PROCEEDINGS OF A WORKSHOP ON

AGRICULTURAL GROWTH LINKAGES

IN SUB-SAHARAN AFRICA:

held at the
United States Agency for International Development
Washington D C

May 26, 1994

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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INTRODUCTION

Christopher L Delgado

These are the proceedings of a workshop held at USAID, Washington, May 26, 1994 The workshop discussed the results of an IFPRI research project commissioned and funded by the United States Agency for International Development, Africa Bureau, Office of Analysis, Research, and Technical Support, Division of Food, Agriculture, and Resources Analysis, under BOA/DAN-4111-B-00-9112-00, Delivery Order No 5 The research team consisted of Christopher Delgado, Jane Hopkins, Anna Alfano, Peter Gruhn, and Jayashree Sil, of the Markets and Structural Studies Division (MSSD), Peter Hazell and Behjat Hojjati, of the Environment and Production Technology Division, and Valerie Kelly, formerly of MSSD and currently at Department of Agricultural Economics, Michigan State University

The project could not have been attempted without the prior existence of detailed household-level data sets collected by IFPRI in collaboration with various African and CGIAR partner institutions, and used jointly with them in other research work The close involvement in the present project of members of the original country research teams that collected the data was also essential, both to ensure that the data were interpreted correctly and to add location-specific knowledge to the analysis The research team also acknowledges with gratitude its debt over many years to other colleagues who were involved with the projects that originally collected the data and

helped shape the views of the present authors In this regard, particular appreciation is extended to Tom Reardon of MSU for his many contributions to the field and to the prior research on which the Sahelian cases of the present project are based

The Burkina Faso data set was collected in 1984/85 in collaboration with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) The Niger data set was collected in 1989/90 in collaboration with the Institut National de Recherche Agricole du Niger (INRAN) and the ICRISAT Sahelian Center The Senegal data set was collected in 1989/90 in collaboration with the Institut Senegalais de Recherches Agricoles (ISRA) The Zambia data set was collected in 1985/86 in collaboration with the Rural Development Studies Bureau of the University of Zambia The Zimbabwe data were collected in 1987/88 in collaboration with the Department of Physical Planning, Ministry of Local Government, Rural and Urban Development, Government of Zimbabwe

Last but not least, the team would like to acknowledge the moral support and interest in the project received from Dr George Gardner and colleagues at USAID, whose knowledge of and long-term interest in rural Africa is a source of inspiration in difficult times

These proceedings contain the Table of Contents from the final report, which contains 269 pages, a summary of the final report, the agenda for the Workshop at USAID, fact sheets and diagrams summarizing the results for each of the components of the study, and a summary of the discussions at the workshop

AGRICULTURAL GROWTH LINKAGES IN SUB-SAHARAN AFRICA

C Delgado, J Hopkins, V Kelly
with
P Hazell, A Alfano, P Gruhn, B Hojjati and J Sil

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EXECUTIVE SUMMARY

Christopher L Delgado
and other authors of the main report

The objective of the present study is to assist decision-makers to better understand the current linkages between the agricultural and non-agricultural sectors in Sub-Saharan Africa, and to strengthen these linkages for accelerated rural economic growth It addresses how increased rural incomes are spent on a mix of agricultural and non-agricultural good and services, the implications of these expenditure patterns for the potential to stimulate growth in rural areas through the alleviation of demand constraints, and areas of intervention necessary to sustain growth originating from stimulus to tradable agriculture from economic reforms, such as Structural Adjustment Programs

Country case studies utilize existing household-level panel data sets collected by IFPRI in collaboration with various African institutions and used for different purposes elsewhere The data cover weekly or bi-weekly panels for one full year, running over 1984/85 for Burkina Faso, 1989/1990 for Niger and Senegal, and 1985/86 for Zambia

Senegal is clearly the most open and internally well-articulated of the sample countries Niger is relatively open, but has a low

degree of internal trade Burkina Faso exhibits a low degree of openness and a low degree of internal trade Zambia and Zimbabwe exhibit a relatively good degree of internal trade, but a very low degree of external openness by our indicators Both the Senegal and Niger samples were observed during above-average harvest years The Burkina sample was observed during a very bad drought year, following on two other drought years The Zambia data come from a good harvest year, when the study zone had a year to recover from the devastating drought of the early 1980's

Chapter 1 synthesizes issues and results encountered across the study Chapter 2 examines the preceding literature and derives issues Chapters 3, 4 and 5 are devoted to the Burkina Faso, Niger and Senegal case studies, respectively Chapter 6 reports the Zambia case study, with sections to identify comparable elements in Zimbabwe, in the absence of comparable data

CONVENTIONAL WISDOM ON RURAL GROWTH LINKAGES IN AFRICA

Growth multipliers tell us how much extra net income growth can be had in rural areas from stimulating net new production of goods and services with a stream of consumer and intermediate spending of new household income originating from structural changes such as technological progress, improvement in export prices, and so forth The actual multiplier is a numerical derivation from a regional model that incorporates household demands and intermediate demands between sectors, and explicitly models these inter-relationships

Like all regional models, the results depend largely on deciding what is inside the area of interest for computing costs and benefits,

and what is outside The study looks at this issue in depth, computing results for three alternative assumptions (a) the only issue of interest is impact on local incomes, (b) the national perspective, (c) the multi-country regional perspective Unless otherwise stated, the results summarized here are from the national perspective

Growth linkages occur because under-employed resources are drawn into production by new local demand for things that they can produce This can only occur if there are in fact under-employed resources Resources are assumed to be under-employed because there is insufficient demand to purchase what the resources can be used to produce This situation typically arises because of remoteness and poverty, and may be associated with visible or hidden under-employment of people or land Local prices for the demand-constrained items in question exceed what they can be sold for through export, but are less than would be required to make money importing the good in question

More precisely, the term "non-tradable" is used for goods that at prevailing relative prices are rarely, if ever, traded across the borders of the chosen zone of analysis, and do not have close substitutes in local consumption, in the sense that the domestic price of the non-traded good is not well-correlated with the domestic price of any tradable good that could play the same role in the consumption basket By definition, services are non-tradables, since the service occurs at the point of purchase Tradables, on the other hand, can in theory always be imported or exported at a constant price given by the world outside the region in question

Beyond the initial income stimulus, increments to income arise from new spending--both retail and through demand for intermediate inputs--on farm and non-farm items that are non-tradables with respect to areas outside the region of interest Because new effective demand for these items cannot be met by imports (by definition), they are assumed to be met by increased local production The latter assumption is also key, and is examined in more detail below

Earlier growth linkage literature, in both Africa and Asia, was preoccupied with the direct contribution of agriculture to industrialization It assumed that agricultural items such as food staples and food variety items are tradable goods, the production of which was constrained by the availability of land ("supply-constrained") Local manufactured goods were assumed to fit the non-tradable category as defined above Growth linkages occurred from the re-spending of agricultural incomes from the Green Revolution on local non-agricultural goods and services, stimulating their production

Consumer spending of additional rural incomes from exogenous sources on items such as "food" was considered a "leakage" for growth, in the sense that new effective domestic demand for food either displaced exports of foods from rural areas, or encouraged further import of food, without any net addition to local production Taking "food" as a tradable agricultural good virtually ensures both that estimated growth multipliers will be low in Africa, and that growth in agricultural incomes will not lead to growth in rural non-farm employment, since rural people on the continent are thought to typically spend a large share of increments to income (have a "high marginal budget share") on food products Thus rising rural incomes,

being spent on tradables, only serve to decrease what the region is already exporting or increase what they are already importing, depending on the region's comparative advantage Not surprisingly, previous estimates of rural growth multipliers in Africa have been low

RESULTS

The main results of the study can be summarized under six headings

(1) African rural growth linkages are much higher than previously thought

This study finds radically more optimistic results than previous estimates of growth multipliers, due to in-depth investigation of the underlying assumptions about tradability of different commodities, attention to whether value-added occurs in the farm or non-farm sector, and the use of data of a quality without precedent in the present study countries concerning household expenditure patterns Overall, the additions to income from adding a dollar of new (exogenous) farm income in the study zones is to increase total income by $2 75 in Burkina Faso, $2 48 in Zambia, $1 97 in Senegal, and $1 96 in Niger

The report looks at growth multipliers in detail by geographic region, by income group, and under a variety of different assumptions Overall, the message is the same the extra growth that can be had from stimulating demand for non-tradable items in rural areas of the

study countries is at least as high as the initial stimulus itself This also implies that the overall benefit of finding a way to sustainably boost rural incomes on the supply-side is at least twice as high as the immediate return from the activity that was promoted in the first place

Under-used resources are drawn into production through new consumer (including wholesale) demand and through intermediate demands The latter are production linkages, growing production of some items, whether tradable or not, involves new demand for some intermediate inputs that cannot be profitably imported Detailed investigation shows that the share of farm linkages attributable to consumption alone was 42 percent in Senegal, 79 percent in Niger, 93 percent in Burkina, and 98 percent in Zambia While the relative importance of consumption linkages does depend upon production relations, and especially on the use of non-traded intermediate inputs, it is clear that consumption linkages cannot be ignored, even where production linkages are important, as in Senegal

(2) Sub-sectors that account for growth arising from consumer spending are services, non-tradable farm commodities, and local non-farm goods.

In view of the importance of consumption linkages, it is important to know how rural people spend increments to income, whether the items are demand-constrained (non-tradable) or not, and which sector benefits from the expanded demand Average budget shares measure the percentage of total household expenditures going to that good group Marginal budget shares measure the percentage of additions to income that are allocated to the good group in question,

and thus the direct impact of income changes on the consumption of the good group in question Income inelastic demand (MBS < ABS) implies that the relative importance of that commodity in the consumption basket decreases as total expenditure increases

The study classified individual commodities and services into two sectors, farm and non-farm, and two tradability categories, tradable and non-tradable, for three alternative definitions of region of interest (local, national, West Africa) [1] The farm sector is limited to items bought directly in the condition that they leave the field crops in unprocessed or barely processed form, livestock, milk, etc Since other studies show that farmers typically get up to half their income from non-farm activities in Africa, it is clear that the "non-farm" sector in most of rural Africa is composed primarily of the non-cropping, non-livestock-rearing activities of farmers It is therefore consistent to label as "non-farm" those items that result from the off-farm activities of "farm" households, including food processing Thus, "food" includes tradable farm foods, such as some grains, non-tradable farm foods, such as milk, tradable non-farm foods, such as certain spices and condiments, and non-tradable non-farm foods, such as many other locally-produced processed foods

Specific categorizations of goods for specific study zones are given in the country chapters All services are considered non-tradables, prepared foods that are not packaged for transit (sorghum beer, millet cakes, etc) are local non-tradables, as are fresh meat

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[1] The classification by region of interest applies primarily to the West African studies This breakdown was not possible with the Zambia data, although some broad assumptions could be tested

and dairy products More items become non-tradable at the national level of tradability Examples would be fruits and vegetables, most prepared foods (such as peanut butter), and some starchy staples, including millet and sorghum in Burkina Faso and Senegal, and cassava, sweet potatoes and fonio in all cases At the "regional" level of tradability, significant consumer items typically become non-tradables Millet and sorghum in Niger is an example

The average budget share for "food" in the country samples runs from 88 percent in the Burkina Faso to 72 percent in Senegal In all cases, the demand for food is inelastic with respect to income Yet, the marginal budget shares for food are still so high that the absolute impact on food demand of an increase in rural incomes will still be quite large Improvements in incomes in the study zones can be expected to put demand pressure on foods supplies In the poorer areas, this will be more on basic staples In richer areas, this will be more on higher priced (more preferred) calories, since consumers are sufficiently better off to begin the process of substituting higher price calories (rice, fish) for lower priced ones (millet) as income rises

The marginal budget share for non-food commodities is high only in Senegal, at 51 percent, it is 22 percent in Niger, 19 percent in Zambia, and 12 percent in Burkina Faso Demand is income-elastic for these items as a whole in all the sample zones The same is true of services, which have marginal budget shares ranging from 16 percent in Niger to 3 percent in Senegal The country chapters provide considerable detail on which items are most income-elastic

In Zambia, 75 percent of all consumer expenditures in the sample were on non-tradables, implicitly defined at the national level, most of this was on farm goods Two-thirds of increments to income went to non-tradables, as was the case in Burkina The marginal budget share for non-tradables was 47 percent in Niger and only 25 percent in Senegal Except for Niger, the budget share for non-tradables as a group decreases as income increases (MBS < ABS)

Among farm goods, the principal non-tradable commodities with elastic demand are livestock products (meat, milk, eggs, etc) Livestock products and services have an especially high average budget share in Niger The other components of farm non-tradables in countries other than Niger (principally millet and sorghum in Burkina Faso and Senegal and other home-grown foods in Zambia) are sufficiently inelastic in demand with respect to income that they outweigh the elastic response of livestock products and services, making farm non-tradables, as a group, inelastic Demand for farm non-tradables is especially inelastic with respect to income in Senegal, as higher income households appear to be in the process of shifting their staple consumption patterns to rice, a tradable at all levels

Non-food, non-farm commodities are income-elastic everywhere, but tend to be largely imports or import-substitutes with respect to the world market Services and many processed food commodities are non-farm non-tradables with income-elastic demand in all country case studies

In sum, detailed analysis of the expenditure data in the country chapters shows that rising rural incomes in the study zones, should

they occur, are likely to put considerable upwards pressure on the relative prices of many farm goods, mainly local unprocessed food items, some non-farm goods, including processed foods and intermediate inputs to farming, and on services Many of these items are non-tradables at the national level of tradability

(3) Only sustained growth in rural incomes that is widely spread across households is capable of unlocking significant additional growth

A perennial issue for supply-side agricultural growth strategies in Africa is that increments to income from price reforms or improvements in the terms of trade are typically widely spread in small increments over a large number of people, because of the comparative absence of a land-owning class in most countries Because rural people are poor, then, these increments go for consumption, typically extra food, rather than being concentrated in landlord profits, used for savings and investment While helping food security, this extra consumption only displaces exports or increases imports, according to that view This was one of the main justifications offered for State taxation of export agriculture, in order to mobilize surplus for growth

Restoration of the demand-side as a valid issue in Africa, through its focus on tradability issues, illustrates that widespread increments to the incomes of rural households can also play a major role in mobilizing under-used resources, through the encouragement of employment in non-tradable sectors The effect of widespread increases in spending on the sorts of non-tradables that rural people consume--dairy, fruits, vegetables, some starches, services, local

agricultural implements, and so forth--can mobilize labor, capital and land outside peak periods for viable income opportunities The study shows that even small increments to rural incomes that are widely spread can make big net additions to growth, besides improving food security

The study results also show that Africa may be different from those parts of Asia where the demand-side of growth was traditionally emphasized The Asian growth linkages literature reviewed in Chapter 2 tends to stress that since the rural rich have consumption patterns more oriented to spending increments to income on manufactured goods and services, targeting income to the rich rather than the poor will have a greater stimulative effect on demand for non-farm items than the same income targeted to the poor

The country chapters show that under the national definition of tradability, the poorest one-third of households of the all the country samples had higher marginal budget shares for non-tradable items than the richest one-third of households The difference in marginal budget share for all non-tradables between the rich and poor went from 20 percent in Senegal, to 3 to 6 percent in the other case studies This implies that a dollar of income directed to the poor will have more linkages benefits for growth than a dollar directed to the rich, cet par The higher marginal budget shares for non-tradables of the poor is due to the fact that the poor have a much higher marginal budget share for farm non-tradables than do the richer households Thus harmony between growth and equity objectives in the present growth linkage work is primarily due to a better view of whether farm items are tradable or not

(4) Only growth in agricultural exports provides the widespread and recurring income source needed for an economically sustained rural growth process

For growth linkages to be part of a sustained pattern of economic development, the initial income shock from the tradable sectors must be regularly reproduced Only the sustained production and sale of tradable commodities can do this The commodity groups most likely to provide such an engine are a matter of comparative advantage, which is not dealt with here Conventional wisdom suggests that traditional agricultural exports are most likely to play this role peanuts, cotton, or livestock The experience in Niger and Burkina Faso during periods when coastal demand was strong is that some new exportables, such as cowpeas, onions, poultry, and vegetables, may also have great potential for regional exports as well

Technological change, lending, or other stimuli to the non-tradable sectors, in the absence of growth in the tradable sectors, is a one-shot and unsustainable venture In the absence of regularly recurring sources of demand, it is only likely to lead to mountains of unsold produce by the roadside--as in the maize mountains of the middle belt in Nigeria in the late 1970's--and falling producer revenue under conditions of price inelastic demand Without a regularly recurring injection of income from trade with locations outside the immediate zone of interest, the myriad activities in the non-tradable sectors dependent on the demand thus created will wither growth multipliers work in reverse as well

Sustaining growing populations on fragile resource bases, as in the Niger case study zones in particular, requires providing a growing supply of jobs outside agriculture Paradoxically, it is hard to see how this can be done in the study zones without greater emphasis on boosting incomes from agricultural tradables, to support the creation of non-farm jobs in rural areas through boosting local demand for non-farm goods and services

(5) More attention needs to be devoted to increasing supply-responsiveness of major non-tradable rural consumption items, including local starchy staples and livestock products.

Realizing the growth potential offered by strong demand linkages will require a price-elastic supply of those things that rural people wish to consume more of as their incomes go up Further research should look at the issue of how policy can increase the elasticity of supply of those non-tradables that currently have large marginal budget shares in consumption The high average expenditure share for starchy staples suggests that--despite slightly income-inelastic demand--they can form either a prime source of--or major bottleneck to--growth Livestock products and other non-tradable processed foods are also important in some regions The country studies identify commodities that are likely to be in demand in some detail

The impact of price-inelastic supplies of these non-tradable items would be to weaken potential growth multipliers by up to one-third, since increased demand will be met by relative price rises rather than by increased local production When a non-tradable accounts for a large marginal budget share, such as millet and sorghum in Burkina Faso, using growth multipliers to boost rural employment

may require specific policies to boost the supply responsiveness of these commodities Depending on the specific situation, the appropriate policy response could be on either the production side (improved access to research, inputs and support services) or the trade side (infrastructure, more friendly institutions, easier imports) The cost-benefit analysis of returns to these interventions would need to include the indirect benefits from permitting growth multipliers to work more smoothly, which is almost never done

(6) Without supply-responsiveness for non-tradable goods that people wish to buy when their incomes increase, the income gains from structural adjustment could be choked off by rising wage demands

Economic reform paradigms for re-starting growth in small, open African countries very properly focus on providing improved incentives for local production of tradables through devaluation, liberalization, and austerity However, reaping the fruits of export-led growth also requires policy attention to increasing the supply of non-tradable goods that export crop producers and other workers spend their incomes on, such as coarse grains and other food items currently having a large marginal budget share Otherwise, success in export promotion that is not taxed away by governments could lead to rising prices for local consumer and intermediate demand items

If prices of local consumer items rise relative to export prices, which are fixed by world market conditions and marketing costs, it becomes relatively less profitable to engage in export agriculture The result is that success begets is own demise, unless something occurs to break the vicious circle The latter may or may

not occur spontaneously, but will occur better and faster where it is given a helping hand Maximizing the growth benefits of Structural Adjustment in the semi-open economies of Africa requires a strategy to avoid demand-side bottlenecks that, properly handled, can be turned into powerful growth linkages

AGENDA

Workshop on Agricultural Growth Linkages in Sub-Saharan Africa

Room 1912
U S A I D
Department of State

May 26, 1994

Extensive new empirical evidence based on in-depth household surveys shows that rural growth multipliers and linkages to non-farm activities are much higher than previously thought The research shows that only sustained growth in rural incomes that is widely spread across households is capable of unlocking significant additional growth in goods and services that account for large shares of incremental spending from the new household incomes Only growth in agricultural exports provides the type of widespread and sustained initial household income shocks needed for an economically sustained rural growth process More attention needs to be devoted to increasing supply-responsiveness with respect to prices of certain major non-tradable rural consumption items Failing such efforts, the export gains from structural adjustment could be choked off by rising wage demands as rural people try to keep up with the rising cost of feeding their families

8 30 - 9 00 Coffee and Pastries

9 00 - 9 15 **Background to the Workshop.**

Welcome by Tom Olson AFR\ARTS\FARA\FSP

AID's interest in economic development strategy
J Wolgin AFR\DAA (Acting)

The ARTS\FARA agenda in economic research
Curt Reintsma AFR\ARTS\FARA

The IFPRI--ARTS/FARA project
George Gardner AFR\ARTS\FARA\FSP

9 15 - 9 40 **Agricultural Growth Linkages in Sub-Saharan Africa: An Overview**

Presentation — Christopher Delgado, IFPRI/MSSD

What are linkages?
Why do they matter?
How can they be observed?
Prior conventional wisdom
Brief overview of project findings
Some broad implications

9 40 - 10 05 General Discussion

Highlights from the Burkina Faso Case Study

10 05 - 10 15 Presentation — Christopher Delgado, IFPRI/MSSD

Country-specific results
Key role of staple food prices

10 15 - 10 30 General Discussion

10 30 - 10 45 Coffee Break

The Niger Case Study

10 45 - 11 00 Presentation — Jane Hopkins, IFPRI/MSSD

Country-specific results
Cross-border trade
Dealing with the fragile natural resource base

11 00 - 11 15 General Discussion

The Senegal Case Study

11 15 - 11 30 Presentation Valerie Kelly, MSU/DAE

Country-specific results
Production issues in a traditional cash cropping zone
The implications of openness

11 30 - 11 45 General Discussion

The Zambia/Zimbabwe Case Study

11 45 - 12 00 Presentation Peter Hazell, IFPRI/EPTD

Country-specific results
Weak non-farm links
Diversification into fruits and vegetables

12 00 - 12 15 General Discussion

Implications for Growth Strategy

12 15 - 12 30 Panel discussion

Peter Hazell and Chris Delgado, IFPRI
Jerry Wolgin, AID\AFR\ARTS

WORKSHOP ON AGRICULTURAL GROWTH LINKAGES IN SUB-SAHARAN AFRICA

USAID/AFR/ARTS/FARA

International Food Policy Research Institute

Agricultural Growth Linkages in Sub-Saharan Africa: A Synthesis

Christopher L Delgado, Jane C Hopkins, and Valerie K Kelly

KEY FACTS

THE STUDY

The study addresses how increased rural incomes are spent, the implications of this for growth in rural areas, and policies necessary to sustain it

The case studies utilize existing weekly or bi-weekly household-level panels for one full year

- 1984/85 for Burkina Faso, a drought year, agro-climatic variation, low degree of openness to trade,
- 1989/1990 for Niger and Senegal, above-average harvests, Senegal and Niger zones are quite open, trade with Nigeria is important in Niger zones, agro-climatic variation in the Niger sample is high, Senegal is a traditional cash-cropping zone
- 1985/86 for Zambia zone, good harvest, good internal trade, but little external agricultural trade

Growth multipliers = extra income from net new production that occurred in response to new household demand:

- derived from a regional model that incorporates household demands and intermediate demands between sectors,
- occur because under-employed local resources are drawn into production by new local demand for things that they can produce
- Results in Africa depend heavily on the size of the area for computing costs and benefits (catchment area)
- For a given catchment area, some goods are non-tradable with the outside, they are demand-constrained, since new production cannot be exported and new local demand cannot be met by imports

- Non-tradables are items rarely traded across the borders of the chosen zone, and that do not have close substitutes in local consumption
- Growth multipliers are largely driven by the importance of non-tradable goods in incremental consumption

The study computes results for three alternative assumptions

- The only issue of interest is impact on local incomes,
- The national perspective,
- The multi-country regional perspective

Earlier growth linkage literature investigated the contribution of agriculture to industrialization, mostly under Asian conditions:

- Food was assumed to be tradable, local manufactured goods were demand-constrained
- Growth linkages occurred from the re-spending of rising agricultural incomes on local non-agricultural goods and services, stimulating their production
- Since increments to income in rural Africa were widely-spread and spent on foods, previous estimates of rural growth multipliers in Africa have been low

RESULTS

African rural growth linkages are much higher than previously thought

- Adding a dollar of exogenous farm income in the study zones increases total income by $2 75 in Burkina Faso, $2 48 in Zambia, $1 97 in Senegal, and $1 96 in Niger
- The message is the same by geographic region, by income group, and under a variety of different assumptions
- The share of farm linkages attributable to consumption alone was 42 percent in Senegal, 79 percent in Niger, 93 percent in Burkina, and 98 percent in Zambia

Growth arises from consumer spending on services, non-tradable farm commodities, and local non-farm goods

- The farm sector includes crops in unprocessed or barely processed form, livestock, milk, etc
- The non-farm sector includes the non-farming activities of "farm" households, including food processing

- The composition of non-tradables depends upon the catchment area chosen and specific country conditions
- Average budget shares for "food" in the country samples run from 88 percent in the Burkina Faso to 72 percent in Senegal
- Demand for food is income-inelastic, but the marginal budget shares are still so high that the absolute impact on an increase in rural incomes will still be large
- Livestock products (meat, milk, eggs, etc) are the principal farm non-tradables with income-elastic demand Fruits and vegetables are next
- The marginal budget share for non-food commodities (excluding services) is 51 % in Senegal, 22 % in Niger, 19 % in Zambia, and 12 % in Burkina Faso Demand is income-elastic for these items and for services
- 2/3 of increments to income went to non-tradables in Burkina and Zambia, 47 % in Niger and 25 % in Senegal Except for Niger, the budget share for non-tradables as a group decreases as income increases (MBS < ABS)
- Rising rural incomes are likely to push up the relative prices of local unprocessed food items, processed foods, intermediate inputs to farming, and services

Only sustained growth in rural incomes that is widely spread across households is capable of unlocking significant additional growth

- Because rural people in Africa are poor, yet farm their own land, increments to income go for consumption, typically extra food, rather than being concentrated in landlord profits, used for savings and investment
- Increments to the incomes are spent on non-tradables that rural people consume dairy, fruits, vegetables, some starches, services, local agricultural implements, and consumer manufactures
- All (except the latter in most cases) can mobilize rural labor, capital and land when new demand is widespread
- Under the national definition of tradability, the poorest 1/3 of households of the all the country samples had higher marginal budget shares for non-tradable items than the richest 1/3 of households
- The difference in marginal budget share for all non-tradables between the rich and poor went from 20 percent in Senegal, to 3 to 6 percent in the other case studies
- Growth multipliers are higher for income targeted to the poor, contrary to conventional wisdom for land-constrained Asia There is no trade-off between growth and equity in the study zones

Only growth in agricultural exports provides the widespread and recurring income source needed for an economically sustained rural growth process

- For growth linkages to occur, the initial income shock must be regularly reproduced Only the sustained production of tradable commodities can do this
- The commodity groups most likely to provide such an engine are a matter of comparative advantage
- Traditional agricultural exports are most likely to play this role peanuts, cotton, or livestock New regional exportables--cowpeas, onions, poultry, fruits and vegetables--may also have great potential for stimulating linkages
- Extension, lending or other stimuli to the non-tradable sectors--local foods, services, most small-scale rural manufacturing enterprises--is a one-shot and unsustainable venture in the absence of growth in the tradable sectors
- Niche opportunities for such projects are most likely to exist in important cash-cropping zones
- Sustaining growing populations on fragile resource bases requires providing more jobs outside agriculture This requires growth in rural demand for the products of local non-farm jobs, which requires boosting incomes from agricultural tradables

More attention needs to be devoted to increasing supply-responsiveness of major non-tradable rural consumption items, including local starchy staples and livestock products.

- Benefiting from strong demand linkages requires a price-elastic supply of those things that rural people wish to consume more of as their incomes go up
- Further research should look at increasing the elasticity of supply of those non-tradables that currently have large marginal budget shares
- High marginal expenditure shares for starchy staples imply that they can be a major bottleneck to growth unless something is done about their production or distribution
- Cost-benefit analysis of returns to these interventions need to include the indirect benefits from permitting growth multipliers to work more smoothly

Without supply-responsiveness for non-tradable goods that people wish to buy when their incomes increase, the income gains from structural adjustment could be choked off by rising wage demands

- Economic reform paradigms for growth in small, open African countries very properly focus on providing improved incentives for local production of tradables through devaluation, liberalization, and austerity

- Reaping the fruits of export-led growth also requires increasing the supply of non-tradable goods that producers spend their incomes on If they are non-tradables, this will involve facilitating local production

- Failing this, prices of local consumer items may rise relative to export prices, cutting into the profitability of export agriculture The result is a vicious circle

- Maximizing the growth benefits of Structural Adjustment requires a strategy to avoid demand-side bottlenecks that, properly handled, can be turned into powerful growth linkages

WORKSHOP ON AGRICULTURAL GROWTH LINKAGES IN SUB-SAHARAN AFRICA

USAID/AFR/ARTS/FARA

International Food Policy Research Institute

Agricultural Growth Linkages: Relevance and Research Issues for Africa

Christopher L Delgado and Anna Alfano

KEY FACTS

Agriculture in Sub-Saharan Africa accounts for 42% of GDP in low income countries and 27% in middle income countries

Prior discussion of growth linkages between agriculture and other sectors focused on showing how agricultural development stimulates overall rural development through creation of new demand for locally produced non-agricultural goods

Studies typically estimated the extra local income that is created from net new production in rural areas of goods and services, stimulated by spending of new household income originating from some outside factor, such as technical change in local tradables production

The previous studies, heavily concentrated in Asia, show strong evidence that consumption linkages account for more than 50% of total linkages between agriculture and other sectors Focusing only on production linkages greatly underestimates the potential for growth linkages in the agricultural sector, where production-side linkages are characteristically thought to be limited

Studies in India during the Green Revolution showed that for every dollar increase in income, an additional 64 to 87 cents was created through re-spending on local production inputs and consumer items In the Punjab and Haryana regions, 93 additional cents were created, and for the Madhya Pradesh and Bihar regions additional income was estimated to be 46 cents In the Muda River region of Northwest Malaysia, additional income accrued from a one dollar increase in agricultural income was estimated at approximately 80 cents

Relatively few studies have formally estimated growth multipliers for African countries Those that did typically estimate that no more than 50 extra cents is created by stimulation of local enterprise from an initial exogenous increase of one dollar in local rural incomes A recent and rare case, using a more comprehensive methodology (SAM) for Madagascar, concludes that additional income can range from 80 cents to $1 70

The Asian tradition of growth linkages embodies assumptions that, combined with high African marginal propensities to spend on agricultural items, determine that estimated multipliers will be low There are few links to non-agricultural production, and those are the only items that are counted in linkages under those assumptions

- First, in Asian work, the area of interest for assessing benefits is usually limited to the immediate local region, and food staples are world market crops such as rice and wheat This means that almost all agricultural items are not "local goods", even if produced locally They can be sold outside the region of interest "Agriculture", "farm", "food" and "comparative advantage activity" are all used more or less synonymously In Africa, many food staples are non-traded goods, agriculture is very diverse, most farmers are heavily engaged in non-farm work, and non-food staple crops are often the item of comparative advantage

- Second, the Asian literature assumes that almost all non-agricultural items are "local" goods, with limited external markets In Africa, the reverse is more appropriate manufactures are frequently imported

Even if the right assumptions about the origins of goods consumed are built in, results estimated using standard Asian-type models may still overestimate African linkages,

- In the Asian setting it is not unreasonable to assume that local resources, such as labor, can be readily brought out of unemployment and into production to fill an increase in demand for local goods without increasing the price This assumption is less straightforward for Africa

Finally, assumptions about the origins of goods matter to conclusions about whether stimulating the income of the rural rich will bring more local resources in production than stimulating the incomes of the poor One study suggests that since the rich consume more imports than the poor, income targeted to the poor is more efficient at fostering local employment Another points out that since the poor primarily consume food, extra income targeted to them does not stimulate local non-agriculture

WORKSHOP ON AGRICULTURAL GROWTH LINKAGES IN SUB-SAHARAN AFRICA

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Agricultural Growth Linkages in Burkina Faso

Christopher L Delgado and Jayashree Sil

KEY FACTS

Burkina Faso rural households budget large shares of income for food, especially staple grains, but these shares decrease with increasing income for millet and sorghum, pulses and legumes The shares increase with income for other items, especially manufactures, services, and meat and dairy.

- Average household budget shares millet and sorghum (48%), maize, starch and other staples (26%), meat and dairy products (3%), prepared foods (7%), manufactures (9%) and services (7%)
- Increments to household incomes (marginal budget shares) are spent on millet and sorghum (42%), maize, starch and other staples (20%), meat and dairy products (3%), prepared foods (10%), manufactures (14%) and services (11%)

Growth multipliers in Burkina are determined primarily by the marginal budget shares for non-tradable (demand-constrained) goods in consumption and to a much lesser extent by intermediate input demands and other factors.

- Consumption linkages account for 93% of farm growth linkages
- The share of non-tradables in incremental consumption (marginal budget share) increases with the size of trading space (the catchment area) considered Local = 16% , National = 67% , Regional = 81%
- This increase is driven by the increase in the marginal budget shares of farm non-tradables Local = 3%, National = 45%, Regional = 59%

When using an Asian-type definition of catchment area for calculating benefits, multipliers are modest and consistent with previous results for Africa·

Local catchment — Farm Multiplier = 1 31
Non-farm Multiplier = 1 40

When including at least national-level benefits, growth multipliers are very large

- $1 stimulus to farm tradables (like cotton or livestock) ⇒ $1 88 additional income from spending on demand-constrained items
- $1 stimulus to non-farm tradable sector (like batteries or rope) ⇒ $2 07 additional income from spending on demand-constrained items

The tradable rural sector to stimulate initially on the supply-side depends on comparative advantage

- Rural battery production may not work as well as cotton, peanuts and livestock!

When only local linkages are taken into account, multipliers are considerably higher in the higher potential cropping zones

- Using the local catchment area
- $1 stimulus to farm tradables in the Sahelian AEZ ⇒ 16 cents additional income from spending on demand-constrained items
- $1 stimulus to farm tradables in the Guinean AEZ ⇒ 45 cents additional income

This is reversed when benefits are considered over a wider area

- Using the national catchment area
- $1 stimulus to tradables in Sahel ⇒ approximately $2 31 additional income
- $1 stimulus to tradables in Guinean zone ⇒ approximately $1 60 additional income

Once benefits are counted for a larger area than just the local one, growth multipliers are highest for the poorest one-third of households as compared to the rest of the sample

- Counting benefits with a national catchment area
- $1 stimulus to income from farm tradables of poorest 1/3 of HH ⇒ 73 cents more additional income than $1 stimulus targeted at farm tradables incomes of richest 1/3 of HH
- Counting benefits with a regional catchment area

- $1 stimulus to incomes from farm tradables of poor ⇒ $1 39 more additional income than $1 stimulus targeted at the richest 1/3 of HH
- Memo item marginal budget shares for non-tradables with local definition of tradability Poor = 12% & Rich = 24% regional definition of tradability Poor = 84% & Rich = 75%

Using a national-level assessment of benefits, $1 stimulus to farm tradable incomes of the poorest 1/3 of HH ⇒ $2.18 additional income from spending on demand-constrained items, broken down as:

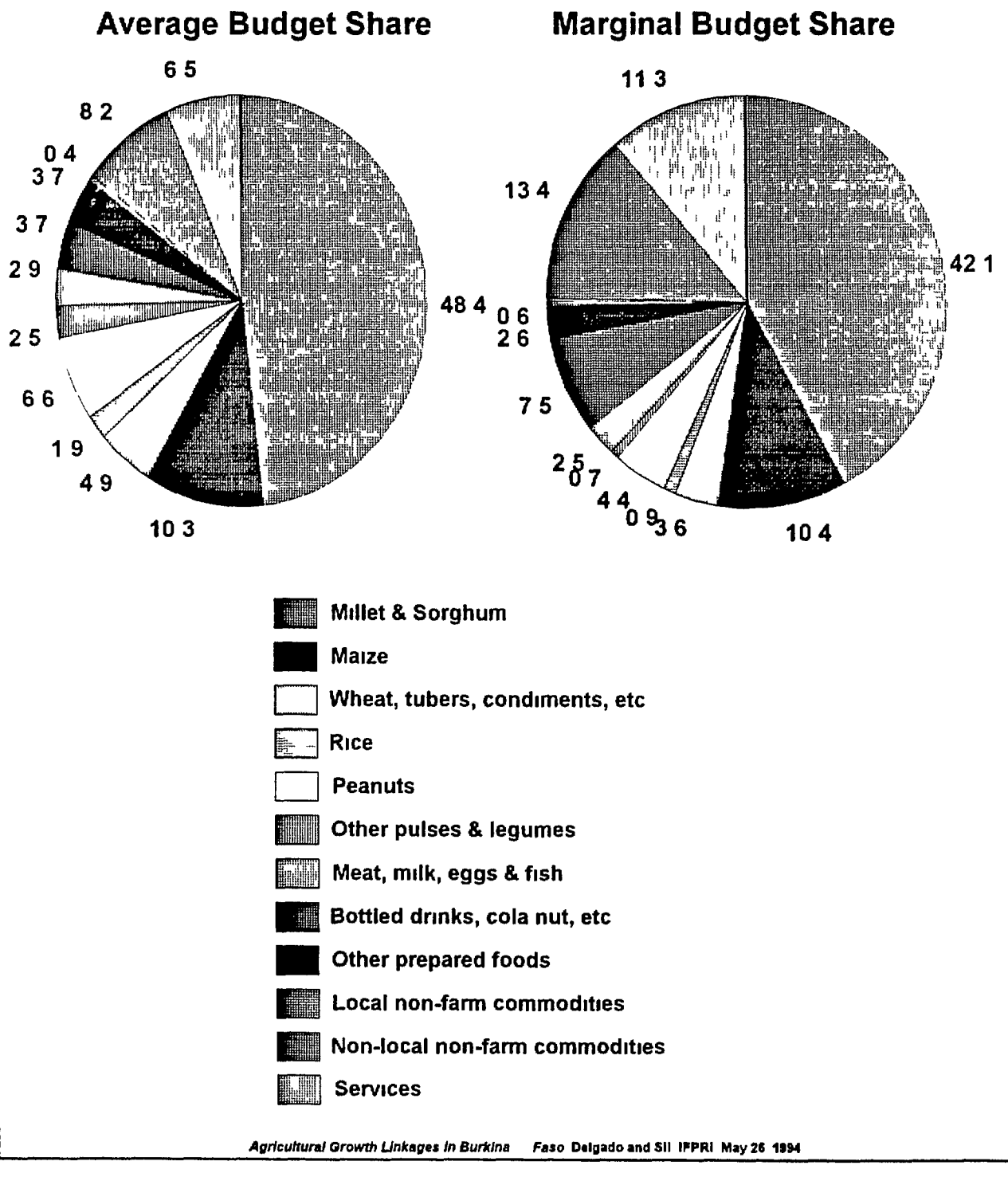
Farm Non-tradables ↙	↘ Non-farm Non-tradables
$1 65 (76%)	53 cents (24%)

Similarly, a $1 stimulus to farm tradable incomes of the richest 1/3 of HH ⇒ $1 45 additional income from spending on demand-constrained items, broken down as

Farm Non-tradables ↙	↘ Non-farm Non-tradables
80 cents (55%)	65 cents (45%)

The Burkina study shows that there is considerable potential to foster widespread and significant growth in both farm and rural non-farm activity through initial stimulation of the farm tradable sector. The latter can only come from promoting activities in which large numbers of rural people have a comparative advantage for export. However, since rural people in Burkina spend so much of additions to incomes on non-tradable foods, growth in export sectors will not be economically sustainable unless means are also found to expand supplies of non-tradable foods. Failing this, relative food prices will rise and eventually export growth will be choked off as labor costs rise as well

Consumption Patterns in Burkina Faso by Good Group (Percent)



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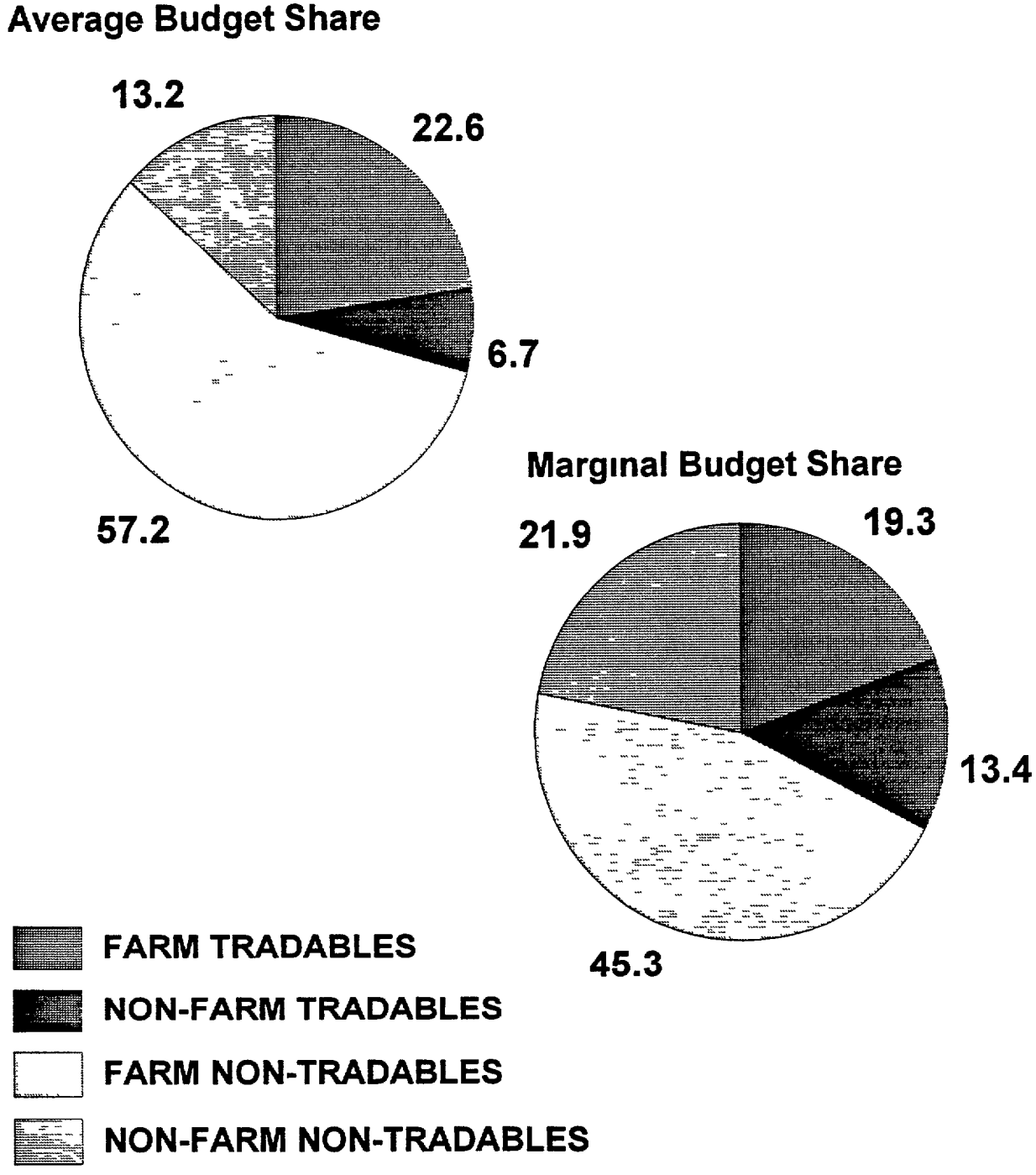
Consumption Patterns in Burkina Faso by Sector for National Catchment Area (Percent)



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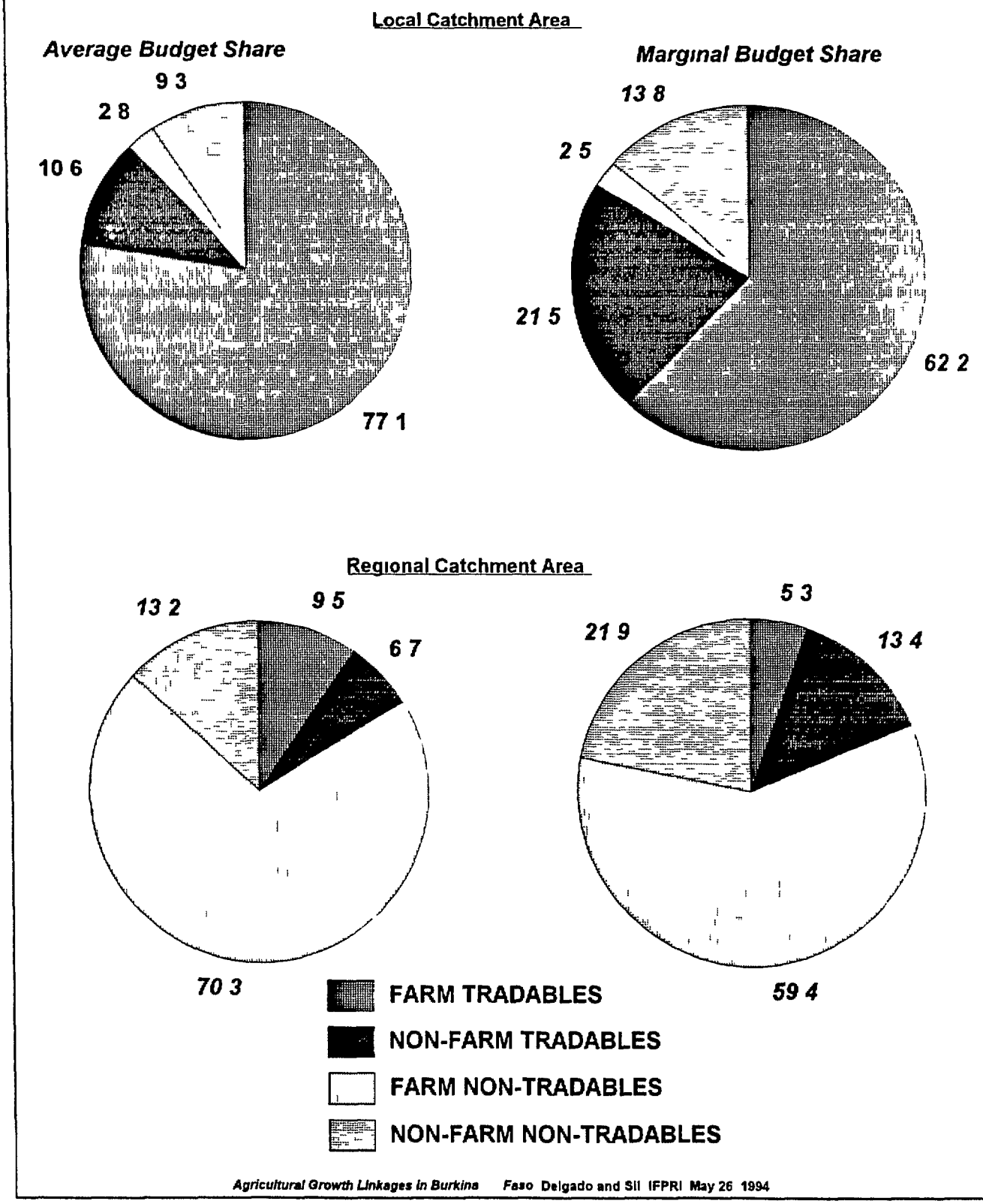
Consumption Patterns in Burkina Faso by Sector (Percent)



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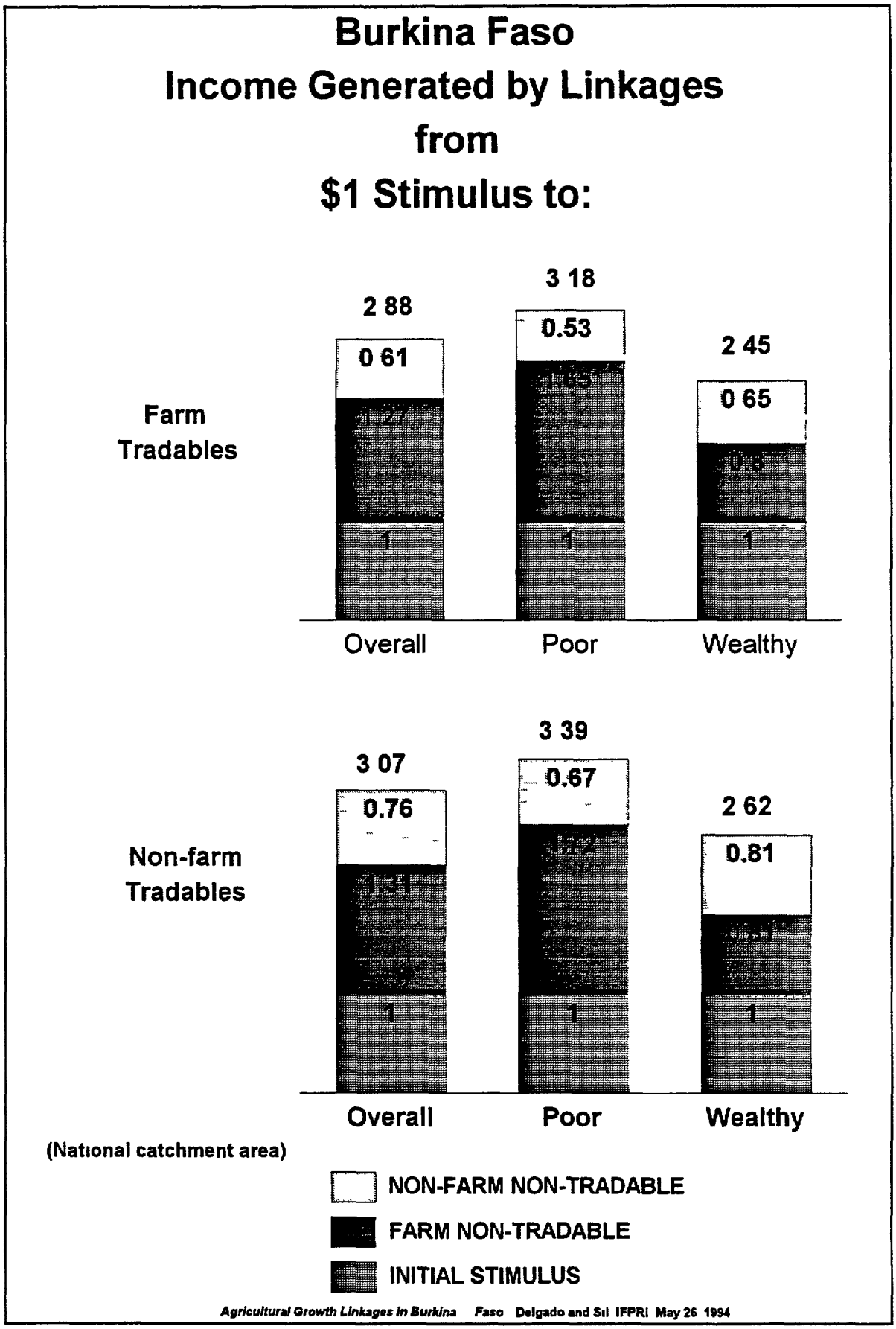
Burkina Faso
Income Generated by Linkages
from
$1 Stimulus to:
Farm
Tradables
2 88
0 61
1.27
1
Overall
3 18
0.53
1.65
1
Poor
2 45
0 65
0.8
1
Wealthy
Non-farm
Tradables
3 07
0.76
1.31
1
Overall
3 39
0.67
1.72
1
Poor
2 62
0.81
0.81
1
Wealthy
(National catchment area)
NON-FARM NON-TRADABLE
FARM NON-TRADABLE
INITIAL STIMULUS
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Farm-Nonfarm Growth Linkages in Niger

Jane C Hopkins, Christopher L Delgado, and Peter Gruhn

KEY FACTS

Niger is a country with a fragile and deteriorating resource base, a rapidly growing population, a dependance on cross-border trade with neighboring coastal countries, and a rural economy characterized by households that are highly diversified into nonfarm activities

- In the Sudano-Guinean zone, 20 to 40 percent of household pulse sales and 30 to 40 percent of livestock sales take place directly in Nigerian or Benin markets In addition, 15 to 30 percent of their cereal purchases occur directly in cross-border markets
- Income from activities other than cropping and livestock husbandry comprise 52 percent of the average Sudano-Sahelian household's income and 43 percent of the average Sudano-Guinean household's income

Results indicate that the agricultural sector can serve as a powerful catalyst for demand-led economic growth in rural Niger.

- A $1 00 increase in farm tradable income (from livestock or cowpea exports for example) will generate 96 cents in additional income in the rural Nigerien economy (i e using national tradability definition)
- Consumption linkages account for 79 percent of the growth multiplier in Niger

Policies and technologies that boost tradable agricultural income will provide a broad-based stimulus to economic growth -- equity and growth objectives are not mutually exclusive

- Income in the hands of the poorest third of households stimulates more overall growth (generating $1 03 in additional income from a $1 00 stimulus) than income in the hands of the richest third of households (which generates 96 cents in additional income)

- At the national level, the poorest third of households spend 35 percent of incremental income on nonfarm non-tradable goods and services whereas the richest third of households spend only 26 percent on these items

- The richest third of households spend 33 percent of increments to income on nonfarm tradable goods while the poorest third spend only 17 percent on nonfarm tradable items

- A $1 00 increase in income from the export of farm tradables will generate 91 cents of additional income in the Sudano-Sahelian zone economy and 81 cents of additional income in the Sudano-Guinean zone economy

Rural growth strategies require enhancement of the supply-responsiveness of the goods and services demanded as incomes increase.

- Locally produced coarse grains (millet, sorghum and fonio) account for the single largest commodity share of household expenditures (39 percent) In addition, 18 percent of any increment to income will be spent on these coarse grains

- Maize (largely imported from Nigeria and Ghana) is particularly important in the diets of the lower potential, Sudano-Sahelian zone households accounting for 4 percent of household expenditures and 9 percent of any increments to income

- Widespread income growth in rural Niger will put considerable pressure on local grain supplies In the Sudano-Sahelian zone, this will lead to increased demand for maize imports, at the same time that Niger's recent devaluation will make maize imports considerably more expensive The result will be to stimulate local coarse grain production further Unless these grains are available in elastic local supply, their price will rise relative to exportables, cutting into the profitability of the latter

- Livestock products account for 9 percent of household expenditures and 13 percent of any increase in income

- Increased attention will need to be focused on the livestock sector to meet the growing domestic demand as incomes increase, as well as the increased demand for live animals from a more competitive, post-devaluation, livestock sector

- Non-food goods and services account for 18 and 10 percent of household expenditures respectively Spending on non-food goods and services will increase as incomes increase -- 25 percent of increments to income will be spent on nonfarm goods while 16 percent will be spent on services

- Food products whose budget shares will increase with increases in incomes include meat, dairy products, pulses, vegetables (fresh and processed), fruits, oils and sugar

Agricultural and environmental objectives are not incompatible. Increases in cowpea or livestock income will have a strong stimulative effect on rural nonfarm employment, alleviating pressure on a fragile agricultural resource base to support a growing population.

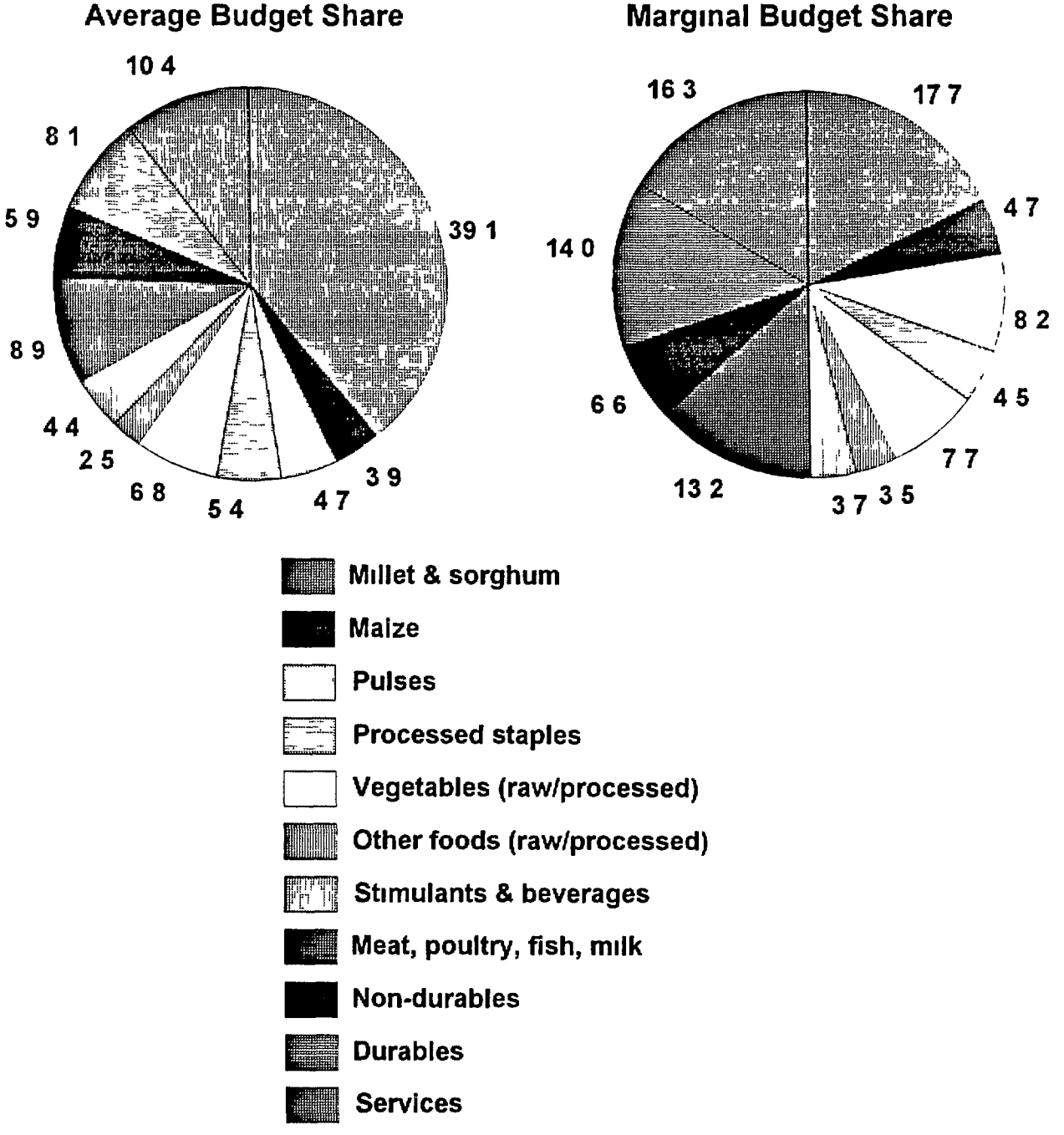
- The additional income generated in the nonfarm sector from a $1 00 increase in agricultural export income is large (67 cents) and 2 to 2 5 times greater than that generated in farm sector
- At the national level, 30 percent of any increase in tradable farm income from the export of cowpeas or livestock will be spent on nonfarm non-tradables creating a growth stimulus for the rural nonfarm sector
- Increases in farm tradable income are an effective mechanism for stimulating nonfarm employment Direct support to non-tradable nonfarm enterprises, in the absence of a sustained market for the output from another income source, cannot create such growth in the nonfarm sector

Coastal countries, particularly Nigeria, have a stake in the development of Niger's agricultural export sector

- Regional multiplier results indicate that a $1 00 increase in farm tradable income will generate $2 34 in additional income in the West African regional economy -- an additional $1 38 over the national multiplier estimate
- The bulk of the increased regional income is attributable to growth in the nonfarm sector, which will generate $1 44 of the additional income
- At the regional level of tradability, 75 percent of any increment to income will be spent on non-tradable goods and services, an increase of 28 percent over the 47 percent of increments to income spent on these items using the national definition of tradability Many of these goods that are non-tradable with respect to the world market, and income elastic in Niger, are produced in Nigeria

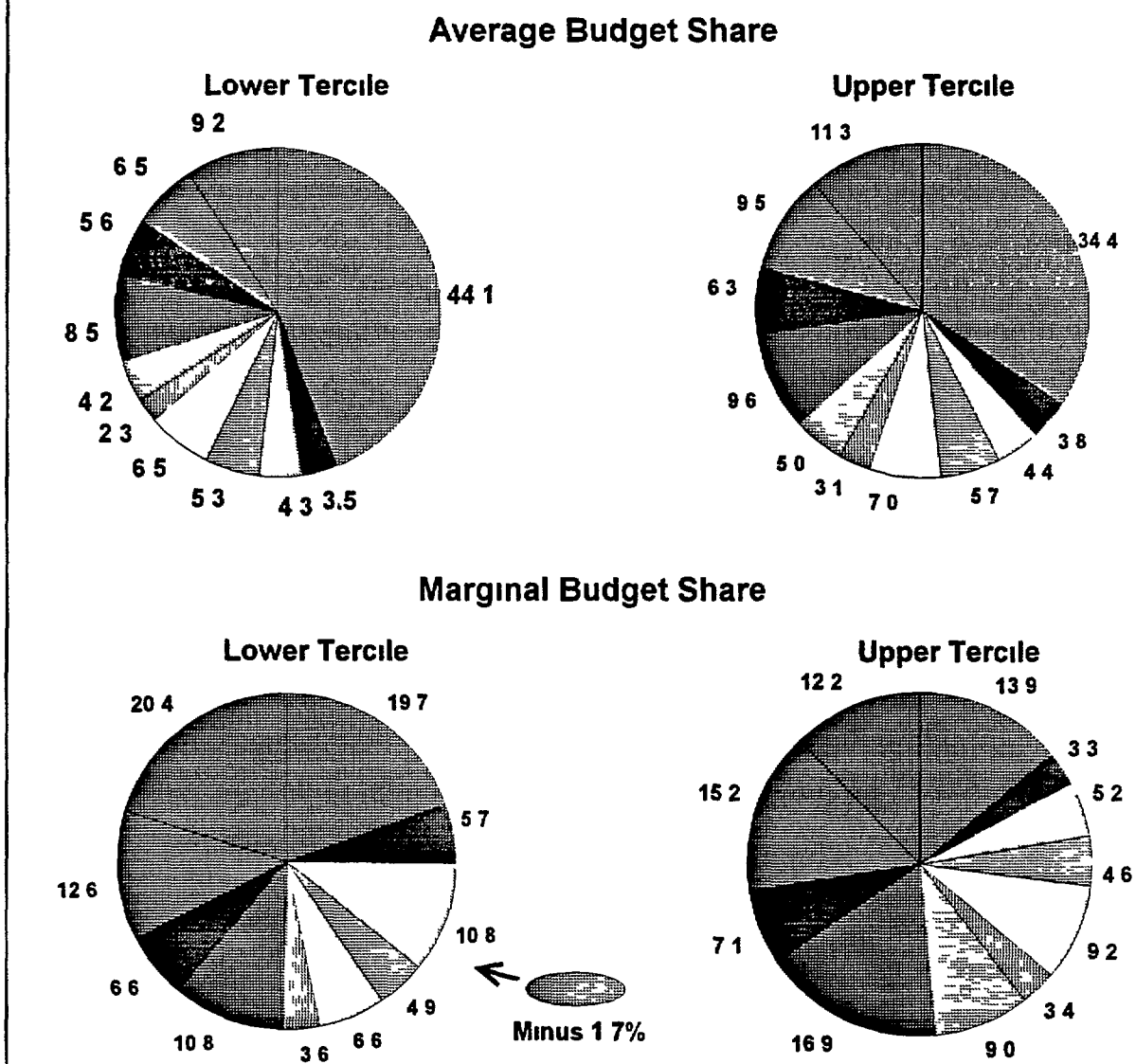
In conclusion, this study provides evidence of high growth multipliers with great potential for stimulating nonfarm employment in rural Niger. Development strategies need to focus <u>both</u> on creating the initial catalyst for Niger's agricultural exports to coastal countries and on increasing the stimulative impact of the income generated from these exports.

Consumption Patterns in Niger by Good Group (percent)



Farm Nonfarm Growth Linkages in Niger Hopkins Delgado and Gruhn IFPRI Ma y 26 1994

Consumption Patterns in Niger by Income Tercile



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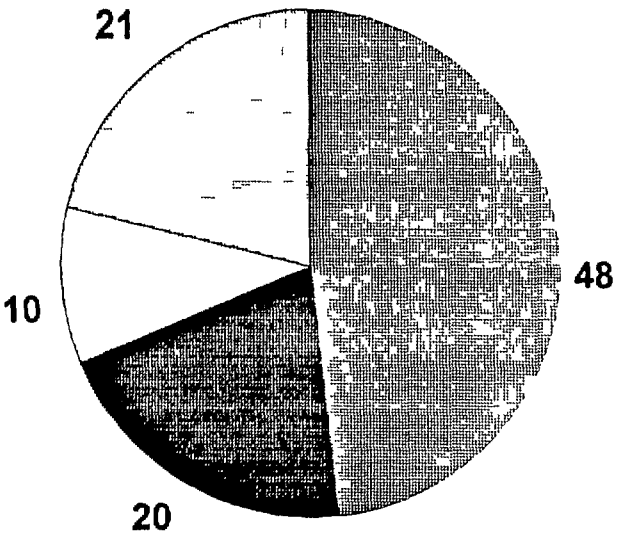
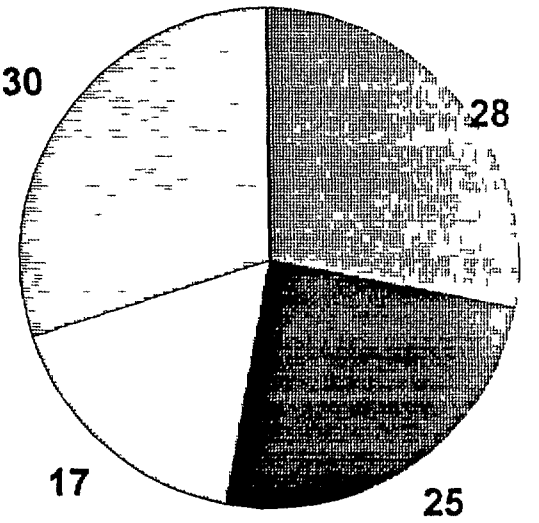
Consumption Patterns in Niger by Sector (percent)

National Catchment Area

Average Budget Share



Marginal Budget Share



FARM TRADABLE

NON-FARM TRADABLE

FARM NON-TRADABLE

NON-FARM NON-TRADABLE

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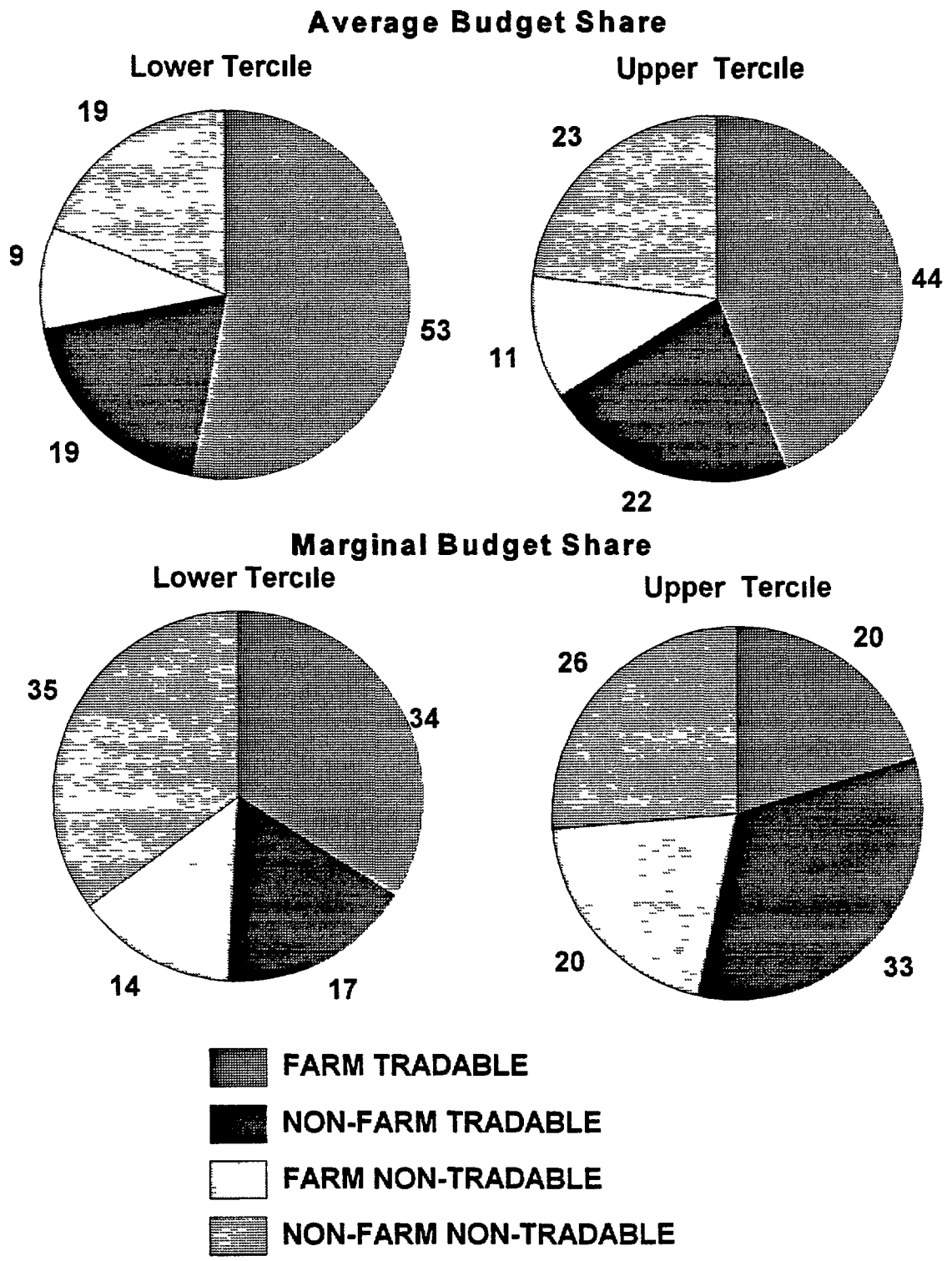
Consumption Patterns in Niger by Sector and Income Tercile



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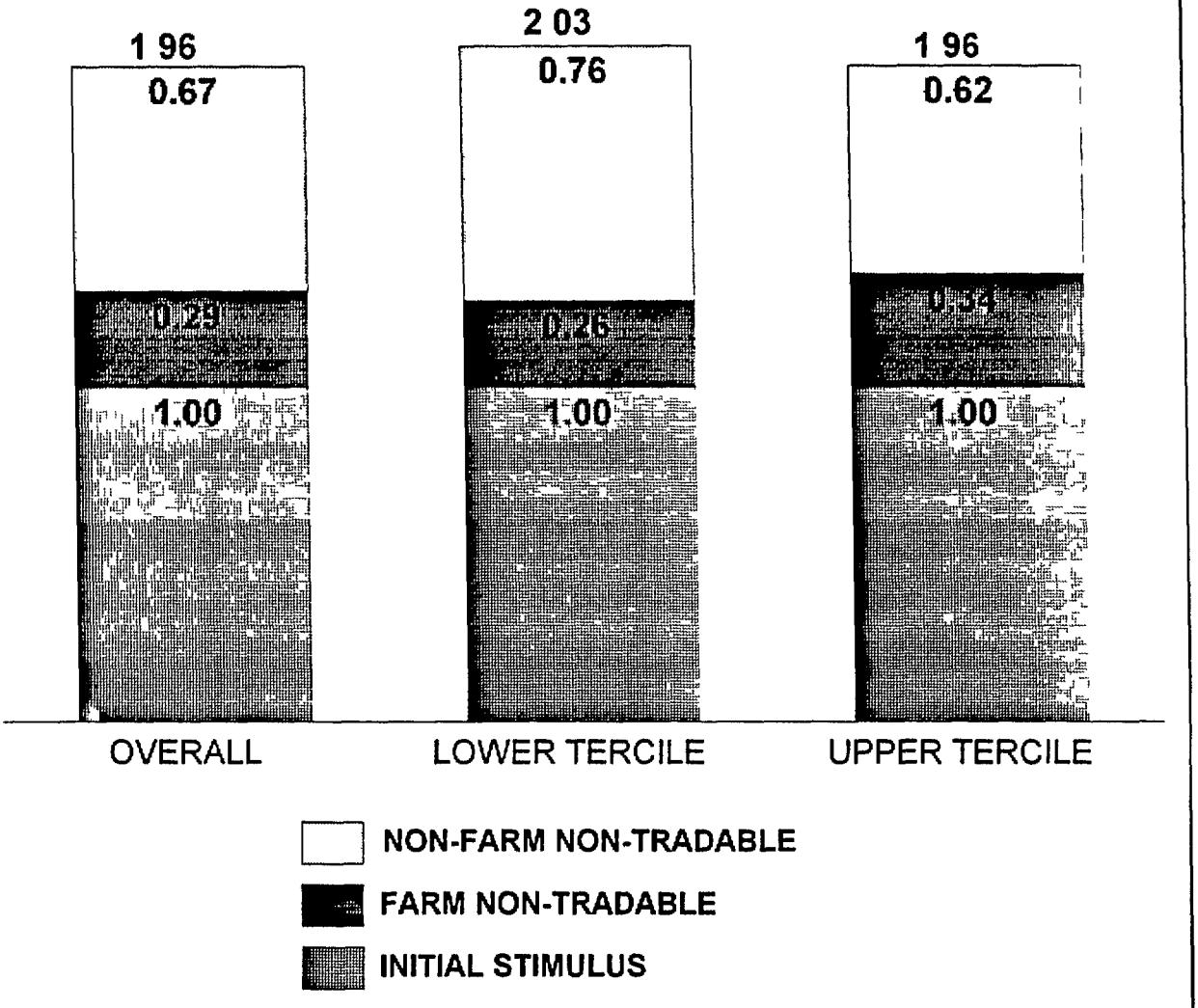
Niger
Income Generated by Linkages from $1 Stimulus to Farm Tradables



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Niger
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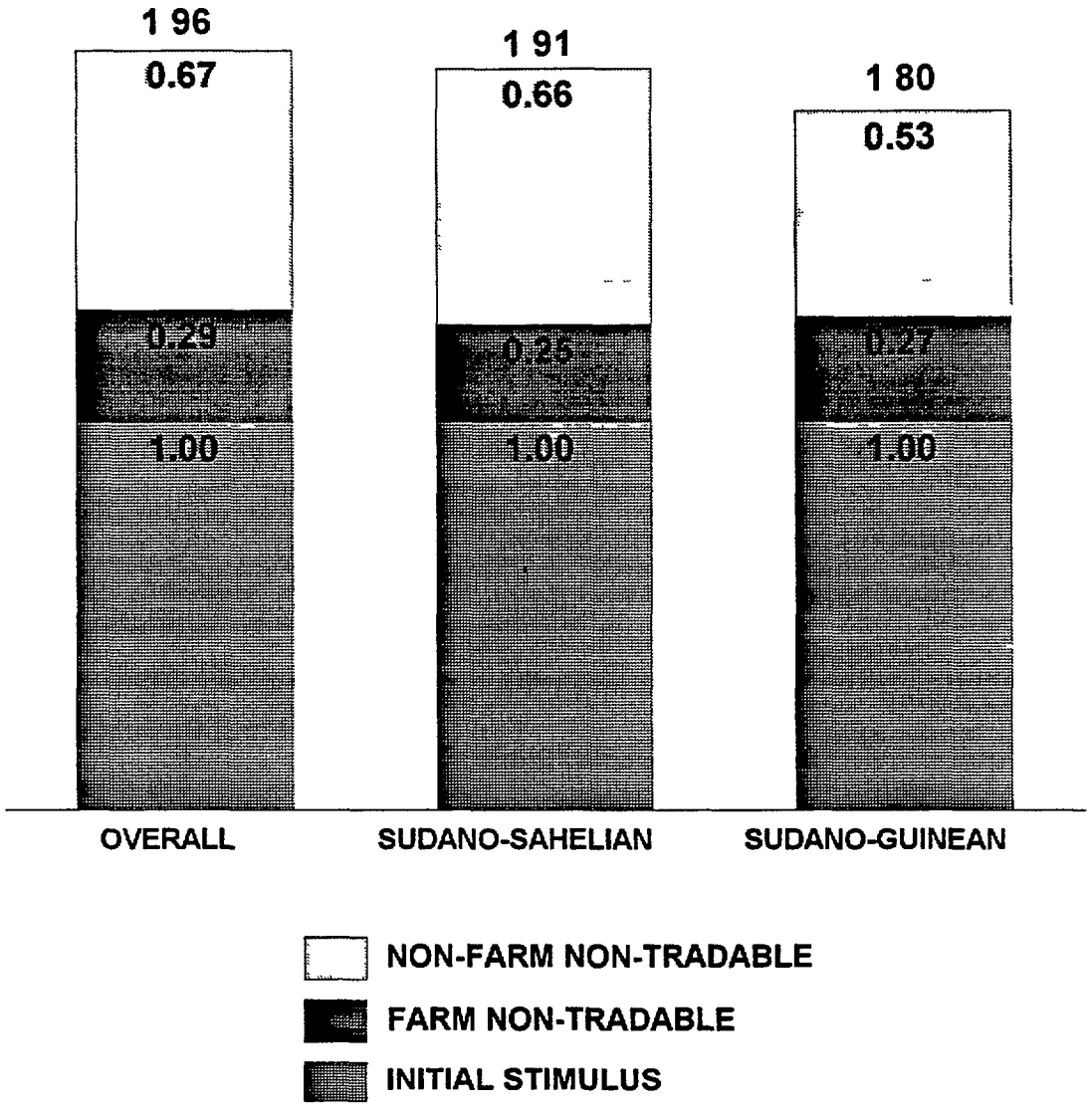

Farm-Nonfarm Growth Linkages in Niger , Hopkins, Delgado and Gruhn, IFPRI, Ma y 26, 1994

WORKSHOP ON AGRICULTURAL GROWTH LINKAGES IN SUB-SAHARAN AFRICA

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Farm Growth Multipliers in the Southeastern Peanut Basin of Senegal

Valerie A Kelly, Christopher L Delgado and Anna Alfano

KEY FACTS

Policies to increase farm income from peanuts will stimulate a substantial amount of demand-led economic growth.

- For every dollar of increase in peanut (or other farm tradable) income, farmers will generate an additional 83 cents in rural Senegalese income through expenditures on production inputs and consumer items
- The additional income increases to 97 cents if we consider benefits within Senegal and Gambia

Growth generated by increasing the income of peanut farmers will be greater than the growth generated by increasing the income of producers of nonfarm tradables

- A dollar of increased income to production of nonfarm tradable goods generates only 41 cents of additional income in the local economy and 52 cents in the national economy (compared to 83 and 97 cents generated by increased peanut income)

The choice of export crop in Senegal matters to demand-led rural growth, because input costs in the peanut sector are a large share of value-added, and most intermediate inputs are locally produced.

- 56 of the 83 cents of 'new' income generated by peanut farmers' expenditures is linked to crop inputs (seed and animal traction services)

Production expenditures provide more stimulus to the local and national economies but less to the regional economy than consumption expenditures.

- Sixty-seven percent of new income generated at the local level comes from production rather than consumption expenditures, 58 percent at the national level, and 42 percent at the regional level

Despite being larger consumers of imported rice, households in market villages have stronger links to the local and national economy than other sample households, because they have strong demand for local farm products (meat, fish, vegetables, and condiments)

- Imported rice accounts for 14 percent of average expenditure and 21 percent of marginal expenditure in market villages, creating greater leakages than exhibited by the overall sample with only 9 percent of average and 11 percent of marginal expenditures going toward rice At the same time, however, Senegalese farm products account for 20 percent of marginal expenditure for market village households, but -3 percent of marginal expenditures for the overall sample

Rural expenditures on domestic nonfood products can contribute substantially to employment growth in light manufacturing industries based in urban areas currently exhibiting high unemployment rates

- The demand for nonfarm nontradables at the national level is elastic (MBS/ABS=1 87) and accounts for 28 percent of marginal expenditure Among the most important goods in this category are batteries, textiles, and household utensils

A broad income stimulus received by all peanut farmers will produce stronger demand-led growth through consumption expenditures than a stimulus received primarily by wealthy farmers

- The additional income generated by the overall sample is 13 to 30 percent greater per dollar of aggregate stimulus than that generated by wealthy households, depending on the breadth of the catchment area considered for assessing benefits

Increased income targeted toward poor and market village households will stimulate more growth through consumption expenditures than increased income that affects all households equally

- The additional income generated by the poor is 22, 44, and 74 percent greater than that generated by the overall population at the local, national, and regional definitions of tradability
- The additional income generated by market-village households is 18 and 27 percent greater than that generated by the overall sample at the local and national level, it is slightly smaller than the overall sample at the regional level

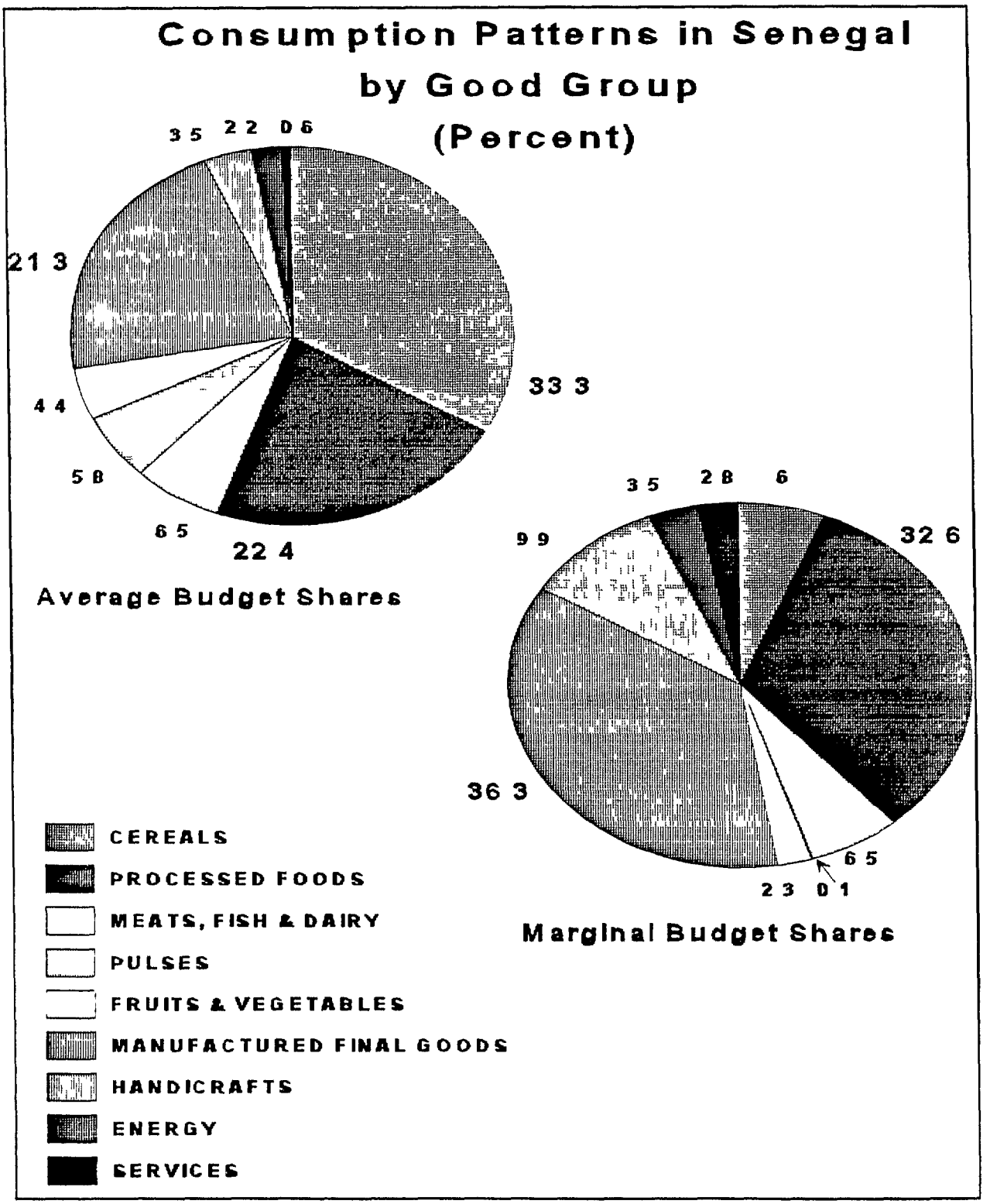
The key to realizing demand-led growth potential in Senegal lies in policies that ensure an increasing stream of rural income from farm exportables such as peanuts This rising income will lead to multiplied growth in other rural sectors, but depends on the following areas:

(1) an elastic supply of peanut seed,

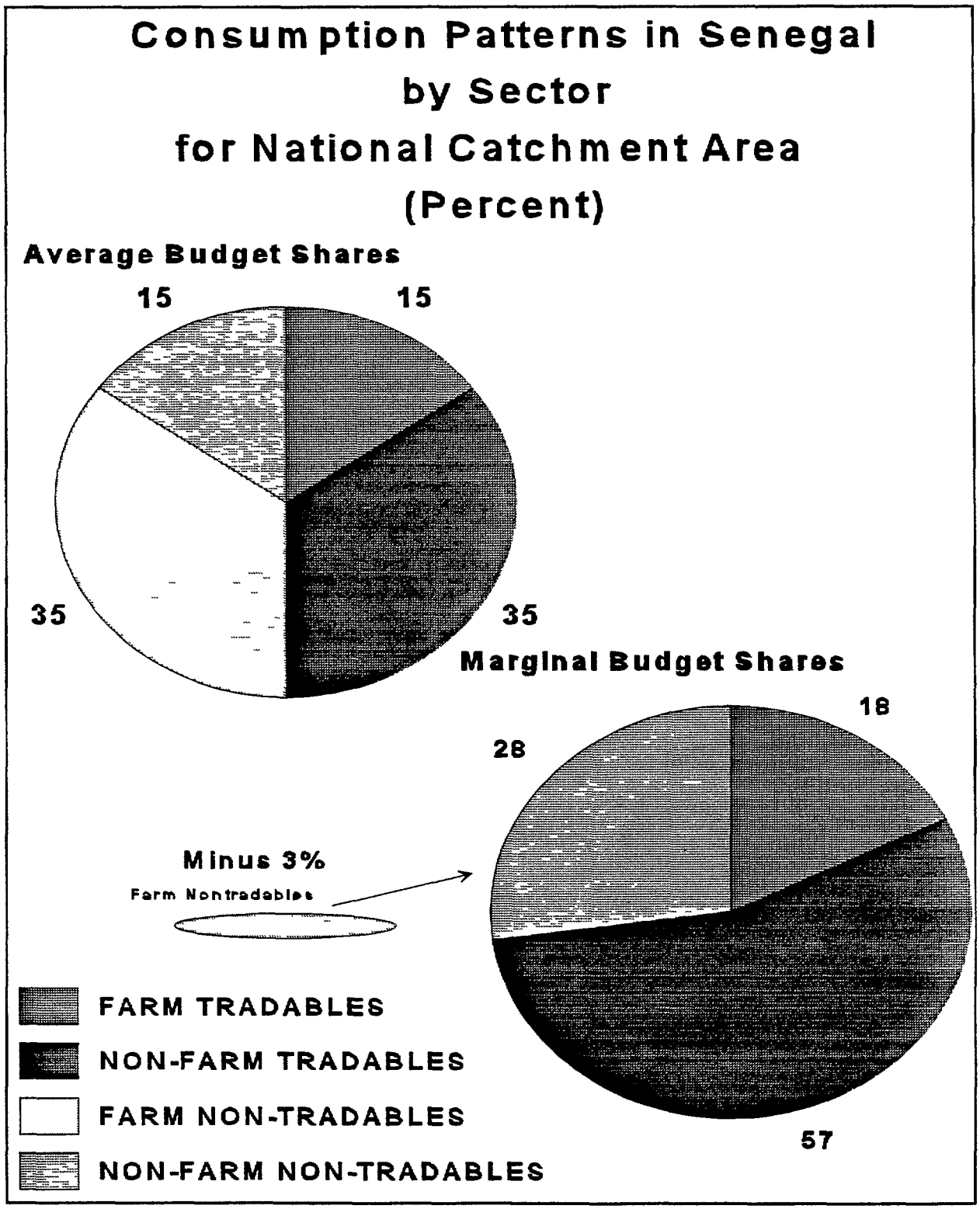
(2) expansion of rural production and repair services for animal traction equipment;

(3) an elastic supply of low cost cereals (local or imported) and livestock products

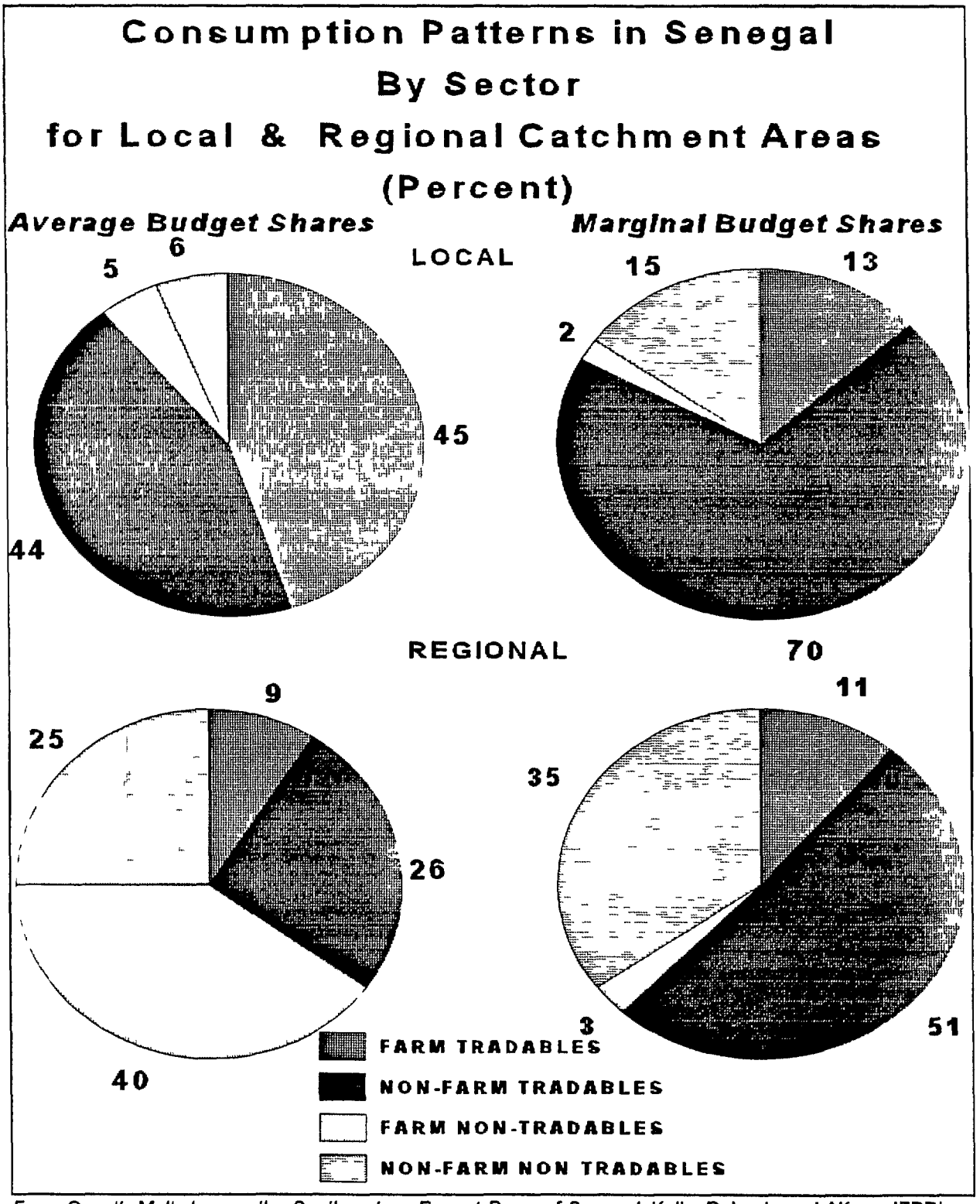
Explicit policy attention to these items is required as a matter of development strategy



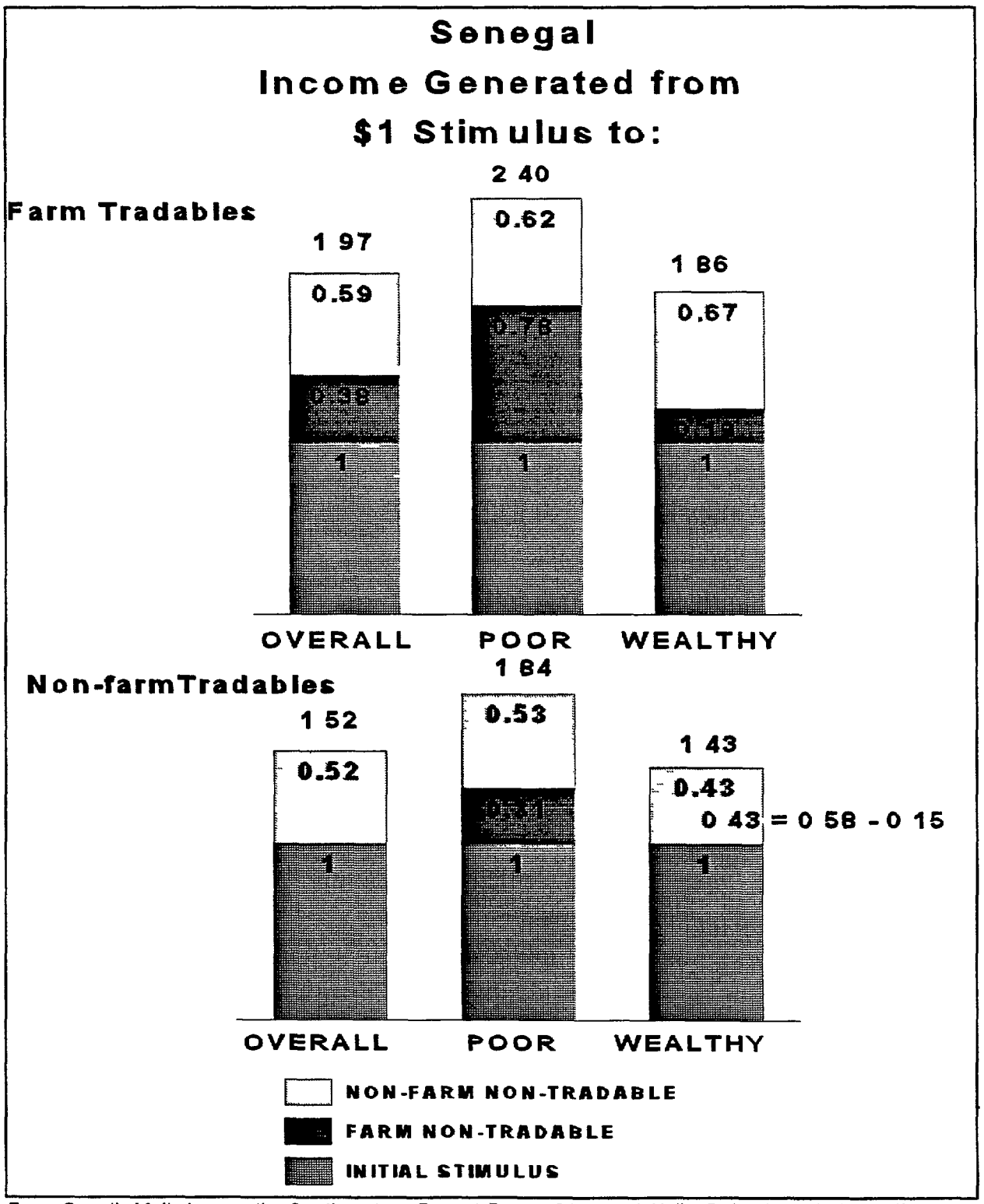
Farm Growth Multipliers in the Southeastern Peanut Basin of Senegal Kelly Delgado and Alfano, IFPRI May 16, 1994



Farm Growth Multipliers in the Southeastern Peanut Basin of Senegal, Kelly, Delgado and Alfano, IFPRI, May 26, 1994



Farm Growth Multipliers in the Southeastern Peanut Basin of Senegal, Kelly, Delgado and Alfano IFPRI May 26, 1994



Farm Growth Multipliers in the Southeastern Peanut Basin of Senegal Kelly, Delgado and Alfano, IFPRI, May 26, 1994

WORKSHOP ON AGRICULTURAL GROWTH LINKAGES IN SUB-SAHARAN AFRICA

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Rural-Urban Growth Linkages in Zambia and Zimbabwe

Peter B R Hazell and Behjat Hojjati

KEY FACTS

EASTERN PROVINCE, ZAMBIA

Despite low per capita incomes, a sparse population, and weak rural infrastructure, the rural nonfarm economy accounts for 18% of cash income and 8% of total income for the average farm household.

Seasonal labor demand for rural nonfarm activity peaks during the dry season when agricultural labor needs are minimum This countercyclical pattern helps avoid seasonal labor bottlenecks that might otherwise constrain nonfarm activity.

The average farm household

- Spent 1400 kwacha during the survey year (1985/88), of which 75% was allocated to household consumption needs and 25% to farm inputs
- Allocated 85% of total consumption expenditure to foods and only 15% to nonfoods
- Allocated 73% of total consumption expenditure to nontradable foods, including 35% for horticultural products (fruits, vegetables and legumes)
- Allocated only 3% of total consumption expenditure to nontradable nonfoods

As per capita incomes rise, the importance of nontradable horticulture (fruits, vegetables and legumes) and nontradable nonfoods increase in importance in total consumption expenditure Their marginal budget shares are 37% and 7%, respectively

The smaller sized farms use farm inputs more intensively than larger farms on a per hectare basis, and therefore have stronger production linkages to the local economy. However, larger farms have stronger consumption linkages and,

because these linkages are dominant, large farms also have stronger total demand linkages to the local economy

The regional income multiplier generated by an increase in value added in tradable agriculture is surprisingly large.

- Each kwacha of additional tradable agricultural income generates another 1 5 kwacha of regional income
- Most of the indirect income is generated in the nontradable agricultural sector, with little increase in nonfarm income
- If the supply of fruits and vegetables (which are nontradables) are assumed to be inelastic, then the multiplier is reduced by two-thirds to 0 4 kwacha
- The multiplier is nearly all due to consumption linkages and very little of it is due to production linkages
- The multiplier is larger for the plateau (2 57) than the valley (2 48) because of higher per capita incomes

At current per capita income levels, agricultural growth will lead to only modest levels of diversification out of agriculture in the Zambian study region However, the farm-nonfarm linkages might be strengthened by *(i)* investments in rural infrastructure and transport systems that better link the villages and towns, and *(ii)* continued policy reform to create a more enabling economic environment for the region's farmers and nonfarm entrepreneurs

The strong household demand linkages for nontradable agriculture could be a powerful force for regional economic growth This requires, however, that the supplies of many important nontradable foods, especially fruits and vegetables, must be elastic. If they are inelastic, then the size of the multiplier shrinks dramatically Agricultural research and improved marketing channels could play an important role in promoting the needed supply response

GAZALAND, ZIMBABWE

The Gazaland data provide a unique opportunity to compare the expenditure behavior of smallholder farmers on communal lands with large-scale, commercial farmers on private land.

About 40% of the smallholders report nonfarm activities as their primary occupation compared to zero for the commercial farmers.

The average smallholder in the communal areas had an annual per capita cash expenditure in 1987/88 of Z$180, compared to Z$1,165 and Z$4,736, respectively, for commercial farmers in Middle Sabi and Chipinge However, when converted to a per hectare basis, smallholders outspend commercial farmers by a ratio of 5:1

Commercial farmers spend much larger shares of cash expenditure on regional imports, such as farm machinery and implements, fuels and energy, and building materials Smallholders spend larger shares on food, personal services,

transport and other locally produced items, and may have stronger demand linkages for regional growth.

SALIENT DISCUSSION OF THE RESULTS AT THE WORKSHOP AND ELSEWHERE

Christopher L Delgado
December, 1994

Discussion of the work at the May 26 workshop was lively and focused Study results were also presented later at various locations in the United States and in Africa The following is a subjective attempt to note the major points of discussion from all these presentations, with a view to better seeing where to go from here

In general the study results have been very well received The enduring message that appears to have been of greatest interest to audiences is the argument that Africa's very high transfer costs for agricultural commodities matter greatly to the overall impact of different agricultural development strategies In the presence of such transfer costs, a good part of rural production is non-tradable This fact raises anew Ricardian visions of demand constraints on rural output The simple multiplier methodology used attempts to quantify the issue in a way that demonstrates that it matters

The policy message of the study has held up well in discussion Addressing the question raised at the May 26 workshop, "so what?" maximizing growth of incomes in rural areas of Africa requires a strategic approach that builds on the fact that much the continent is remote, poor, and badly linked to regional and global markets Under these conditions, it matters greatly where initial growth spurts occur Growth in production of non-tradables in isolation will only drive the price for these items down if local demand for these items, which constitute a significant share of African rural production, is not growing commensurately Economically-sustained rural growth in Africa must be based in the first instance on those things that shift the supply

curve for tradable agriculture to the right unit cost-cutting technological change and decreases in the costs of distribution to terminal markets The resulting growth in production of tradable items can occur without unduly depressing local prices for these items, because of trade, leading to local income growth That local income growth then leads to stimulating the local market for non-tradables, and under-used resources are drawn into that sector

Much of the discussion of the results has focused on the implications for policy of the assumptions that underlie the analysis, as opposed to the message itself or the appropriateness of the data generated As presented in the project documents and at the workshop, the analysis in the preceding paragraph and the numerical multipliers derived in the main report all depend on the assumption of an elastic supply response of non-tradables production with respect to relative prices In other words, when the demand curve for non-tradables shifts to the right because of higher rural incomes from export crops, more non-tradables are produced the supply curve for non-tradables is fairly flat This would not be true if the supply curve for non-tradables was fairly steep (inelastic with respect to prices) In that case, as the project reports make clear, the result of rural income growth from export cropping would be to make rural non-tradables very expensive relative to tradables, and pretty soon people would not want to produce more export crops

The project did not--and in fact could not--derive estimates of the elasticity of supply of non-tradables This would require a new project in itself Indeed, this information is frankly unknown in sub-Saharan Africa Given prevailing resource endowments and technology, the key issue is the elasticity of supply of rural labor and its determinants

One *a priori* view is that most of African agriculture is labor constrained, which suggests that it is unlikely that rural labor is available in elastic supply, as has been shown to be the case in much of rural South

Asia A better informed view is that much of African agriculture is indeed labor-constrained, but only *seasonally so* Seasonal labor constraints by definition imply that slack labor in terms of agriculture exists during non-peak periods Finally, some commentators pointed out that with population growth, particularly in Eastern and Southern Africa, land has become the constraining factor in the higher potential zones of these areas

Clearly, a better understanding of the conditions of labor supply to tradable and non-tradable activities in rural Africa is central to informing economically sustainable growth strategies In the absence of hard empirical evidence on rural labor supply elasticity for specific areas, the debate is likely to remain one of opposing opinions, with opposing conclusions that either export crops are a central engine of growth, or that they an ineffective way to promote sustained growth

A related point also surfaced in the discussion of the results, to the effect that there is very little empirical work *anywhere* (Asia not excluded) that measures *ex post* growth linkages econometrically, as opposed to *ex ante* prediction of linkages based on multiplier analysis An example of what is needed is found in the observation that in the Southern Burkina Faso cotton zone, women's income is particularly high, both relatively and absolutely compared to other areas of Burkina Faso, despite the fact that most of cotton income goes to men [2] *Ex post*, the cotton income to men greatly boosted income opportunities for women selling processed food and drink, handicrafts, local textiles and other non-tradables Rejecting cotton cultivation as being unfair to women would have greatly hurt the relative and absolute incomes of women in the zone Solid analytical and empirical documentation of these

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[2] See Thomas Reardon, Christopher Delgado and Peter Matlon, 'Determinants and Effects of Household Income Diversification Amongst Farm Households in Burkina Faso', *Journal of Development Studies*, (28) 2, January 1992

linkages is central to designing project activity that has a broad impact on target groups beyond direct distribution of project funds

Another key policy issue raised in the discussions concerned the usefulness of technological progress for non-tradable foods Under a strict partial equilibrium interpretation of the results, production increases from such progress would lead to a fall in the prices received by producers and a fall in their incomes (because of inelastic demand) An example would be those cases where big increases in production of perishable food crops in remote areas have led to losses rather than gains Although such cases have been observed in the past, such as maize rotting by the roadside in Northern Nigeria in the 1970's, it is conceivable that new technology would allow farmers to produce a given amount of a subsistence food crop with less land and labor, and thus to shift the saved resources into a tradable item for which there is an outlet The conclusion of this discussion is that policymakers need to take technological progress where they can get it, however, other things equal, it still pays to worry about what will be done with the extra output once it is produced

Another policy question raised in the discussion concerns what the research has to say about the determinants of rural investment in Africa in non-farm activities The modest approach in the present study does not directly deal with this question, although the authors of the country chapters have dealt with this issue elsewhere in other work The present research does point out an important consideration for programs designed to promote non-farm employment in Africa This is that most non-farm employment in Africa produces non-tradable goods or services Therefore, efforts to stimulate investment in this sector will work much better in growing cash crop areas than elsewhere, because of growth linkages Non-farm projects with growth and

employment objectives might first target cash crop areas, even though this might tend to exacerbate regional disparities in incomes

The question was raised as to what the results convey about how to achieve environmentally-sustainable rural growth in Africa Again, the project was not specifically targeted to this question, and must be modest in its conclusion in this regard Nevertheless, the linkages work does illustrate that growth in the production of rural tradables is central to creating rural employment outside of cropping Without such income growth, it is hard to see how rural people in increasingly densely populated areas can survive without continuing to grow subsistence food crops decreasing fallows and over-grazing increasingly sedentary herds

The latter point illustrates an assumption made in the project that the comparative advantage of rural areas (their exportables) were crops and livestock This is not central to the multiplier analysis, but is central to deciding which activities to promote first for multiplied growth The research could not explore the nature and determinants of comparative advantage in the rural areas studied, although this is clearly a high priority for future policy research

Finally, two issues surfaced in the academic discussion of the project and its results that suggest not over-interpreting the partial equilibrium results obtained and used for a specific illustrative purpose First, the detailed separation of items into "tradables" and "non-tradables" with respect to a specific set of borders, as done in the study, turns out to lead to analytically much richer results than the usual desk study assumption that all goods are tradable (or alternatively that manufactured goods are non-tradable, while agriculture is tradable) However, at the limit, every good is potentially tradable if the price is right, and few non-tradables are completely unsubstitutable by tradables Yet it is much worse to implicitly

assume perfect substitutability, as failure to take non-tradables into account would do The approach of the study to tradability stands as the least of several possible evils

Second, the use of three alternative definitions of borders for determining tradability (local zones, nations, multi-national regions) is only valid one zone at a time It is inconsistent to compare multipliers across different definitions of catchment area in order to make inferences that growth linkages are higher for a larger catchment area than for a smaller one This is because by definition a larger zone means that more items become non-tradables, guaranteeing higher multipliers for a larger zone Yet the same items cannot be both tradables and non-tradables at the same time in the present model (goods cannot be both supply and demand constrained), as comparing two catchment areas could suggest

For the same reason, it would be equally erroneous to conclude that multipliers could be maximized by dynamiting all roads, making everything a non-tradable Numerically, multipliers are higher if more items are non-tradable *cet par* , but in fact the greater the share of non-tradables, *cet par* , the lower the equilibrium level of income in the system, illustrating the difficulty of taking partial equilibrium analysis too far

The choice of catchment area is one of judgement of what is appropriate for the policies being considered and for the data used The policy analysis in the reports is all based on the middle definition of tradability across national borders This is a compromise between two facts First, many items consumed by rural people in the zones studied are non-tradables nationally, but not locally Second, as the catchment area is expanded beyond the local area, more and more actual linkages are not caught in the dataset, which only pertains to the local area The solution chosen gives useful insights for the purpose chosen, but that should not be pushed beyond that In particular, the

approach used illustrates the sensitivity of policy analysis generally--and multipliers in particular-- to assumptions about tradability, embodied in three alternate definitions of catchment zone