recovering states re-construct the agencies and institutions needed to support rural livelihoods with the scant resources they usually command?

4. Employment, migration, and the nonfarm economy

(a) Trends in rural employment

How important is employment in contributing to poverty reduction? What are the respective roles of farm and nonfarm employment in rural economies? What is the role of large farm versus small farm employment in poverty-reduction strategies? Which growth opportunities and employment alternatives exist in the rural nonfarm economy? What will be the consequences of the changes in demographic and social trends (such as urbanization and migration) and in agricultural modernization regarding employment, labor, and rural development, especially for smallholder farming?

(b) Rural non-farm economy

Does rural non-farm economy have the potential to contribute to poverty reduction? What are some of the critical dimensions of rural non-farm economy? What is the nature of growth linkages, if any, between rural non-farm economy and farm economy?

(c) Diversification

What kinds of growth opportunities are likely to exist outside of agriculture for small farmers? Is economic diversification driven by pauperization ("push factors") or economic opportunities ("pull factors")? Does poverty reduction mean that most of the rural poor must exit agriculture altogether? If so, by what processes and over what time scale will this occur?

5. Productivity of small farms: technology and innovation

(a) Technical progress

Will technical progress in small farm productivity be able to keep pace with changes in markets and trade relations? What kind of technical change adapted for small farms is or will be available regarding access to resources and inputs such as water, seeds, fertilizer, and pest management?

(b) Efficiency

Are small farms still the most efficient? What are the determinants of efficiency and competitiveness? What kind of technology can affect small farm efficiency and keep the farms competitive? What factors besides technology affect farmers' efficiency?

(c) Innovation systems

What types of research and development innovation are likely to benefit small-scale farmers (crop science)? What kind of information and management systems can help small-scale farmers manage their agriculture businesses? What types of management innovation can address the need for improvement of the outgrower models? How do small-scale farmers access and develop a culture of innovation and technology? What are the opportunities for rural education systems to facilitate innovation? What are the promising designs for extension to and training of small farmers?

6. Services, institutions, intermediation: new directions

(a) Service delivery

What kinds of institutions affect small farm efficiency and competitiveness in different agro-ecological contexts? Which institutions will be central to the delivery and management of financial services such as credit and equity sharing? What are promising designs for extension to and training of small farmers?

(b) Rural financial intermediation

How can rural financial intermediation, including credit, savings and insurance, be fostered? What services do small farms require? How can the market failures that impede such intermediation be overcome? Which institutions will be central to the delivery and management of financial services such as credit and equity sharing?

(c) Land tenure and distribution

How do land tenure systems affect small-scale farming efficiency? Which systems are most conducive to smallholder farming development? What kind of land reforms and land distribution mechanisms can be established to support poverty reduction strategies?

(d) Intermediary institutions (producer organizations, contract farming arrangements)

How can intermediary institutions be developed in a way that allows them to preserve the smallholders' cost advantages in production whilst providing the scale needed to market their produce effectively? Is there a strong correlation between the existence of such intermediaries and poverty reduction? What kind of new management and contracting systems can be designed and put in place so as to increase the efficiency of outgrower models by, in particular, favoring more trustful relationships? How replicable are successful models? What kind of framework can be drawn from case-studies based, in particular, on management, innovation, market linkages, and competitiveness?

7. Policies and politics for smallholder agriculture

(a) The role of the public sector

What critical public goods are needed for smallholder farming to flourish? Should more public investments be targeted to the problems of small farms, or should they be more neutral with respect to the creation of growth opportunities in rural areas? Should public resources be directly passed on to smallholders through transfer programs, or should they be provided in the form of public goods that enhance growth opportunities? Is there a case for subsidies and state-sponsored food price stabilization?

(b) Governance and decentralization

In a context of decentralization and lesser involvement of the state in the provision of services to small-scale farmers, which institutions are likely to take over these activities?

(c) The role of the private sector and civil society

What should be the respective roles and synergies between the public and the private sector in this changing economic and political environment? What roles should farmer organizations, private companies, and ministries of agriculture play in servicing smallholder farming development? Which mechanisms or institutions can support a better collaboration between these different sectors?

(d) The architecture of public sector action.

How can policy, that supports agriculture in general and small-scale farming in particular, be designed and implemented in line with current initiatives to harmonize public spending with donor funds (as seen in Poverty Reduction Strategy Papers (PRSP), Medium-Term Expenditure Frameworks (MTEF), and the like)? If, as has been suggested, such plans tend to emphasize health, education and infrastructure, while giving to little attention to productive activities, how can this be remedied? How can the image of agriculture as being difficult for governments and donors be countered? Are there innovative and feasible ways to reconcile smallholder development strategies with the evolving frameworks for public spending and aid disbursement?

Structure of the workshop

The workshop will be jointly organized by the International Food Policy Research Institute (IFPRI), through its 2020 Vision Initiative and in close collaboration with the Development Strategy and Governance Division, the Overseas Development Institute (ODI), and Imperial College, London. It will be a residential workshop, and the agenda will provide for three full days of presentations and discussion on the selected key issues.¹ It will take place from June 26 to 29 at the Imperial College Withersdane Conference Centre at Wye, Kent, England.²

On the evening prior to the workshop (Sunday, June 26), participants will be welcomed with an inaugural dinner, during which a background paper will be presented illustrating the rationale and context of the workshop, setting the stage for the issues to be discussed, and highlighting the context and emerging trends of small farms.

The first two and a half days of the workshop will be dedicated to each of the seven issues identified above. At the end of the second day, the participants will attend a dinner, during which three to four speakers will informally reflect on the issues addressed so far and highlight the topics that they perceive to be new and important.

The final session on the third day will be dedicated to synthesizing the main arguments and areas of agreement and disagreement developed during the three days of discussions and drawing policy recommendations. A panel of experts will be asked to work as a team in drawing this synthesis together, ensuring that it captures the flow of discussions and opinions that unfolded during the workshop.

The workshop will have a strong research orientation. It is targeted at 35–50 researchers and practitioners who are experts in their field. A key objective will be to obtain a detailed overview of the main debate taking place in the academic world around the issue of small farms. The workshop will be designed to juxtapose issues and views. In some cases, for instance, two presenters with opposing views will be asked to present on an issue, with a reviewer/discussant attempting to identify common ground and reasons for disagreement.

Each issue session will be broken down into

- one or two presentations by speakers (20–30 minutes each),
- comments from one or two designated discussants, and
- a plenary discussion.

The workshop participants will include

- 12–14 authors writing and presenting technical evidence-based papers as well as the background paper for the inaugural dinner,
- 12–14 discussants presenting their insights after the presentations,
- 10 chairpersons animating the discussions,
- 3–4 after-dinner presenters on day 2 highlighting important issues, and
- 3–4 synthesizers presenting a synthesis of the workshop.

¹ For a detailed description of the workshop program see **Error! Reference source not found.**

² <http://www.imperial.ac.uk/wyecampus/>.

Participants will be selected primarily on the basis of their expertise and contributions to the small farm debate. A reasonable balance will be sought between developed and developing country nationals.

Steering committee

A steering committee is being formed to plan and manage the workshop and will comprise representatives from the three organizing institutions. The composition is as follows:

Peter Hazell
International Food Policy Research Institute
Development Strategy and Governance Division

Rajul Pandya-Lorch
International Food Policy Research Institute
2020 Vision Initiative

Steve Wiggins
Overseas Development Institute
Rural Policy and Governance Group

Colin Poulton
Imperial College London
Centre for Development and Poverty Reduction

Andrew Dorward
Imperial College London
Centre for Development and Poverty Reduction

Expected outputs

1. Synthesis paper
The paper will provide a review of discussions, agreements, and recommendations for policy-makers, as well as knowledge gaps and priorities for future research. It will be prepared by a team of authors, who are different from those who provide synthesis comments toward the end of the workshop. The synthesis will provide the basis for several outreach events to follow the workshop, including press releases and perhaps an article on the future of small farms in *The Economist* or major newspaper.
2. Policy statement
A two-page brief based on the synthesis will highlight the main points of agreement, the final messages of the workshop, and the main policy recommendations. Again, this will be used for follow-up activities and press briefings.
3. Discussion paper with the workshop proceedings
The collection of papers presented during the workshop will be compiled as a 2020 Discussion Paper, also available on IFPRI's website.
4. Journal articles based on workshop papers
Selected papers will be published as a special issue in an academic journal.³
5. Policy seminar(s)
The three organizing institutions will take the lead in organizing follow-up policy seminars with partners to present the results of the discussions and the draft synthesis to important stakeholder groups. It is expected that half-day to one-day seminars will take place in Africa, in the UK (London), and in the United States (Washington D.C.), and possibly in South Asia, and in Latin America later.

³ Food Policy and the Journal of Development Economics (JDE) have been envisioned.

Time frame

December 17, 2004	First meeting of the steering committee
January 2005	Finalization of the concept note
	Finalization of the draft program
	Preparation of terms of reference for resource persons
	Identification of authors and participants
February 2005	Second meeting of the steering committee
	Invitations to all participants
March–June 2005	Communication activities
May 2005	Deadline for paper submission
June 2005	Workshop
July 2005	Preparation of synthesis paper and policy statement
July–October 2005	Preparation of workshop proceedings and journal articles
Fall–Winter 2005	Policy seminars and other follow-up activities

Contact information

International Food Policy Research Institute

2033 K Street, NW
Washington, DC 20006-1002
USA
Phone: +1 202-862-5600
Fax: +1 202-467-4439
Peter Hazell: p.hazell@cgiar.org
Rajul Pandya-Lorch: r.pandya-lorch@cgiar.org
<http://www.ifpri.org>
<http://www.ifpri.org/2020/about.htm>

Overseas Development Institute

111 Westminster Bridge Road
London SE1 7JD
UK
Steve Wiggins: S.Wiggins@odi.org.uk
<http://www.odi.org.uk>

Imperial College, London

Centre for Development and Poverty Reduction
Wye Campus, Ashford, Kent, TN25 5AH, UK
Phone: +44 (0)20-7594-2968
Colin Poulton: C.Poulton@imperial.ac.uk
<http://www.imperial.ac.uk/agriculturalsciences/research/centres/cdpr.htm>

Small farms: Current Status and Key Trends

Information Brief

Oksana Nagayets

Prepared for the Future of Small Farms

Research Workshop

Wye College, June 26–29, 2005

The question of the future viability of small farms is the subject of academic and political debates that have gained particular attention in recent years. Such debates are driven, in part, by renewed commitment by many countries and donors to explore the role of agricultural development for growth and poverty reduction. At the same time, increasingly integrated, globalized, and consumer-driven agricultural and food markets require smallholders to adapt to a new environment. Small farmers face the challenge of integration and competitiveness in new markets, but at the same time they are constrained by drastic reductions in the provision of basic public services as a result of recent policy reform, market liberalization, as well as budgetary and capacity limitations.

Definition of Small Farms

The concept of small farms can be approached from a variety of angles. Small-scale agriculture is often, albeit not always appropriately, used interchangeably with smallholder, family, subsistence, resource-poor, low-income, low-input, or low-technology farming (Heidhues and Brüntrup 2003). The following examples of definitions illustrate the diversity of conceptual approaches to the term:

- Lipton defines family farms as “operated units in which most labor and enterprise come from the farm family, which puts much of its working time into the farm” (2005);
- The World Bank’s Rural Strategy defines smallholders as those with a low asset base, operating less than 2 hectares of cropland (World Bank 2003);
- A recent FAO study defines smallholders as farmers with “limited resource endowments, relative to other farmers in the sector” (Dixon, Taniguchi, and Wattenbach 2003);
- Narayanan and Gulati characterize a smallholder “as a farmer (crop or livestock) practicing a mix of commercial and subsistence production or either, where the family provides the majority of labour and the farm provides the principal source of income” (2002).

The sole consensus on small farms may be the lack of a sole definition. As a result, the issue spans “a widely diversified group from middle class family businesses well-integrated into the market economy to subsistence farmers, who constitute almost 75 percent of the world’s poor” (Huvio, Kola, and Lundström, eds. 2005). To underscore this point, consider that various agencies in the United States categorize small farms using agricultural sales cutoffs of \$50,000, \$250,000, or even \$500,000 (Economic Research Service, Small Business Administration, and National Commission on Small Farms, respectively [ERS 2005]). According to the \$500,000 threshold, 97 percent of U.S. farms fall into the small farm category.

The most common approach—adopted in this paper and driven by availability of internationally comparable empirical data—is to define small farms on the basis of the size of landholding (or livestock numbers). It is important, however, to recognize the limitations of this measure, given that it fails to properly account for the quality of resources, the types of crops grown, or disparities across regions. For example, a small farm in Latin America that produces high-value crops in an irrigated area is hardly comparable with a small farm in South Asia producing a staple crop in a marginal or rainfed area. The size-based definition also precludes analysis or comparison of institutional and market arrangements available to farmers, which play a critical role in determining their income opportunities as well as their access to key social services, such as health and education. Further, the size-based definition does not shed light on a farm’s labor arrangements, such as relative shares of family and hired labor, which can also have substantial implications for the farm’s efficiency and productivity. With these criticisms in mind, in this paper the terms small farms and smallholders are confined to farms of less than 2 hectares of

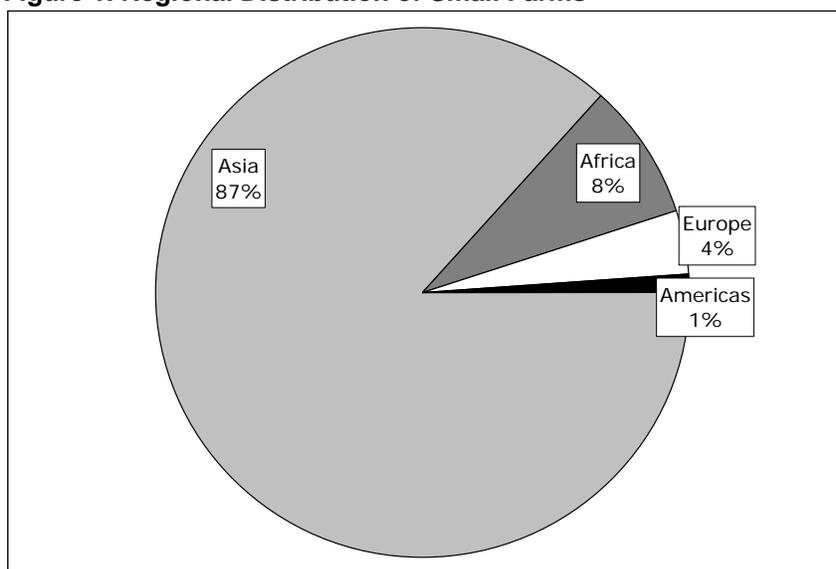
The author is a Research Analyst within the 2020 Vision for Food, Agriculture, and the Environment Initiative at the International Food Policy Research Institute (IFPRI). She gratefully acknowledges very helpful comments on earlier drafts by Rajul Pandya-Lorch, Peter Hazell, and Morgane Danielou.

owned or rented land. This definition also assumes that the farm family provides the primary source of labor and that farming constitutes a principal source of income for the family.

Number of Small Farms

There are approximately 525 million farms worldwide, though small farm data are only available for 470 million. Of these, smallholders who operate plots of land of less than 2 hectares currently constitute 85 percent. The overwhelming majority of these farms are located in Asia (87 percent), while Africa is home to another 8 percent, and Europe to approximately 4 percent (Figure 1). In Asia, China alone accounts for almost half the world's small farms (193 million), followed by India with 23 percent. Other leaders in the region, in descending order, include Indonesia, Bangladesh, and Viet Nam (Table 1).

Figure 1. Regional Distribution of Small Farms



Sources: Calculated by author based on FAO (2001, 2004) and data from national statistical agencies (details of which are available from the author on request).

Note: Small farms are defined as those of less than 2 hectares. The total number of small farms is 404 million.

Africa has approximately 33 million small farms, representing 80 percent of all farms in the region. It is important to mention, however, that data for Africa are particularly scarce. Data on small farms are available for less than half of all African countries, while for many Agricultural Census data have not been collected since the 1960s or 1970s. Existing data suggest that small farms are most prolific in Ethiopia, followed in descending order by Nigeria, the Democratic Republic of Congo (DR Congo), Tanzania, and Egypt (Table 1).

Europe contains almost 16 million small farms, predominantly located in Central and Eastern Europe. Russia, included in Europe based on UN categorizations, contributes another 16 million farms of less than 1 hectare. Von Braun and Lohlein (2003) estimate that about 41 million subsistence farms of this size are located in Central and Eastern Europe and the countries of the former Soviet Union (FSU). Since the collapse of the Soviet Union and the subsequent shift, through land reform, away from collective farming, these subsistence plots have grown to represent over 95 percent of all farms and contribute a major share of the region's food production.

Table 1. Top Five Countries with the Largest Number of Small Farms, By Region

Country	Census year	Number of farms under 2 hectares	Share of farms under 2 hectares, percent
Asia			
China	1997	189,394,000	98
India	1995–96	92,822,000	80
Indonesia	1993	17,268,123	88
Bangladesh	1996	16,991,032	96
Viet Nam	2001	9,690,506	95
Africa			
Ethiopia	2001–02	9,374,455	87
Nigeria	2000	6,252,235	74
DR Congo	1990	4,351,000	97
Tanzania	1994–95	2,904,241	75
Egypt	1990	2,616,991	90
Americas			
Mexico	1991	2,174,931	49
Peru	1994	1,004,668	58
Brazil	1996	983,330	21
Ecuador	1999–2000	366,058	43
Venezuela	1996–97	113,421	23
Europe			
Russia ^a	2002	16,000,000	98
Ukraine	2003	6,214,800	99
Romania	1998	2,279,297	58
Bulgaria	1998	1,691,696	95
Poland	2002	1,494,100	51

Sources: Calculated by author based on FAO (2001, 2004) and data from national statistical agencies (details of which are available from the author on request).

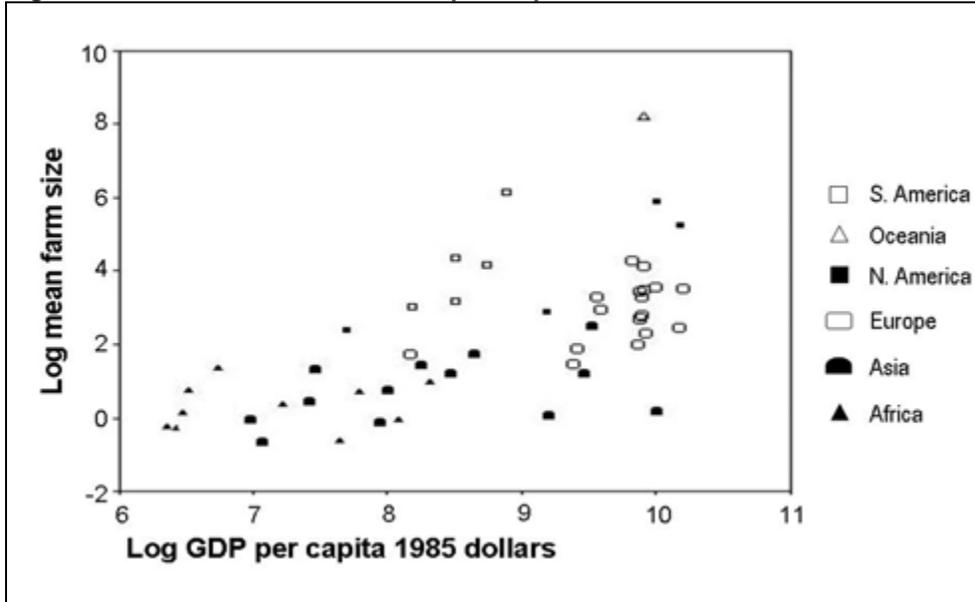
^a Data are based on farm size of less than 1 hectare.

Recent Trends in Farm Size

Historical trends suggest that small farmers will continue to dominate the agricultural landscape in the developing world, especially in Africa and Asia, for at least the next two to three decades. In the longer run, the process of economic development will increase per capita incomes, diversify economic opportunities, and allow agricultural workers to leave farming in order to pursue employment opportunities in other sectors of the economy. Until the transition unfolds and alternative sources of livelihoods emerge in urban areas and in the rural nonfarm sector, policymakers must also take steps to help smallholders. Recent evidence, for example, Eastwood, Lipton, and Newell (2004), suggests a positive relationship between average farm size and the level of economic development, as represented by GDP per capita (Figures 2 and 3, Table 2). Historical trends from developed countries show that the size of farms

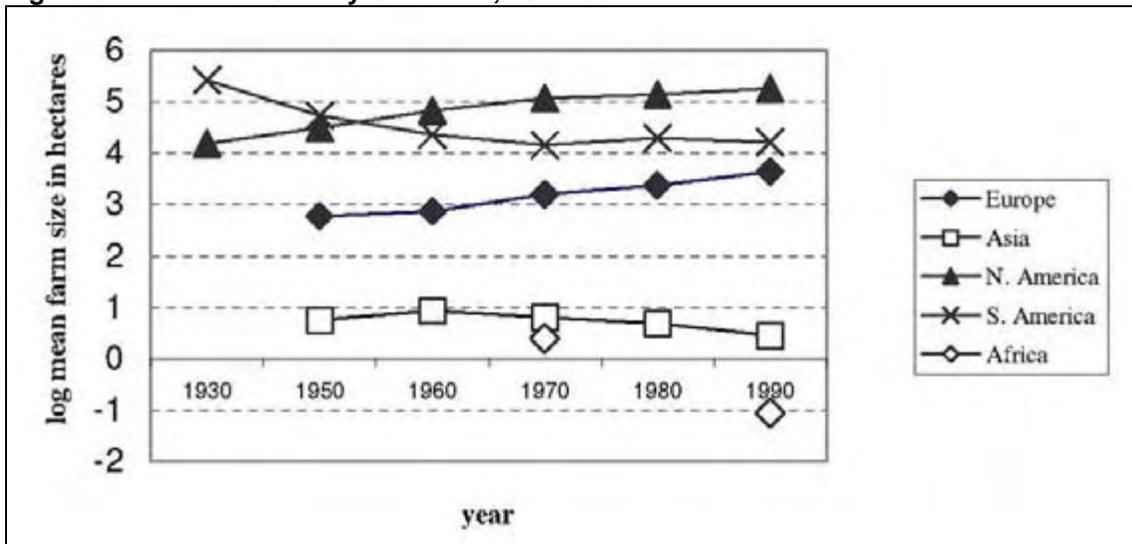
increased during the second half of the 20th century, while the number of small farms decreased (Figures 3 and 4, and Table 3). In the United States, the average farm size has grown from 157 hectares in 1969 to 178 hectares in 2002, peaking at almost 200 hectares in the mid-1990s. Similar trends can be observed in the United Kingdom, where the average farm size grew from 55 to 70 hectares during 1970–93. Farm size in North America currently averages 121 hectares, and in Western Europe it averages 27 hectares (Table 2).

Figure 2. Mean Farm Size and GDP per Capita, 1990



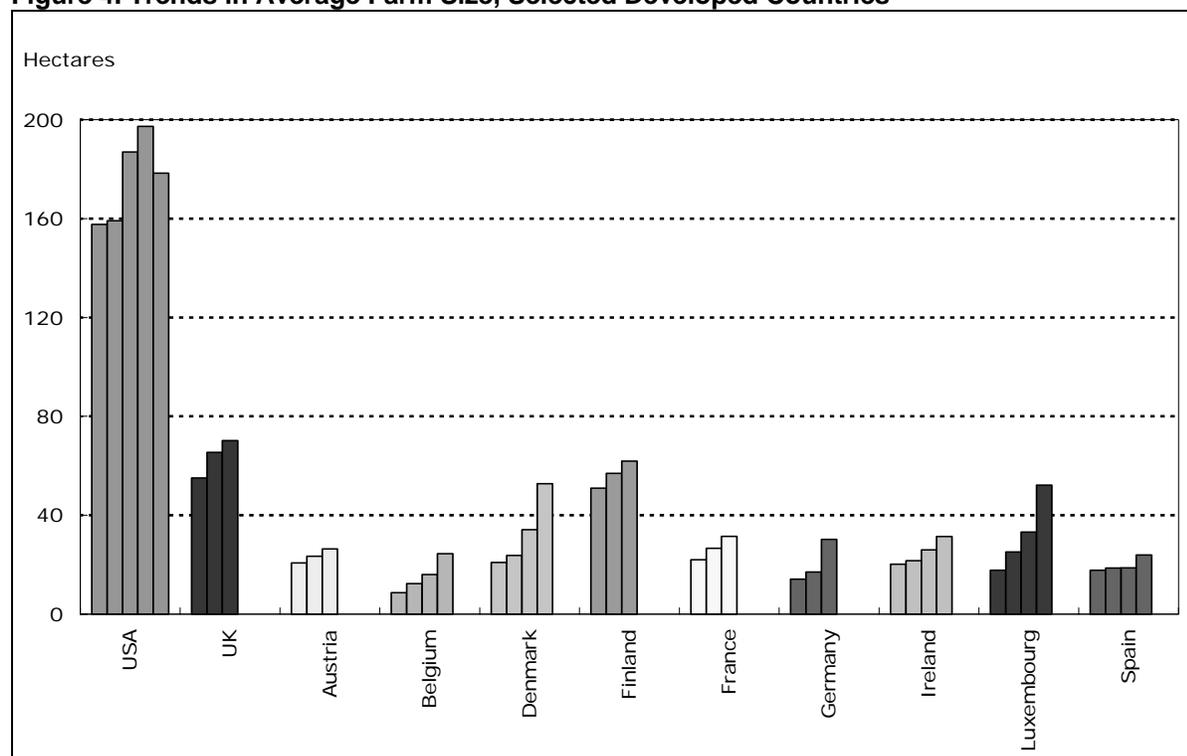
Source: Eastwood, Lipton, and Newell 2004.

Figure 3. Mean Farm Size by Continent, 1930–90



Source: Eastwood, Lipton, and Newell 2004.

Figure 4. Trends in Average Farm Size, Selected Developed Countries



Source: FAO 2001, 2004.

Note: The data for Figure 4 is contained in Table 3.

Table 2. Approximate Farm Size by World Region

World region	Average farm size, hectares
Africa	1.6
Asia	1.6
Latin America and Caribbean	67.0
Europe ^a	27.0
North America	121.0

Source: von Braun 2005.

^aData include Western Europe only.

Table 3. Trends in Average Farm Size and Number of Small Farms

Country	Census year	Average farm size, hectares	Total area of holdings, hectares	Number of farms under 2 hectares
Selected developed countries				
United States	1969	157.6	430,321,000	108,370
	1979	159.1	394,061,235	na
	1987	187.0	390,311,617	na
	1997	197.2	377,088,222	66,012
	2002	178.4	379,712,151	na
United Kingdom	1970	55.1	17,992,312	na
	1979	65.4	17,568,330	na
	1993	70.2	17,144,777	na
Austria	1969	20.7	7,490,463	75,840
	1980	23.5	7,325,863	54,548
	1990	26.7	7,217,498	38,694
Belgium	1970	8.7	1,602,864	68,981
	1979	12.4	1,475,140	35,835
	1990	16.1	1,400,364	20,083
	2002	24.5	1,392,691	na
Denmark	1970	21.0	2,941,316	na
	1979	23.8	2,919,721	na
	1989	34.1	2,774,127	na
	2002	52.8	2,665,507	na
Finland	1970	51.0	15,150,223	33,573
	1980	57.0	12,800,326	20,673
	1990	61.9	12,338,439	27,114
France	1971	22.1	35,039,217	282,592
	1989	31.5	31,985,606	150,933
Germany	1971	14.2	15,236,139	195,198
	1995	30.3	17,156,900	90,600
Ireland	1991	26.0	4,441,755	4,460
	2000	31.4	4,443,071	3,130
Luxembourg	1970	17.8	135,143	1,175
	1980	25.1	130,061	807
	1990	33.2	126,298	523
	2001	52.2	137,664	324
Spain	1972	17.8	45,702,620	1,026,504
	1982	18.7	44,311,769	988,591
	1989	18.8	42,939,208	1,010,280
	1999	23.9	42,180,951	na

Table 2. Continued

Country	Census year	Average farm size, hectares	Total area of holdings, hectares	Number of farms under 2 hectares
Selected developing countries				
DR Congo	1970	1.5	3,821,916	2,026,740
	1990	0.5	2,387,700	4,351,000
Ethiopia	1977	1.4	6,862,200	3,675,500
	1989–92	0.8	4,871,020	5,620,140
	2001–02	1.0	11,047,249	9,374,455
China	1980	0.6	na	na
	1990	0.4	na	na
	1999	0.4	na	na
India	1971	2.3	162,124,000	49,114,000
	1991	1.6	165,507,000	84,480,000
	1995–96	1.4	163,357,000	92,822,000
Indonesia	1973	1.1	16,394,000	12,712,791
	1993	0.9	17,145,036	17,268,123
Nepal	1992	1.0	2,598,971	2,407,169
	2002	0.8	2,654,037	3,083,241
Pakistan	1971–73	5.3	19,913,000	1,059,038
	1989	3.8	19,149,637	2,404,057
	2000	3.1	20,437,554	3,814,798
Philippines	1971	3.6	8,494,000	963,738
	1991	2.2	9,974,871	2,999,076

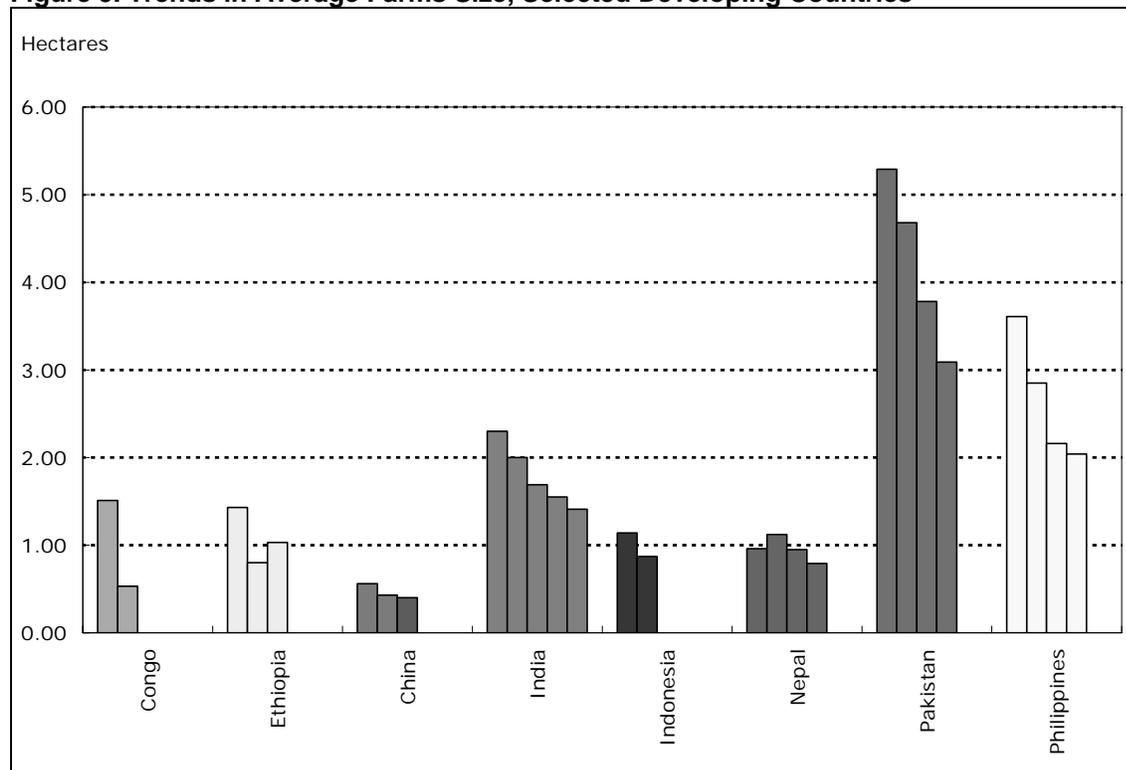
Source: Calculated by author based on FAO (2001, 2004). Data for China are from Fan and Chan-Kang (2003).

Note: na indicates that data were not available.

Evidence from Africa and Asia suggests that, despite steady economic growth in many Asian countries over recent decades, small farms still dominate in rural areas. According to the 1990 FAO World Agricultural Census (FAO 2001), as of the mid- to late 1990s farm size averaged 1.6 hectares in both Africa and Asia (Table 2), while in Latin America it averaged 67 hectares, reflecting highly unequal land distribution rather than advances in economic development. In fact, land holdings are becoming increasingly subdivided, suggesting that agriculture is absorbing the rising population (Figure 5). In Africa, for instance, the average size of landholdings shrank from 1.5 hectares in 1970 to 0.5 hectares in 1990 in DR Congo, at which time 62 percent of all farm households operated land holdings of less than 0.5 hectares. Further, the total number of small farms in DR Congo more than doubled during this time. In Lesotho, decreases in average farm size were accompanied by a 40 percent increase in the total number of small farms during 1970–90, and by a further increase of 70 percent over the following decade.

Similar trends can be observed in Asia. In China, average farm size decreased from 0.56 hectares in 1980 to 0.4 hectares in 1999 (Fan and Chan-Kang 2003); in Pakistan, it steadily declined from 5.3 hectares in 1971–73 to 3.1 hectares in 2000, during which time the number of small farms more than tripled; in the Philippines, average farm size fell from 3.6 hectares in 1971 to only 2 hectares in 1991; and in India, it decreased from 2.2 hectares in 1950, to 1.8 hectares in 1980, to 1.4 hectares in 1995–96.

Figure 5. Trends in Average Farms Size, Selected Developing Countries



Sources: Calculated by author based on FAO (2001, 2004). Data for China are from Fan and Chan-Kang (2003).

Note: Data for Figure 5 are contained in Table 3.

Land Distribution

The prevalence of small farms in the developing world can be seen from their share of total farm households (Table 4). But inequitable land distribution in many countries means that the number of small farms usually does not equate with the share of total agricultural land. The most recent Agricultural Census for India (1995/96) indicates that 80 percent of farm households cultivate only 36 percent of total agricultural area. In Pakistan, 58 percent of all farmers fall into the smallholder category, but they cultivate only 15 percent of total agricultural land. Similar—though less dramatic—trends are also evident in Africa. In Egypt, three-quarters of all farmers are small farmers but they cultivate less than a half of all land. In Uganda, where a proportion of smallholders is comparable to Egypt, small farmers cultivate only 27 percent of all land. Unequal land distribution is especially prominent in Latin America. Smallholders in Ecuador, for example, constitute 43 percent of all farmers but cultivate only 2 percent of the land, and in Brazil only 20 percent of all farmers are smallholders, but their share of total land is less than 1 percent. In Eastern Europe, 51 percent of Poland's small farmers cultivate only 7 percent of the land, while in the Ukraine, small farms—which constitute 99 percent of all farms—cultivate only 8 percent of all agricultural land (World Bank/OECD 2004).

Table 4. Small Farms as a Share of Total Number of Farms and Total Cultivable Area

	Egypt 1990 ^a	Ethiopia 1999/2000	DR Congo 1990	Uganda 1991	Bangladesh 1996	India 1995/1996	Indonesia 1993	Nepal 2002	Pakistan 2000	Brazil 1996	Ecuador 1999/2000	Panama 2001 ^b	Georgia 1998	Poland 2002	Romania 1998	Russia 2002 ^b	Ukraine 2003
Number of small farms as a share of total farms (percent)	75	87	97	73	95	80	88	92	58	20	43	53	96	51	58	98	99
Share of total area cultivated by smallholders (percent)	49	60	86	27	69	36	55	69	15	0.3	2	0.6	33	7	14	3	8

Source: FAO 2001, 2004; Tanic 2001, Goskomstat 2002, World Bank/OECD 2004.

^a Under 2.1 hectares.

^b Under 1 hectare.

Production Shares of Small Farmers

Small farmers account for a sizable share of agricultural production and in many instances their contribution is growing. In India, for example, smallholders were contributing over 40 percent of foodgrain production in 1990-91 (compared with only a third of the total in 1980), as of the late 1990s they owned the majority of livestock, and were dominating the dairy sector (Narayanan and Gulati 2002). In Kenya, the share of national agricultural production contributed by smallholders increased from 4 percent in 1965 to 49 percent in 1985 (Lele and Agarwal 1989, cited in Machethe 2004). Malawian small farmers account for 85 percent of total agricultural production (MOI Undated) while dairy smallholders in Ethiopia contribute 97 percent of total national milk production and three-quarters of commercial milk production (Ahmed, Ehui, and Assefa 2004). According to Spencer, 90 percent of all agricultural production in Africa is derived from small farms (2002).

In Eastern Europe, subsistence farmers have played a key role in ensuring food security in the region during the transition period from collective to private farming. Russian smallholders produced 52 percent of total agricultural production in 2001, compared with only 26 percent just a decade ago (Goskomstat 2002). Data on shares of small farmers—typically operating less than 1 hectare of land—in producing selected agricultural products is presented in Table 5.

Table 5. Share of Small Farms in Agricultural Production, Selected Former Soviet Union Countries, Percent

Country	Milk	Meat	Vegetables	Fruit	Potatoes	Eggs
Kazakhstan, 1997	12	68	na	na	na	53
Kyrgyzstan, 1997	5	76	na	na	na	1
Moldova, 1998	84	na	71	48	99	57
Russia, 2001	51	57	80	na	93	28
Ukraine, 2001	73	76	87	86	98	62
Uzbekistan, 1997	68	90	na	na	na	46

Sources: Dumitrichko 2001; Seperovich 2002; Goskomstat 2002; Suleimenov 2000.

Note: na indicates that data were not available.

Income Shares of Smallholders

Smallholder income derived through the sale of surplus farm produce is frequently supplemented by nonfarm income. A recent study conducted in South Africa estimates that farming activities generate only about 40 percent of total smallholder incomes, while nonfarm sources account for the remainder, including remittances and wages representing 12 and 19 percent, respectively (Machethe et al. 2004). A recent study by Jayne et al. (2003, Table 6) estimates that in Zambia, 27 percent of smallholder income is derived from off-farm activities, while in Kenya 40 percent is derived from nonfarm sources, such as remittances (7 percent), business income (12 percent), and wage labor (21 percent). The diversity of income sources for smallholders can also be found in FSU countries. In Georgia, for example, 57 percent of small farm income is derived from the sale of agricultural products, supplemented by contractual employment, remittances, and pension payments (Kegel 2003). Similarly in South Asia, rural nonfarm income accounts for approximately 30 to 40 percent of total smallholder income, while in Southeast Asia this share may be as high as 45 percent (DFID/ODI/NMFA 2002).

Table 6. Smallholder Sources of Income in Selected African Countries, Percent

Country	Household per capita income (U.S. dollars)	Crop income share	Livestock production income share	Share of off-farm income, of which:	Remittances	Business income	Salary or wages
Kenya	336.7	34.0	26.0	40.0	6.7	12.3	21.0
Ethiopia	71.6	91.9	na	8.1	na	na	na
Rwanda ^a	78.7	70.3	4.9	24.8	3.4 ^b	5.9	15.6
Mozambique ^c	43.1	84.5	2.8	12.7	na	10.5	2.2
Zambia	62.9	67.2	4.4	28.4	5.2	13.8	9.4

Source: Jayne et al. 2003.

Note: na indicates that data were not available. All data are weighted, except for Kenya, where weights were not available.

^a Income data include gross income derived from crop production on rented land.

^b Gifts received rather than remittances.

^c Where available, income data are for North-Central Mozambique only.

Poverty and Small Farmers

Despite the volume of production that smallholders generate and the variety of additional sources of income they draw on, small farmers—in addition to the landless and urban poor—are among the most disadvantaged and vulnerable groups in the developing world. Half of all undernourished people in the world, three-quarters of Africa's malnourished children, and the majority of people living in absolute poverty can be found on small farms (Millennium Project Task Force on Hunger 2004, 2005; IFAD 2001). Individual country- and household-level case studies confirm these generalized findings. Jayne et al. (2003) established that of the share of surveyed smallholder households falling below the poverty line was 55 percent in Kenya, 75 percent in Ethiopia, and a staggering 97 percent in Mozambique (Table 7). Recent research in India shows that the incidence of hunger among those farmers whose landholdings are less than 0.5 hectares is 32 percent and the incidence of poverty is 38 percent; the likelihood of being affected by hunger or poverty drops to 12 and 13 percent, respectively, for those farmers who cultivate more than 4 hectares of land (Singh 2004).

Table 7. Smallholder Income and Poverty in Selected African Countries

Country	Average land access per household (hectares)	Household per capita income (U.S. dollars)	Nonfarm share of household per capita income (percent)	Poverty headcount (percent)	Poverty line (U.S. dollars)	Poverty gap (ratio)
Kenya, 1997	2.65	336.9	40.0	55.2	256.3	0.3
Ethiopia, 1995	1.17	71.6	7.3	75.1	97.4	0.4
Rwanda, 1990	0.94	78.7	24.8	na	na	na
Mozambique, 1996	2.1	43.1	12.7	97.1	170	0.8
Zambia, 2000	2.76	57.7	27.3	na	na	na

Source: Jayne et al. 2003.

Note: na indicates that data were not available. Data for Ethiopia, Rwanda, Mozambique, and Zambia are weighted. Data for Kenya are sample statistics.

Many of the forces shaping the future of small farms can be harnessed to propel small farmers to higher standards of living by both stimulating productivity increases and opening up promising new markets. Against the overall discouraging backdrop of actual impacts, there are refreshing exceptions throughout the developing world which indicate that advances in productivity and income levels can be achieved. Capitalizing on renewed political will by turning challenges into opportunities for small farmers could transform smallholder agriculture from “the parking lot for the poor” and into an engine of growth.

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The Future of Small Farmers

Answers to the spontaneous questionnaire/survey

Wye, Monday, June 27, 2005

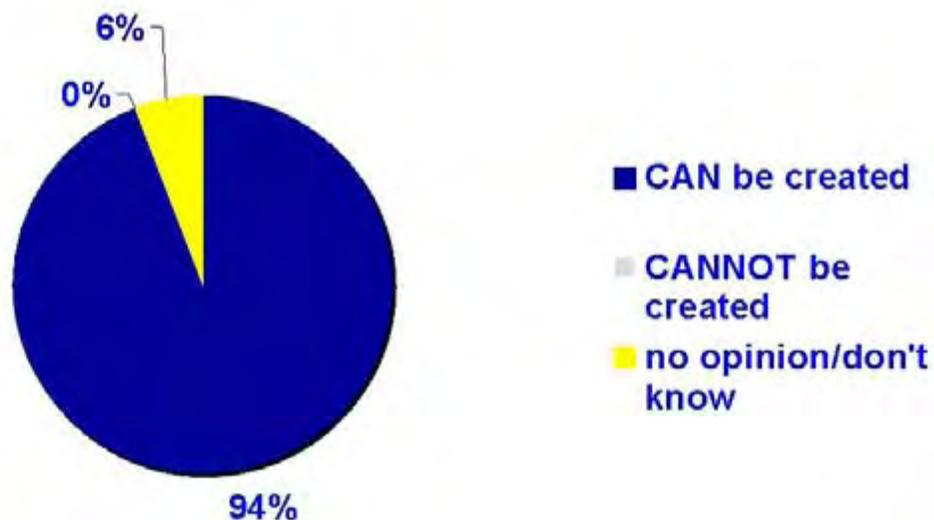
Key Issues/Questions

- How to reduce risks/vulnerability (shocks) incl. human health risks (8)
- Impact/role of supermarkets and speed of their domination (8)
- Definition and stratification of small farmers (8)
- Role/understanding of agricultural sector in pro poor growth (8)
- Synergies/roles of public and private sector (4)
- Innovative institutional arrangements and services (4)
- How to create/transfer/redistribute assets/capital (4)
- Impact of climate change (3)
- Give farmers a voice/lobby to engage, participate and influence (3)
- Relevance and appropriateness of "pro-staples" (price) policy (favor to a minority) and access to staples markets (3)
- Role/impact of migration, labor dynamics and remittances (3)
- Variations between regions and stages of growth (2)
- Not much new research; act on what we know (2)
- Track and monitor political attitude to agriculture (2)
- Dismantle OECD subsidies that are a constraint/target subsidies (2)
- Horizontal cooperation (2)
- Access to high value markets
- Why do econometric multipliers not explain what actually happens?

Key Issues/Questions

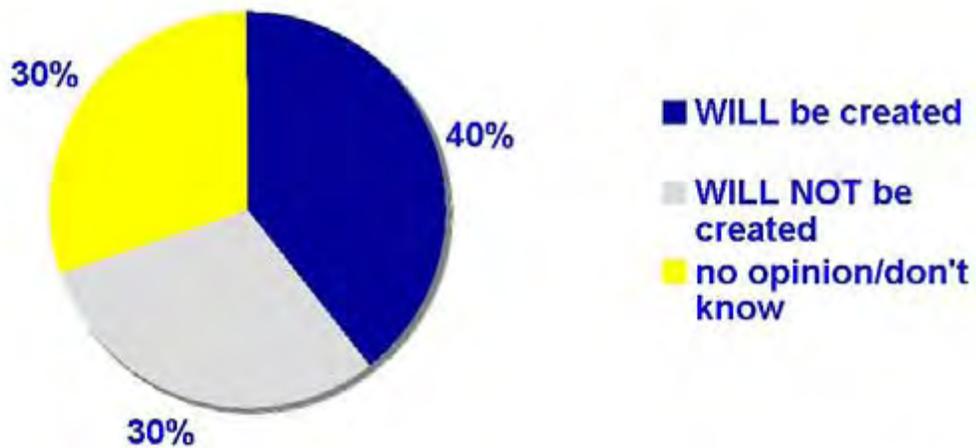
- Quantify transaction costs
- Role of small processors
- Process of small farm consolidation
- More explicit targeting farm/non-farm in LFA
- Macro-economic and budget questions to stimulate ag productivity
- Role of uncompensated labor?
- Address management of production and environment during transitory period
- Dynamics of operational and ownership structure of land
- HIV/AIDS
- Food security strategies
- Does "the smallholders story" cover the whole picture?
- Necessary conditions for ag growth?
- Ag growth necessary to transform ag?
- Policy framework for smallholder agriculture
- Viability of small farmers a contradiction to ag transformation?
- Improve incentives
- Impact of roads
- Productivity/competitiveness small vs. large
- More focus on livestock
- More investment in ag sector
- Equity incl. gender

A viable future for the small farmers...



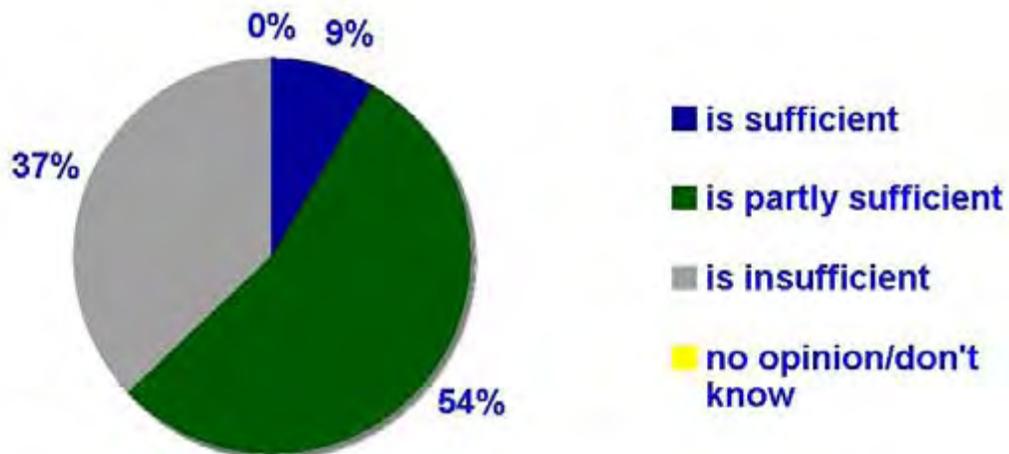
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A viable future for the small farmers...



n = 33

To advise policymakers, our current research on small farmers...



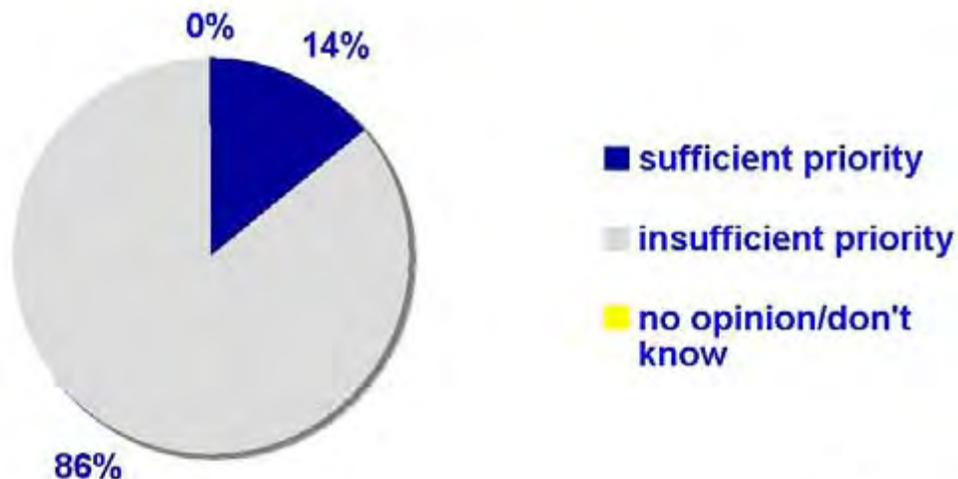
n = 35

The private sector will influence the future of small farmers much more than the public sector...



n = 35

In the public debate, the future of small farmers has...



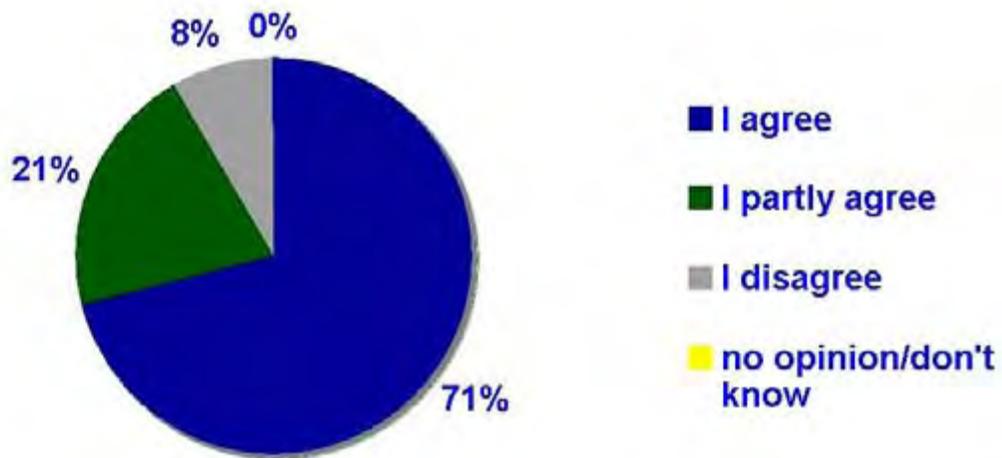
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The Future of Small Farmers

Answers to the spontaneous questionnaire/survey

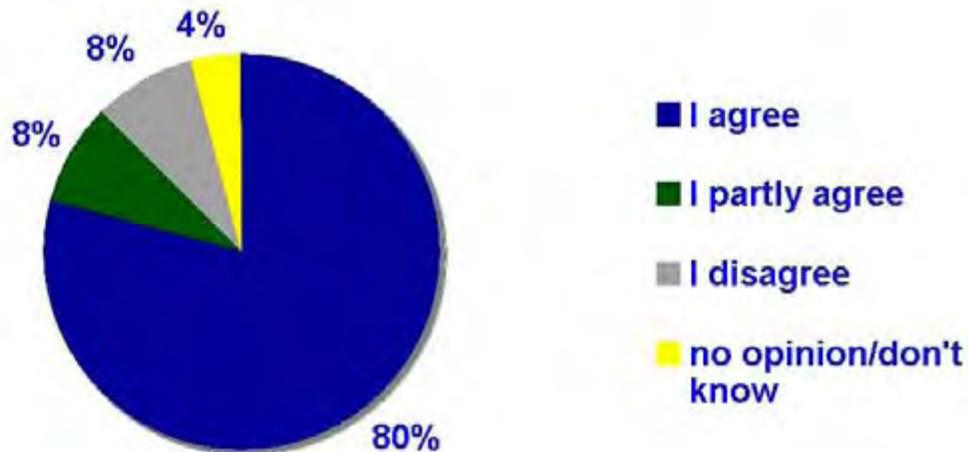
Wye, Tuesday, June 28, 2005

Transgenic crops are a valid option that should also be made available to small farmers...



n = 24

Low state capacity and problems of public sector governance are a major obstacle to increasing agricultural investment in Africa ...



n = 24

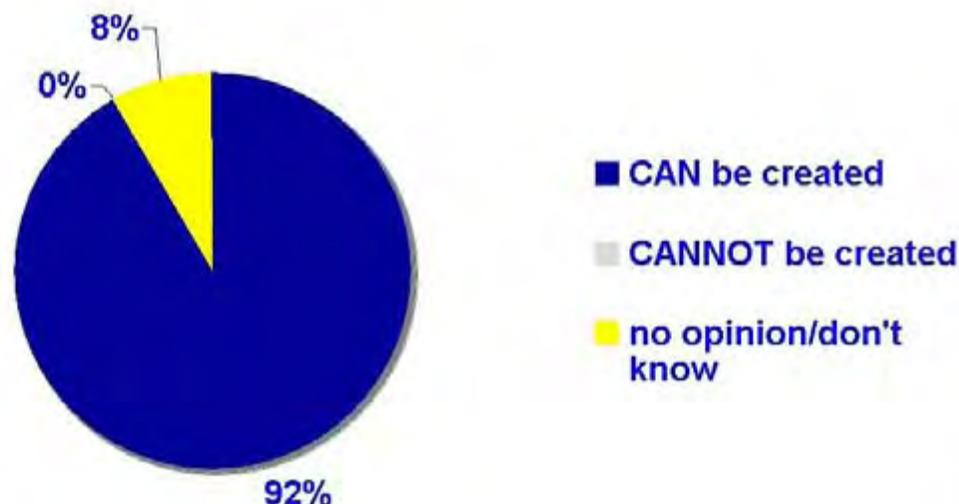
Actions as a policymaker

- **Invest in public/rural infrastructure, public goods, electricity, health, access to safe water, maintenance capacity, public transportation (17)**
- **Rapidly reform (increase efficiency) ministry of agriculture/NARS; invest in R&D, improve governance, legal systems, increase share of ag budget (12)**
- Reform land tenure and property rights (special focus on women) (4)
- Put money into promotion of farmer/producer organizations, establish farmer voice (4)
- Capacity strengthening, ag education, training and adult literacy programs (3)
- Remove policies that favor large farms, address market access problems, establish market councils (3)

Actions as a policymaker

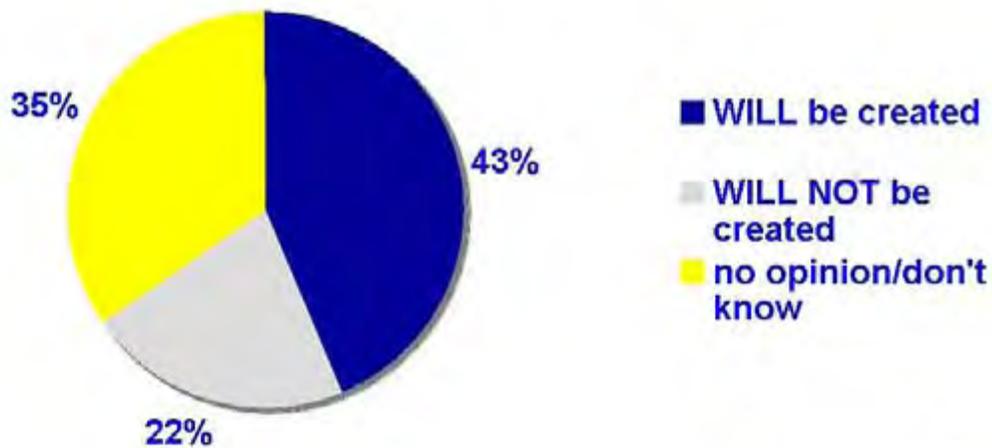
- Public private partnerships (for service delivery) (3)
- Independently governed micro finance institutions, price support, credits (2)
- Competitive exchange rates, interest rates, taxes that allow enough revenues; improve incentive systems for farmers (2)
- Identify 2-3 key farm commodities, supply chain analysis with industry, identify necessary upstream interventions (2)
- Develop and transfer info and technologies to small farms (follow-up) (2)
- Targeted subsidies to smallest farmers (2)
- More contextual studies
- Focus public expenditures on labor-intensive sectors to facilitate migration
- Focus on labor intensive agriculture
- Donors should launch a major effort to revitalize African agriculture at a scale and for a long period of time to make a difference
- Mainstream the youth into agriculture
- Promote competitive value chains
- Provide safety nets for those who are left out
- Challenge funds to facilitate supermarket chain intermediation and foster spirit of competitiveness
- Analyze specific constraints, avoid 1-size-fits-all prescriptions; get much better understanding of socio-economic and cultural issues behind productivity and vulnerability
- In SSA, address HIV/AIDS from agricultural/rural productivity point of view
- Target rich countries ag subsidies
- One-year expert review of water supply and demand and impact on poverty; then action

A viable future for the small farmers...



n = 24

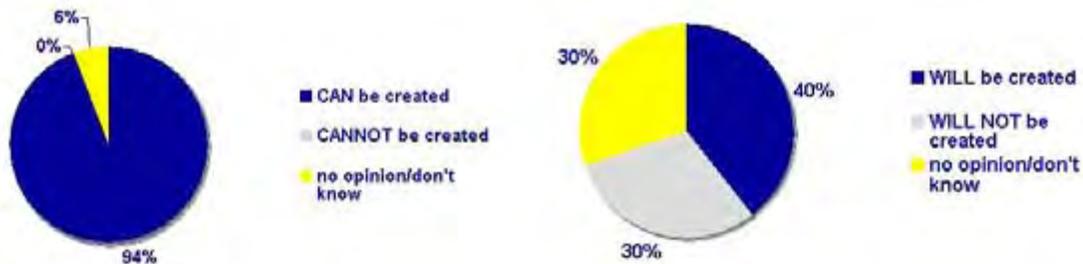
A viable future for the small farmers...



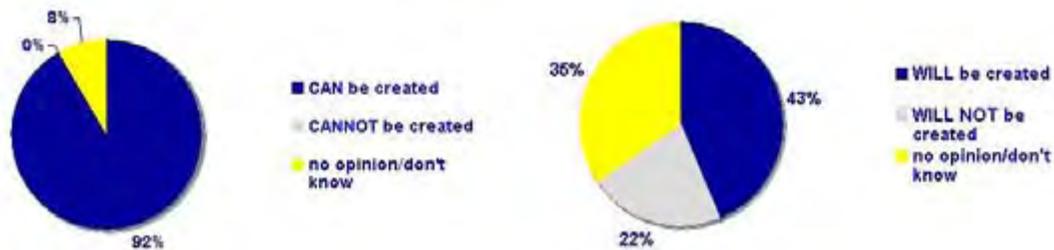
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A viable future for the small farmers...

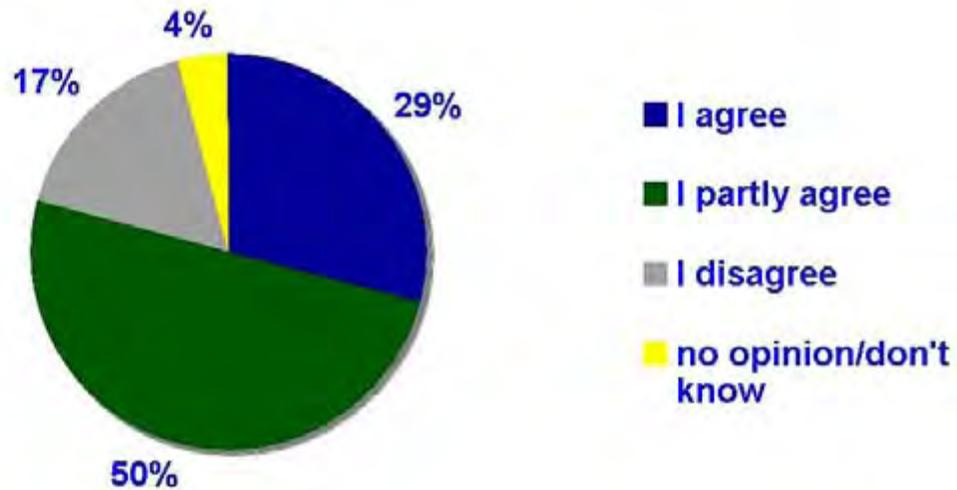
Survey June 27, 2005: n = 34



Survey June 28, 2005: n = 23/24

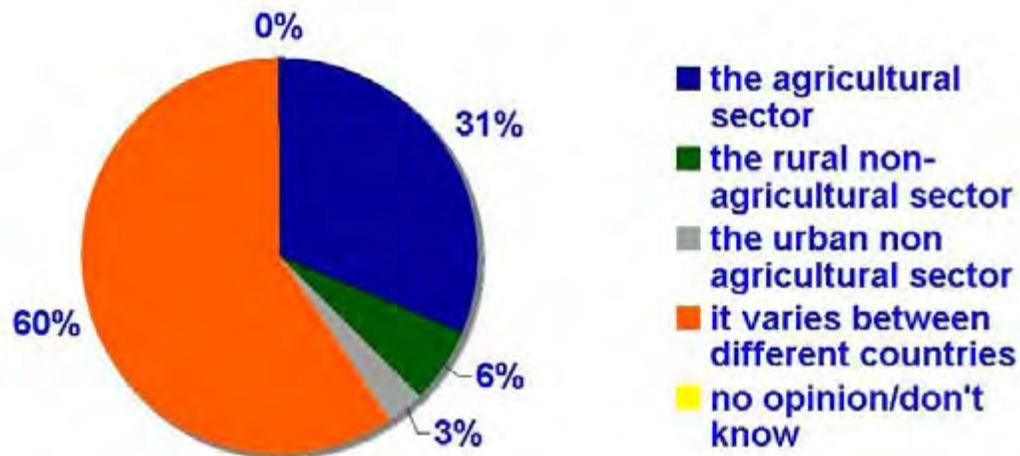


Current research is focusing too much on the rural sector.
We should study more urban-rural linkages...



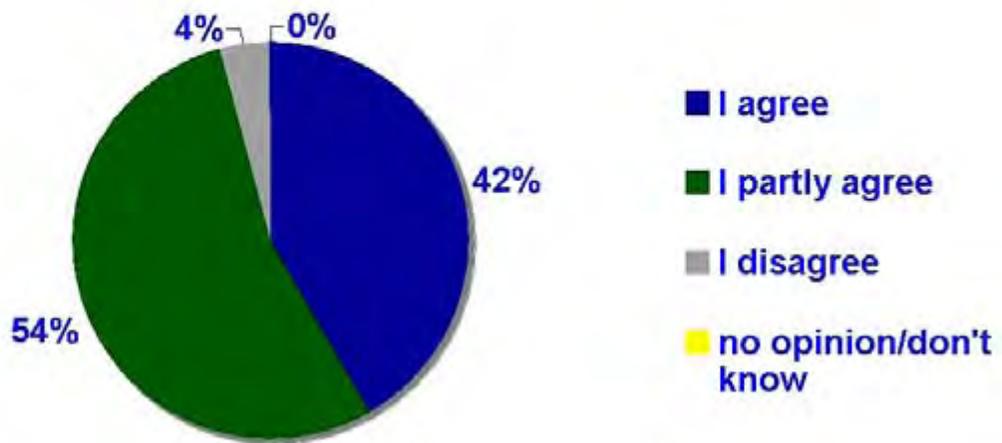
n = 24

In developing countries, the main engine of growth is...
(tick more than one box if necessary)



n = 25

Subsidies for inputs should be granted for a limited time to support small farmers...



n = 24

The International Food Policy Research Institute (IFPRI) was founded in 1975 to develop policy solutions for sustainably meeting the food needs of the developing world. Its vision is a world free of hunger and malnutrition. The 2020 Vision Initiative seeks to develop a shared vision and consensus for action for meeting food needs while reducing poverty and protecting the environment. IFPRI is part of a global agricultural research network, the Consultative Group on International Agricultural Research.

International Food Policy Research Institute
2033 K Street, NW
Washington, DC 20006-1002 USA
Phone: +1-202-862-5600
Fax: +1-202-467-4439
Email: ifpri@cgiar.org
www.ifpri.org

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Overseas Development Institute
111 Westminster Bridge Road
London SE1 7JD UK
Phone: +44-(0)20-7922-0300
Fax: +44-(0)20-7922-0399
Email: odi@odi.org.uk
www.odi.org.uk

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Imperial College London
South Kensington campus
London SW7 2AZ UK
Phone: +44-(0)20-7589-5111
Email: info@imperial.ac.uk
www.ic.ac.uk