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EMPLOYMENT AND INCOME SOURCES OF THE RURAL POOR: MICRO-LEVEL INFORMATION FOR DEVELOPMENT OF POLICY PRIORITIES

Joachim von Braun
and
Rajul Pandya-Lorch
(eds.)

with contributions from:

Harold Alderman
Howarth E. Bouis
Neville Edirisinghe
Marito Garcia
David Hotchkiss
Eileen Kennedy
Shubh Kumar
Detlev Puetz
Thomas Reardon
Stephen A. Vosti
Graciela Wiegand-Jahn
Julie Witcover
Yisehac Yohannes

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ACKNOWLEDGEMENTS AND FOREWORD

This study is based on surveys to each of which many respondents in households, enumerators and researchers contributed. It required a large number of committed researchers - in addition to the paper contributors - and considerable effort by many to arrive at such new factual information on this "simple" issue: what are the income and employment sources of the rural poor? To individually acknowledge all of the researchers, who at some point helped to generate this information, in addition to the paper contributors, would make an excessive list here. We, instead, refer to the respective case study materials.

This study has been supported by the U.S. Agency for International Development. Joan Atherton in particular provided careful guidance and advice throughout the project. The study builds on 13 earlier studies carried out by IFPRI with its collaborators for specific different policy questions. A number of donors supported these earlier projects including the primary data collections. USAID, for instance, supported, partially or wholly, six of the earlier projects, and the Federal Republic of Germany and the International Fund for Agricultural Development each supported two projects. This research thus capitalizes on earlier research investments.

We consider this study to be a step toward comparative analysis at the micro level from which further research into household behavior and micro-macro linkages should emerge. The specific case study chapters, however, also stand on their own. Making the extensive household information available in this volume serves numerous purposes. Farming systems analysis, for instance, needs to be placed in a comprehensive household income - farm and non-farm - strategy perspective in order not to miss out on why households actually do what they do, before planning for farm income enhancement programmes. The micro case studies can provide valuable guidance to program designers and planners who too frequently rely on too rapid appraisals of rural income and employment conditions of the poor.

Joachim von Braun

SUMMARY

The Research Questions

Setting long-term priorities for development policy requires an in-depth knowledge of the patterns and tendencies of employment and income sources of the population. This research is stimulated by the preliminary insight that rural households, even if they are poor and/or located in so-called subsistence-oriented regions, do not always have farming as their primary occupation and, even if they do, are much dependent on a variety of non-farm and non-agricultural income sources. The scale and nature of these income sources and their relationship to the major economic sectors (agriculture, rural manufacturing, and services), through backward and forward linkages, need to be better understood for priority setting. The objectives of this study are threefold:

1) to identify socioeconomic characteristics, employment, and income sources of rural households in regions and countries at different stages of agricultural transformation and development;

2) to look into distributions below and above the poverty line as well as disaggregations, for instance, by socioeconomic categories, to identify relevant differences in demographic, income, and employment characteristics of poor and non-poor rural households and, thereby, assess the scope for "targeting" income sources of the poor as a poverty alleviation strategy;

3) to trace income and employment sources and strategies (as revealed by these) of rural households, and, thus, to broaden the information base for policy priorities for integration of the poor into a sustainable growth and development process.

Poverty is essentially, but not always, a matter of low incomes, where the cost of acquiring a certain commodity bundle determines the income or expenditure-based poverty line. An income-based indicator is an indirect means of measuring poverty. In this study, we try to measure poverty directly through consumption, given certain commodity characteristics and behaviors, rather than indirectly through incomes. A central and fundamental characteristic of absolute poverty is insufficient food consumption for an active and healthy life. The poverty line (cut-off point) is defined here by calorie consumption being 80 percent of the recommended consumption for an active and healthy life.

Theoretical and Conceptual Findings

New households economics theory goes a long way toward explaining household income strategies. Derived from a farm household model, we find income diversification driven by: the farm resource base; household work force (time); the off-farm wage rate and productivity in commercial and subsistence production; and consumption preferences/needs. Other driving forces toward household income diversification include differentials in opportunity costs of labor within households; and objective risks and (subjective) attitudes toward risks.

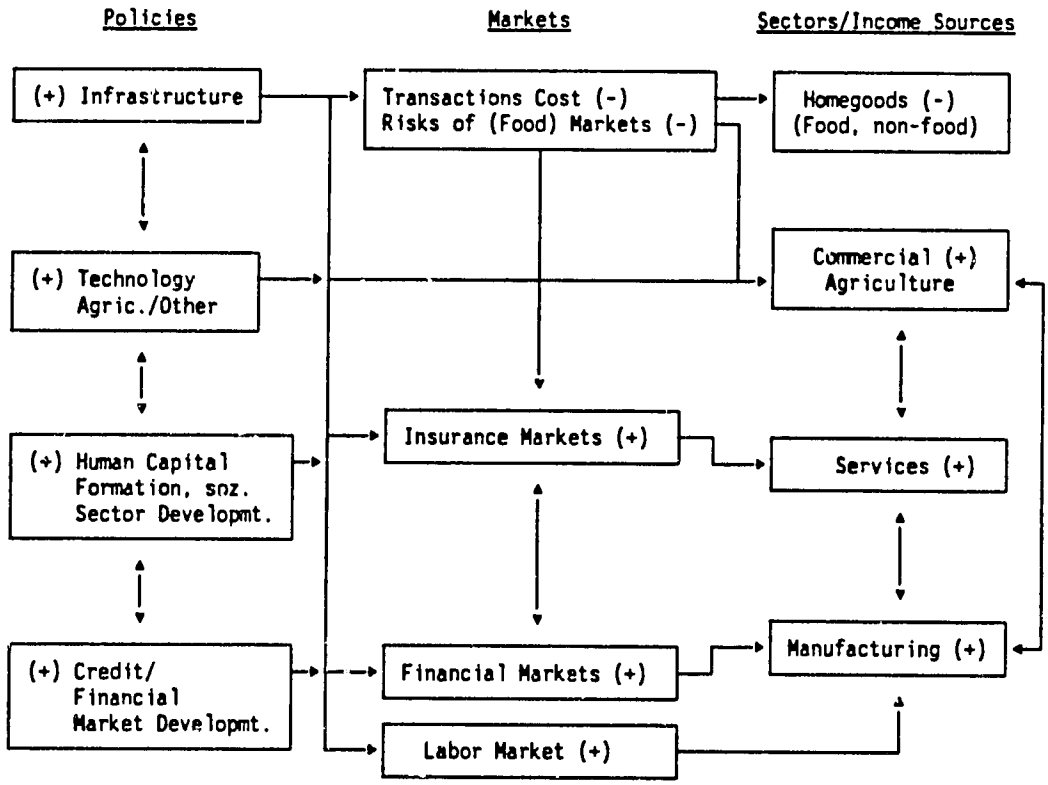
Income source diversification may thus be driven by the need to select a portfolio with elements of low co-variate risks. The costs of risk reduction for the combination of the different income earning activities may differ according to the uncertainties of activity-specific income variance in them. With increased gains from specialization in risky (commercial) farming, the demand for non-agricultural employment to reduce income variance also increases when insurance mechanisms are imperfect. Thus, farm specialization and off-farm labor supply by farm households may be partly in a reinforcing rather than a substituting relationship.

Static household models leave out the dynamic processes of policy/market interactions and their implications for sectoral diversification in the rural economy. Sectoral diversification in the development process is linked via market interlinkages and is impacted upon by policies (see Figure i.1). Key policies such as infrastructure improvements, technology, human capital formation, and credit market development result in reduced transactions costs and lower food market risks; in expansion of insurance, financial and labor markets; shrinkage of the home goods sector; and, expansion of commercial agriculture, rural services, and manufacturing.

Sectoral and Cross-Country Comparisons

There appears to be a tendency for agricultural income shares of the rural population to decline in the context of economic growth but this relationship is much less clear cut than the well-known relationship between agriculture income share and national income level. According to plausible estimates, agriculture contributes 41 to 55 percent of rural income in all major developing country regions, with the exception of Central America (34 percent). Africa is no exception (53 percent). Agricultural income forms the major share of total rural income in many low income countries, particularly in those with GNP per capita up to U.S. dollars 500. However, considerable diversity exists in the agricultural income share in rural income, ranging from about 30 to 90 percent, among this group of low income countries.

Figure i.1--Sectoral diversification, market, and policy links



\+ : increased resource allocation to...; expansion of...
\- : reduction of...

The general relationship between absolute poverty (here measured in terms of prevalence of malnutrition) and rural per capita income is strong, particularly in countries with per capita GNP per annum range of $200 to $800. Regression analysis shows that while increasing income reduces the prevalence of malnutrition overall, this effect is decreasing at the margin. According to model estimates, the prevalence of rural malnutrition is reduced by 14 percentage points, if income increases from $300 to $600, which means an about 40 percent reduction in the prevalence rates.

Alternative regression exercises which took account of the average agricultural income share in rural income in those countries included in the above analysis did not show a significant parameter for this variable. Thus, the sector structure—holding incomes constant—did not influence prevalence rates of malnutrition over and above the income level effect.

The Micro-Survey Settings

The 13 household-level surveys used in this comparative study represent a fair amount of differences in regional, ecological, and socioeconomic characteristics. The survey sites are located in Latin America (Brazil, Guatemala); Africa (The Gambia, Burkina Faso, Kenya, Rwanda, Zambia); and Asia (Sri Lanka, Pakistan, Bangladesh, India, Philippines). None of the surveys claims to be representative for the entire country in which it is located.[1] However, they do represent points of information on a range of different low-income rural settings.

All surveys were conducted in the 1980s and thus represent recent situations. They capture a fair amount of different economic environments and development policy contexts. Areas of more traditional subsistence orientation are represented, as are areas with improved infrastructure, with rapid technological change in agriculture, and with expanded non-farm employment. It is in terms of these categories, rather than in terms of "country cases," that the microlevel information should be perceived in this study.

Socio-demographic Characteristics of Malnourished Rural Poor (MRP) Households

Following the poverty concept underlying this study, poverty was defined in these household surveys in terms of food energy consumption (calories) falling below 80 percent of the recommended consumption for an active and healthy life. Furthermore, a category of severely

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[1] The Burkina Faso, Pakistan, and Bangladesh surveys are exceptions, with their rather broad coverage.

malnourished households was identified in terms of a cut-off point of 60 percent of recommended calorie consumption. Surveys have supplemented the calorie information with anthropometric information.

Household Size: MRP households tended to be larger than non-MRP households in these survey sites, although it was observed in several instances, such as in The Gambia and Pakistan survey sites, that severely MRP households were somewhat smaller than moderately MRP households. This could be indicative of either a coping strategy of paring down household size by sending out members to fend for themselves, or of limited labor resources to generate sufficient incomes and food. Furthermore, some MRP households, for instance, in the Philippines survey areas, were characterized by a younger age composition and a higher number of dependents.

Farm Size: While ownership of land appears to be an important factor for diet adequacy, the physical size of the farm itself (in hectares) does not seem to affect the prevalence of malnutrition as much. Either the farm sizes do not differ much by prevalence of calorie deficiency, such as in the survey sites of Guatemala, Kenya, India, and the Philippines, or there is a u-shaped relationship between farm size and hunger, as in the Zona da Mata survey site or even a positive relationship, as observed in the Eastern Province, Zambia, survey location. Farm size alone is not indicative of the quality of the land or, for that matter, of the ability to exploit production potentials, or its use as collateral in times of stress.

Landlessness or Quasi-Landlessness: Ownership of land or access to even small pieces of land for farming made a substantial difference to the poverty outcome. Generally, there tended to be a higher prevalence of poverty among the landless or quasi-landless households than in the sample as a whole. The landless were much more dependent on other (riskier) sources of income than farm incomes and on the diversification of the rural economy. For instance, 70 percent of the income of the landless in one Philippine survey location came from agricultural wages.

Landlessness was observed to be more prevalent in the Asian survey locations, and, not surprisingly, a much greater proportion of MRP households which were landless could be observed in the Asian survey sites (25 percent in Pakistan to 66 percent in Kandy District and North Arcot (1983/84)) than elsewhere. The comparable proportions were only 6 and 12 percent in Western Kenya and Northwest Rwanda, respectively. Similarly, a higher proportion of landless households was MRP in the Asian surveys (30 to 87 percent) than elsewhere, with the exception of the Rwanda site, one of the most densely-populated countries in Africa.

Female-Headed Households: Female-headed households were poorer than male-headed households, yet, they were sometimes better fed and absolute poverty was less prevalent among them than in the sample as a

whole. The control of income (and its resulting expenditure) is a determining factor. It is frequently suspected that women are more likely to spend more of their income on food and nutrition than men, who are more likely to spend their income on personal tastes. These findings are confirmed by some of the household-level surveys.

Female-headed households are not more apt to be MRP households (in comparison to the whole sample), except in the Southwestern Kenyan survey area and the Eastern Province of Zambia survey area. Otherwise, the gender of the household head was unimportant for distinguishing between MRP and non-MRP households. At the same time, again with the exception of Eastern Province, Zambia, female-headedness is not a marker for a significant problem in the food-poverty picture—only 2 to 7 percent of MRP households were female-headed. Hence, the scope for targeting for poverty alleviation on the basis of female gender of head of household appears to be limited in these survey sites, other than in Zambia. However, there is considerable scope for, and gains to be realized from efforts to raise women's incomes, especially in the African context, given evidence from the case studies that show that women tend to allocate their incomes for the family's welfare.

Income Composition and Strategy

Annual per capita household incomes (in 1985 US$) of severely malnourished households ranged from about $40 in North Arcot (India) during the drought year to about $716 in the Zona de Mata, Brazil. The diversity in income levels of the severely malnourished suggests against the adoption of a general or common income poverty line applicable across all countries or even across one country.

Rural households do not depend for income only or mostly on agriculture; in half of the survey locations, the non-agricultural income share of households is about or exceeds 50 percent. The share of non-agricultural income in total income ranges from 13 percent to 67 percent among the 13 surveys.

There is considerable diversity in income sources among the surveys, within the same survey, over time, and between MRP and non-MRP households among the surveys, although interestingly, in this last case, not so much within the same survey. Thus, there is little basis for making generalizations about income sources of the poor and non-poor households and for deriving blanket conclusions pertaining to income source targeting. For instance, among the surveys, income from livestock is notable only in Brazil, Pakistan, Bangladesh, and the Sahelian and Guinean zones of Burkina Faso, but inconsequential elsewhere. Crop production is quite important everywhere, except in Guatemala, the Sahelian zone (Burkina Faso), Sri Lanka, Pakistan, and one of the Philippines surveys. Wage employment is an important income source in the Guatemala, Sri Lanka, Pakistan, Bangladesh, North

Arcot (India), and the two Philippines surveys, which can be attributed to the agricultural structure and high population densities and consequent landlessness.

Within the same country, too, income sources and their contribution to total income, differ substantially by location. For instance, agro-ecological differences, combined with different government policies, contribute to such differences in Burkina Faso. Income from crop production is quite unimportant in the Sahelian zone (agro-climatically a very poor zone, with extreme variations in cropping outcomes) compared to the other two zones as distinguished in the Burkina Faso survey, which are somewhat better off. Instead, transfers and remittances are somewhat more important in the Sahelian zone, where they contribute almost one-third of income, particularly from non-local non-farm, i.e. migration income.

Neither are income source patterns steady over time, but rather they are dynamic, as they adjust to varying economic circumstances. During the drought year in North Arcot (India), agricultural wage income was a smaller share of total income, as employment opportunities on large paddy farms dried up. As the agricultural and overall economy improved following the drought, the share of income from agricultural wage employment increased considerably, as did income from services and trading. In The Gambia survey area, the opposite pattern was observed of off-farm income shares being inversely related to crop-production performance; i.e., the better the crop production, the lower the off-farm income share. This is related to the low share of agricultural wages in off-farm income. Therefore, in this context, it can be argued that high off-farm income shares are indicative of either an income diversification strategy or of poor agricultural performance.

Surprisingly, there is almost no difference in terms of the share of income coming from aggregated agricultural and non-agricultural sources for MRP and non-MRP households in each survey location. Only in North Arcot, India, during the non-drought year, did a substantial differential arise, when non-MRP households received 81 percent of total income from agriculture as opposed to the 63 percent share of MRP households.

However, differences do exist between MRP and non-MRP households in the shares of different income sources within the agricultural or non-agricultural sectors in some cases, especially where wage income appears to be a distinguishing feature of the income of the MRP, such as in survey sites in Guatemala, Rwanda, or North Arcot (in the non-drought period). In Guatemala, wages from agriculture and non-agriculture were 67 percent of income for non-MRP households, compared to 51 percent for MRP households.

Policy Conclusions

Non-agricultural income sources are quite important for the poor. Agricultural growth alone is not a sufficient long-term strategy for poverty alleviation. The poor are much linked to rural manufacturing with their direct income sources and expenditure patterns. Explicit promotion of manufactured goods availability in light of the incentive role they play for rural and agricultural growth, and fostering the complex synergistic feedback effects between agricultural and manufacturing growth through credit and infrastructure promise poverty alleviation effects beyond favorable agricultural growth effects.

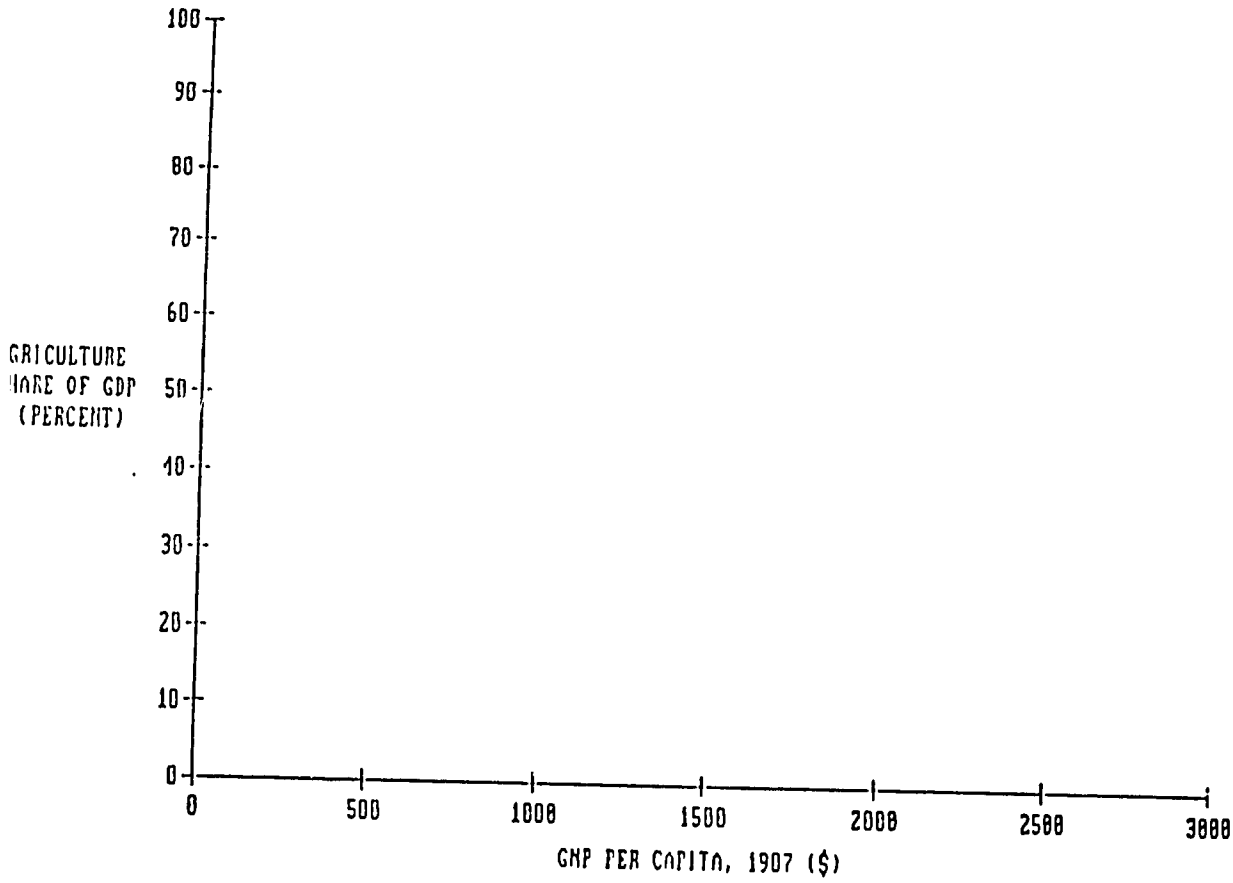
The diverse pattern of the poor's income sources, even in the same macro and micro regions covered by in-depth surveys, does not suggest a general blueprint of targeting the poor's specific income streams. The issue is more with alleviating the poor's problem of risky income streams.

There are two distinct motives underlying income diversification, depending on the nature of the rural economy: one, diversification in stagnating rural economies as a reflection of the poor's coping with income source specific risks (diversification for "bad" reasons); and two, diversification in growing rural economies as a reflection of dynamism and of capturing of gains from specialization at the household level (diversification for "good" reasons). To move swiftly from the former to the latter is a central task of rural growth strategy. Thus, targeting basic market failure and production instability problems, which have a major impact on the poor, may be more effective for poverty alleviation than direct targeting of the poor—be it on the consumption side or on the income earning side.

While hunger is addressed effectively with household income growth (and, possibly, income transfers), malnutrition requires community-level health and sanitation action, which is also facilitated and made sustainable by rural growth. Thus households need to be viewed in the community level context and the community has to attract much of the policy focus in many areas of development, such as infrastructure, health, and sanitation.

The analysis suggests a focus on: (1) Prevention of policy-induced market failures, i.e., in food and labor markets, which otherwise fosters income diversification for "bad" reasons; (2) Improved market integration through infrastructure, facilitating diversification of income sources for "good" reasons; (3) Social security with and before growth, in order to permit specialization by the poor in risky food and labor market environments. This includes community health and sanitation improvement; and (4) Rural growth promotion with technolo-gical change in agriculture and rural manufacturing to raise pro-ductivity and increase manufactured goods' availability at low prices.

Figure 1.1--National per capita income and share of agriculture in GDP, developing countries, 1987



Source: World Bank, World Development Report (Washington, D.C.: World Bank, 1989).

Table 1.1--Economic growth and change in agriculture sector share in developing countries, 1965-87

	GNP Per Capita Growth Rate (+)		GNP Per Capita Growth Rate (-) or stagnation
AGCHANGE (+)			Sierra Leone Uganda Madagascar Zaire Liberia Ghana Mauritania Bolivia Chad Tanzania
AGCHANGE (-)	Sri Lanka Uruguay Syria Algeria Morocco Tunisia Kenya Mexico Costa Rica Bangladesh Dominican Rep. Zimbabwe Congo Nepal Egypt China Brazil Panama Papua New Guinea	Cameroon Paraguay Ecuador Cote d'Ivoire Colombia Malawi Gabon Burkina Faso Thailand India Pakistan Honduras Nigeria Korea Rep. Indonesia Botswana Rwanda Philippines	Zambia Senegal Jamaica Nicaragua El Salvador Sudan Niger Argentina Peru Benin Ethiopia Togo Central African Republic

Source: World Bank, World Development Report (Washington, D.C.: World Bank, 1989).

Note: AGCHANGE = Agriculture sector share in GDP in 1987 minus Agriculture sector share in GDP in 1965

Table 1.2--Agriculture's position in the total and rural economy, developing country regions, 1987

Region[a]	RURAL POP (%)	GDPAG (%)	AGCHANGE (1965-87)	Range of Estimates (Percent) Agric. Income in Rural Income		
				INCSH1	INCSH2	INCSH3
Sub-Saharan Africa	72	32	-9	45	53	63
North Africa/Middle East	52	18	-6	34	41	50
Asia 1	74	30	-16	41	50	57
South Asia	74	30	-16	41	50	57
East Asia	63	24	-14	39	55	69
Central America/Caribbean	34	10	-6	29	34	44
South America	27	12	-8	46	48	73

Source: See Annex Table 1.1.

Notes:

RURAL POP = Rural population/total population

GDPAG = Share of agriculture in GDP

AGCHANGE = Agriculture sector share in 1987 minus (-) agriculture sector share in 1965

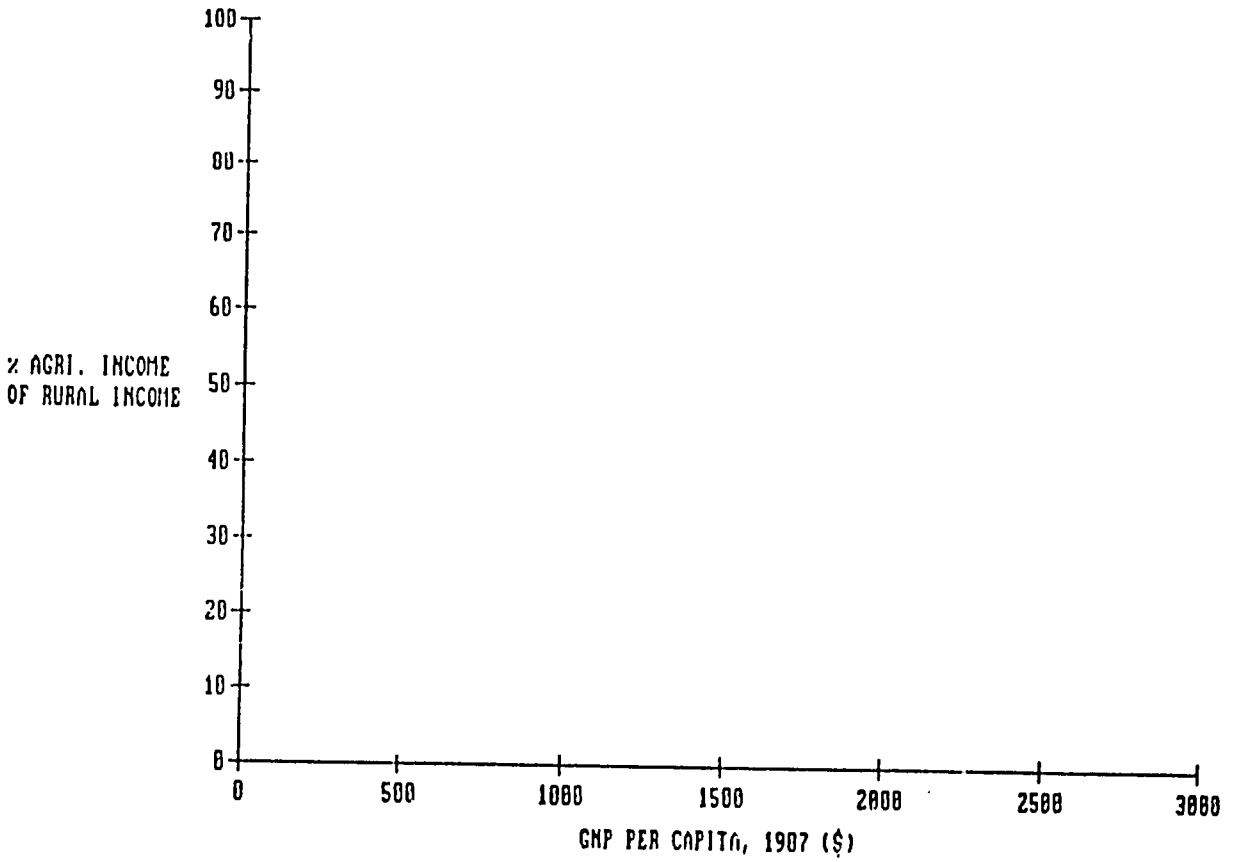
INCSH1 = (Agriculture GDP/Rural Population)/GDP per capita

INCSH2 = (Agriculture GDP/Rural Population) / ((Agriculture GDP/Rural Population) + (Services GDP/Population))

INCSH3 = (Agriculture GDP/Rural Population) / ((Agriculture GDP + Services GDP)/Total Population)

[a] For list of countries which form respective (population share-weighted) regions, see Annex Table 1.1.

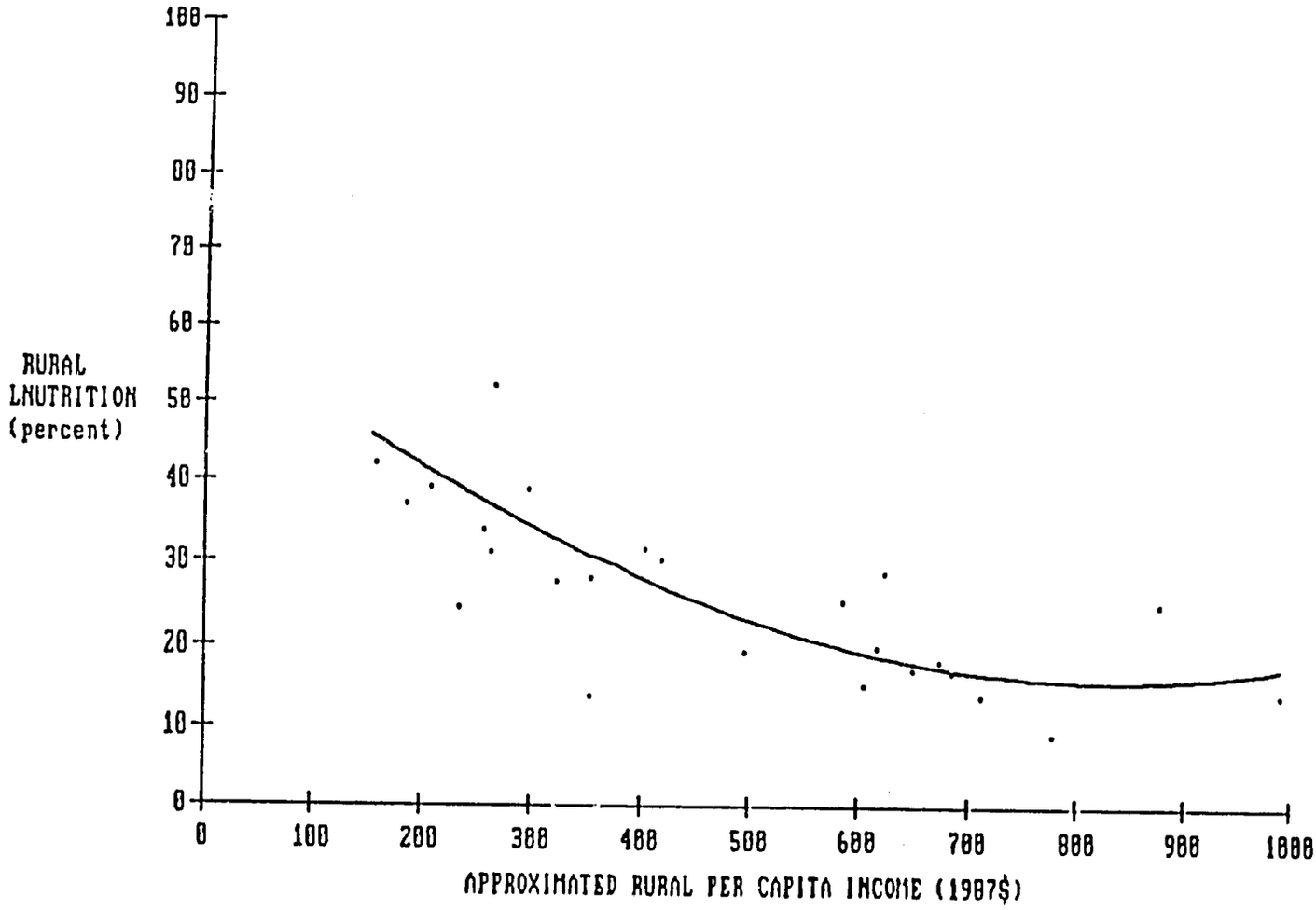
Figure 1.2--National per capita income and agriculture's share in <u>rural</u> income, developing countries, 1987



Source (GNP per capita): World Bank, <u>World Development Report</u> (Washington, D.C.: World Bank, 1989).

Note: For derivation of agriculture's share in rural income, see text.

Figure 1.3--Rural income and rural malnutrition in developing countries with GNP per capita of less than $1,200



Source: See Annex Table 1.1.

Note: The regression line results from Model 2 in Table 1.3.

Table 1.3--Regression analyses—rural malnutrition and income in developing countries

	Dependent Variable: Prevalence of Malnutrition (Percent of Underweight Preschoolers)				
Model 1:	-0.0787 GNP (-2.784)	0.0000369 GNP^2 (0.958)	3.548 DUMMY (0.91)	R^2 : 0.52	N: 29
Model 2:	-0.0943 RGNP (-2.684)	0.0000537 $RGNP^2$ (1.603)	3.817 DUMMY (0.97)	R^2 : 0.51	N: 29

Notes:

T-values in parentheses.

GNP: GNP per capita (1987 $).

RGNP: Rural GNP per capita (assuming that rural sector has no industry income) (1987 $).

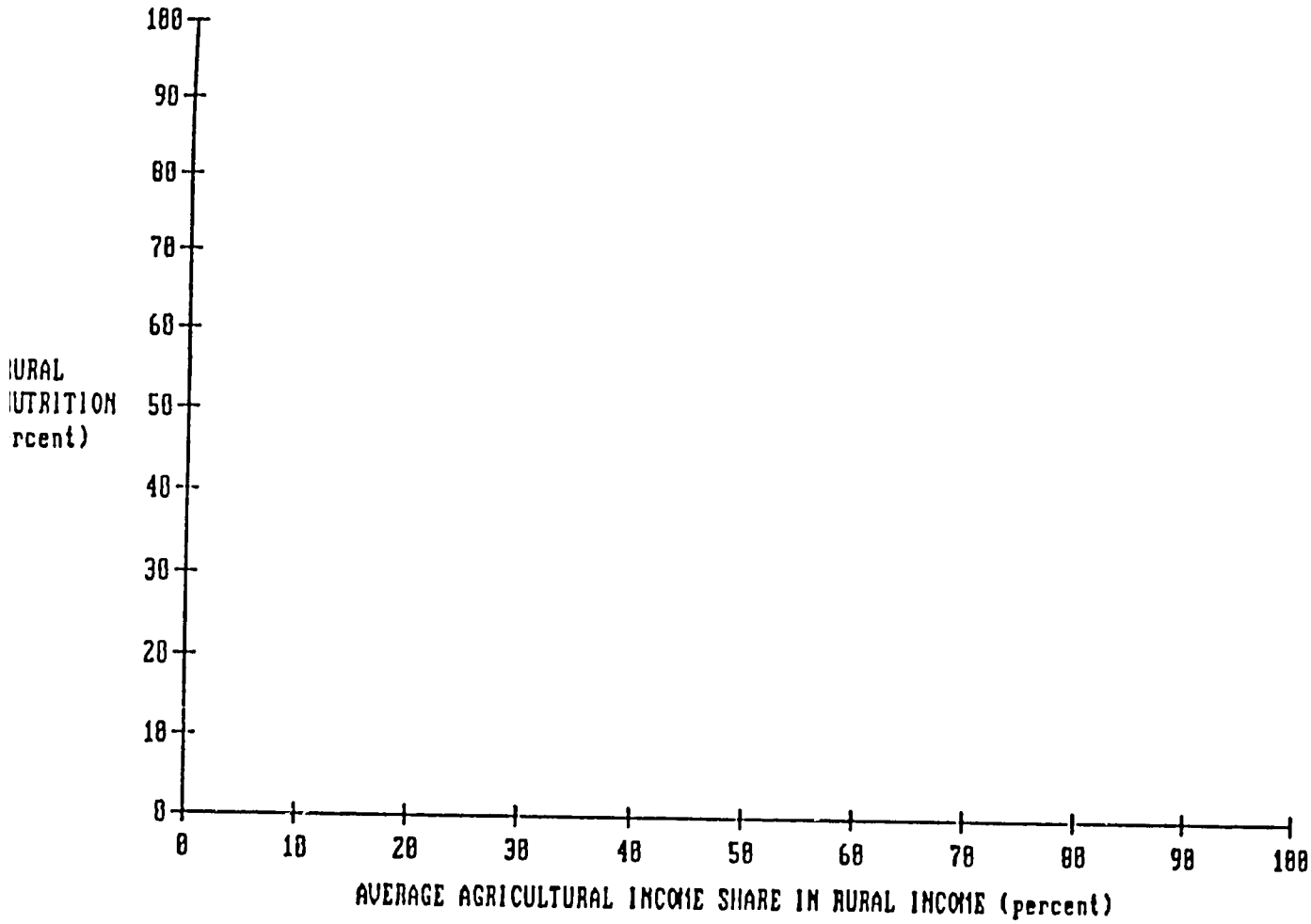
DUMMY: Dummy = 1 for those countries where prevalence of malnutrition was measured as percent of preschoolers below 80 percent of reference median weight-for-age standard; = 0 when it was measured as -2 Z-scores below weight-for-age standard.

Table 1.4--(Rural) income and nutritional improvement

	Increase in rural per capita income from from $300 to $600	
	Model 1	Model 2
Reduction in prevalence of malnutrition:		
Percentage Points	14	14
Percent	39	42

Source: See Models 1 and 2 in Table 1.3.

Figure 1.4--Agricultural income share and rural malnutrition in countries with GNP per capita of less than $1,200



Source: See Annex Table 1.1.

Table 1.5--A listing of major income categories/subsectors in rural areas of low income countries

1.	Home goods - Food
2.	Home goods - Non-food
3.	Commercial agriculture (self-employment and wages)
4.	Manufacturing (local; self-employment and wages)
5.	Services (local; self-employment and wages)
6.	Remittances of family (from urban or abroad)
7.	Transfers (public and community)

Figure 1.5--Allocation of household time between home goods production, farming for the market, off-farm earning, and leisure

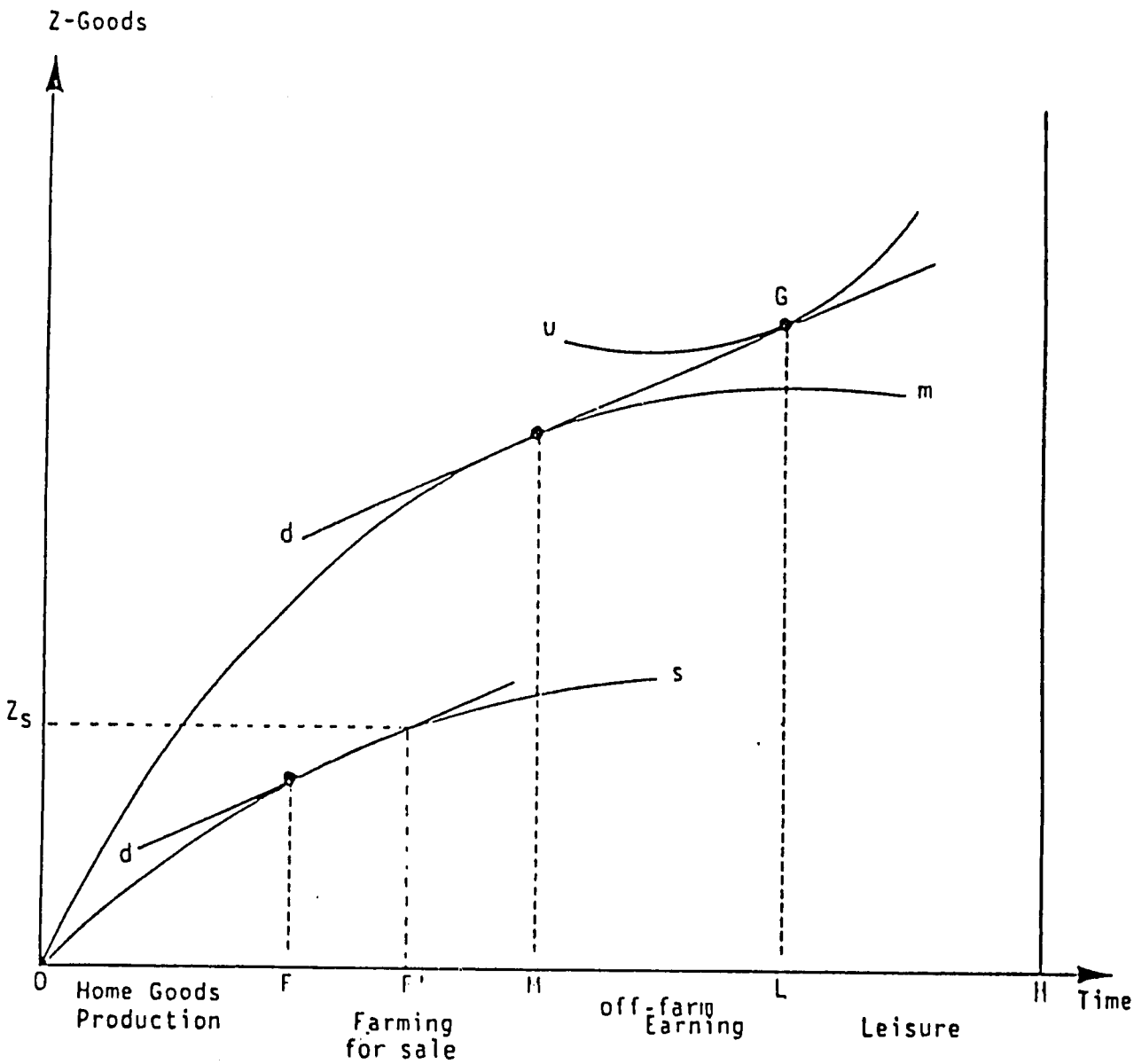
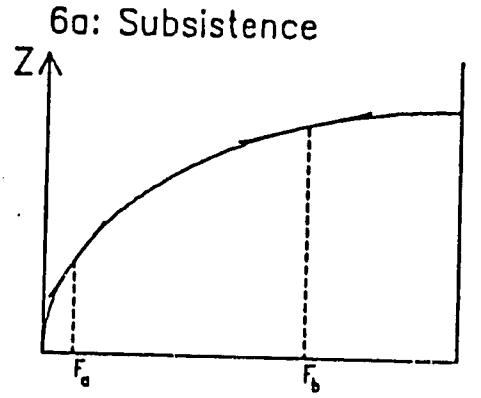
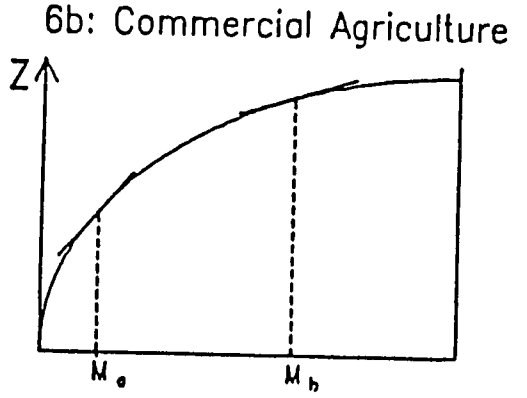


Figure 1.6--Allocation of household income when wage employment opportunities differ for household members





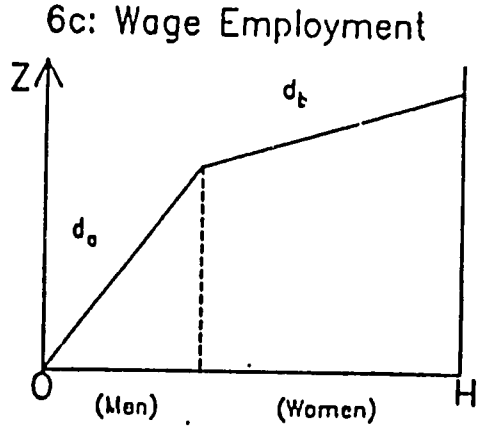
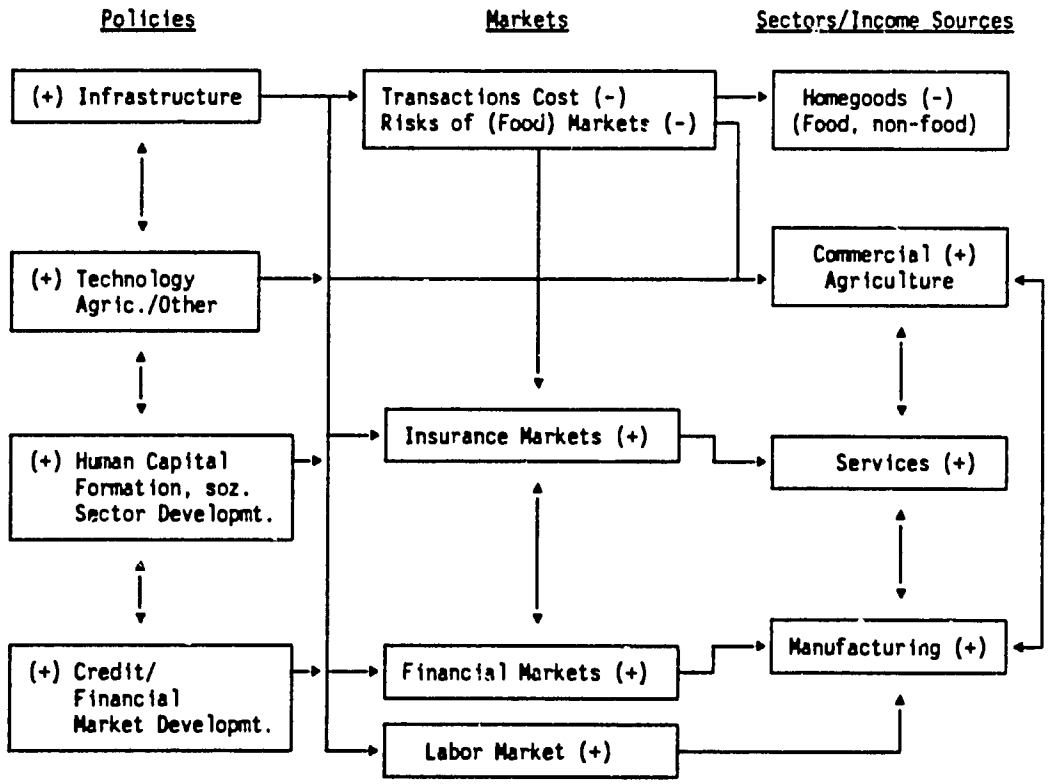


Figure 1.7--Sectoral diversification, market, and policy links



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\- : reduction of...

Figure 1.8--Location of Household Surveys

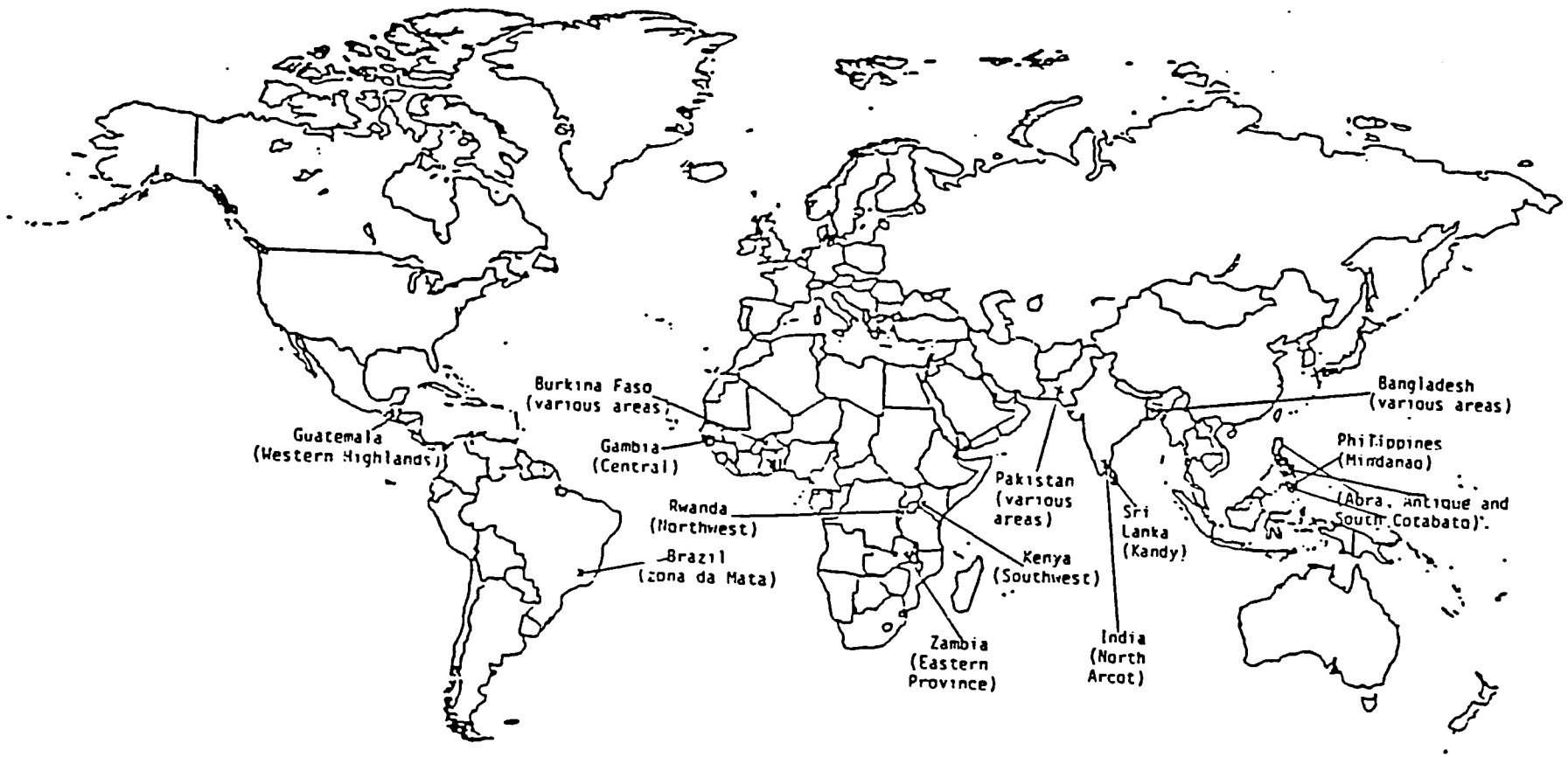

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Table 1.6--Basic survey design features

Survey Location	Year	Sample Size[a] (Households)	Duration of Survey	Collaborating Institutions
Zona da Mata - Integrated Rural Development Project (PRODEMATA), Minas Gerais, Brazil	1984	384	1979-84	University of Viçosa (Minas Gerais)
Western Highlands of Guatemala	Nov 1985-Jan 1986	180	3 months	Institute for Nutrition in Central America and Panama (INCAP); Cooperative "Cuatro Pinos," Guatemala
Central Gambia, 300 kms east of Banjul	1985/86 1987/88	212 270	10 months 6 months	Programming, Planning and Monitoring Unit for the Agricultural Sector (PPMU) (Now Department of Planning (DOP)
Six villages in Sudanian, Sahelian, and Guinean Zones, Burkina Faso	Sept 1984-Aug 1985	150	1 year	International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
South Nyanza Province, Kenya	June 1984-Mar 1985 Dec 1985-Mar 1987	504 462	9 months 15 months	Government of Kenya
Prefecture Gisenyi, Community Giciye, Northwest Rwanda	1985/86	189	11 months	Ministry of Agriculture, Rwanda; German Agency for Technical Cooperation (GTZ) project in Giciye
Eastern Province, Zambia	1986	722	1 year	Zambian National Food and Nutrition Commission; University of Zambia
Kandy District, Sri Lanka	June/July 1984	480	1 month	Food and Nutrition Policy Planning Division of the Ministry of Plan Implementation
Faisalabad and Attock Districts (Punjab Province), Badin (Sind Province), Dir (NWFP), and Mastung/Kalat (Baluchistan Province), Pakistan	1986/87	1,082	1 year	Applied Economic Research Centre (Karachi); Punjab Economic Research Institute (Lahore); University of Baluchistan (Quetta); and Applied Economic Research Centre (Peshawar)
Sixteen villages in major agro-ecological zones, Bangladesh	1982	563	1 year	Bangladesh Institute of Development Studies
North Arcot District, Tamil Nadu, India	1982/83 and 1983/84	126 70	14 months 12 months	Tamil Nadu Agriculture University
Mindanao, Bukidnon Province, Southern Philippines	1984/85	448	4 surveys, 16 months	Research Institute for Mindanao Culture
Abra, Antique, and South Cotabato Provinces, Philippines	May 1983-Sept 1984	792	4 surveys, 16 months	National Nutrition Council of the Philippines

Source: Case studies in this volume.

[a] In some case studies in this volume, these sample sizes are subsamples from the total samples.

Table 1.7--Socio-demographic characteristics of average households in the surveys

Survey Location	Household Size	Farm Size (ha)	Prevalence of Malnutrition[a] Percent of Households <80% Calories	<80% W/A	Percent of Households Headed by Women	Percent of Landless or Quasi-landless Households	Income Per Capita[b] (1985 U.S. $)
Brazil (Zona da Mata)	5.5	34.70	14.3	(39.3)[j]	8.9	12.2	829
Guatemala (Western Highlands)	6.4	0.67	24.6	77.4	2.0	24.4	377[l]
The Gambia (central region)	11.2[f]	4.16	18.4[f] 13.4[g]	61.0[f] 40.6[g]	0.0	0.0	283[f,l]
Burkina Faso (various areas)	11.0	0.72[c]	32.7	n.a.	n.a.	n.a.	104
Kenya (southwestern area)	9.5		29.6	21.8[k]	11.0	7.6	132 190
Rwanda (northwest)	5.5	0.74	40.7	43.8	11.1	14.8	71
Zambia (Eastern Province)	6.7	2.43[d]	38.8	29.8	25.7		
Sri Lanka (Kandy District)	6.0	0.49	48.0	49.0	15.1	56.7	122
Pakistan (various areas)	11.0		(56.5)[h]	49.3	0.0	25.8	217
Bangladesh (various areas)	6.6	0.94	17.6	79.9	1.8	21.5	153
India (North Arcot District) 1982/83	5.7	1.58	65.9	n.a.	0.0	43.7	44
1983/84	5.2	1.40	21.4	n.a.	0.0	47.1	90
Philippines (Mindanao)	6.8	2.6[e]	(64.6)[l]	(26.5)[k]	0.0	33.0	117
Philippines (Abra, Antique, and South Cotabato Provinces)	6.9	1.54	81.8	34.6	n.a.	42.2	187

Source: Case studies in this volume.

(continued on next page)

Table 1.7 (continued)

Note: Non-comparable figures in ( ).

n.a. = not available

[a] There is one weight-for-age standard among the surveys, but the calorie RDA levels (and corresponding cut-off points) are survey-specific. Also note that households with information on prevalence of malnutrition among preschoolers were usually a subsample of the households with calorie consumption information and, hence, the Z-score indicators were not directly comparable, since they referred to two separate but related samples.

[b] Per capita incomes from the Brazil, Pakistan, India, and Philippines survey sites were converted to constant 1985 U.S. dollars by inflating incomes (in local currency units) to the 1985 level, using Consumer Price Index and, then, applying the 1985 average periodexchange rate. The other survey sites already had incomes in 1985 levels. The exchange rates utilized were as follows: (1) Brazil--Cruzados 6.20/$; (2) Guatemala--quetzal 1/$; (3) The Gambia--dalasi 5.06/$; (4) Burkina Faso--francs 479.6/$; (5) Kenya--Kenyan shillings 15.78/$; (6) Rwanda--francs 101.26/$; (7) Zambia--kwacha 2.7i/$; (8) Pakistan--rupees 15.928/$; (9) Bangladesh--taka 27.99/$; (10) India--rupees 12.369/$; (11) Philippines--pesos 18.61/$. Source: International Monetary Fund, International Financial Statistics Yearbook (Washington, DC: IMF, 1989) and case studies.

[c] Land per adult equivalent.

[d] Total area cultivated.

[e] Average area cultivated per round.

[f] Wet season 1985/86.

[g] Dry season 1985/86.

[h] <2400 calories.

[i] Individual calorie intake of preschoolers.

[j] ≤-1 Z-scores.

[k] Percent of preschoolers.

[l] Expenditure per capita.

Table 1.8--Income levels of the MRP households relative to incomes of non-MRP households

Survey Location	Income Per Capita as Percentage of Income of >80% Category			
	Calorie Consumption		Anthropometric Status (w/a)	
	60-80%	<60%	60-80%	<60%
Brazil (Zona da Mata)	66.6	82.8	66.3[a]	40.2[b]
Guatemala[c] (Western Highlands)	60.4[d]	54.8	91.5[d]	81.5
The Gambia[c] (central region)	66.1	61.6	89.5	(s.s)
Burkina Faso (a) Sahelian Zone	62.2[e]	n.a.	n.a.	n.a.
(b) Sudanian Zone	40.0[e]	n.a.	n.a.	n.a.
(c) Guinean Zone	65.5[e]	n.a.	n.a.	n.a.
Kenya (southwestern area)	76.8	48.7	n.a.	117.9
Rwanda (northwest)	104.0	69.4	80.1	85.8
Zambia (Eastern Province)	53.2	34.2	109.3	59.2
Sri Lanka (Kandy District)	61.3	43.2	46.9	n.a.
Pakistan (various areas)	97.7[f]	72.3[g]	85.9	76.8
Bangladesh (various areas)	84.5	65.4	81.9	66.5
India (North Arcot District)				
(a) 1982/83	77.5	62.6	n.a.	n.a.
(b) 1983/84	120.7	(s.s)	n.a.	n.a.
Philippines (Abra, Antique and South Cotabato Provinces)	72.3	59.9	84.5	72.3

Source: Case studies in this volume.

s.s = Sample size of less than 10 households.

[a] -1 to 0 w/a Z-score

[b] ≤-1 w/a Z-score

[c] Expenditures per capita

[d] <80% of standard

[e] Households within 2 deciles below minimum adequacy

[f] 1600-2400 calories per person per day

[g] <1600 calories per person per day

Table 1.9--Income levels by category of malnutrition, 1985

Survey Location	Household Income Per Capita (U.S. $) 1985					
	Caloric Consumption			(Weight-for-Age) Anthropometric Status		
	>80%	60-80%	<60%	>80%	60-80%	<60%
Brazil (Zona da Mata)	865	570	716	858	568	345
Guatemala (Western Highlands)	419	253	230	388	355	316
The Gambia (central region)	302	199	186	279	250	(s.s)
Burkina Faso						
(a) Sahelian zone	115	79	72	n.a.	n.a.	n.a.
(b) Sudanian zone	111	72	44	n.a.	n.a.	n.a.
(c) Guinean zone	167	81	110	n.a.	n.a.	n.a.
Kenya (southwestern area)	213	163	104	193	n.a.	228
Rwanda (northwest)	74	77	52	70	56	60
Pakistan (various areas)	225	220	163	234	201	180
Bangladesh (various areas)	163	105	107	173	142	115
India (North Arcot District) 1982/83	65	44	41	n.a.	n.a.	n.a.
1983/84	96	90	(s.s)	n.a.	n.a.	n.a.
Philippines (Abra. Antique, and South Cotabato Provinces)	257	186	154	187	158	135

See footnote b in Table 1.7 and footnotes to Table 1.8.

s.s = sample size of less than 10 households.

n.a. = not applicable.

diversity of weed and work flow

prior environment

Fluctuations — exploitation opportunities

Brazil — GAP calculations

Table 1.10--Distribution of households in each survey region by off-farm income shares (percent)

Survey Location	Percent of Households in Each Region Off-Farm Income Shares			
	<10%	10-30%	30-60%	>60%
Brazil (Zona da Mata)	53.1	23.7	14.6	8.6
Guatemala (Western Highlands)	38.3	10.0	7.2	44.4
The Gambia (central region)	38.2	38.2	18.9	4.7
Kenya (southwestern region)	11.3	30.4	36.7	21.6
Rwanda (northwest)	17.5	20.1	29.1	33.3
Sri Lanka (Kandy District)	(s.s)	(s.s)	5.6	91.4
Bangladesh (various areas)	2.7	35.2	43.7	18.5
India (North Arcot District) (1982/83)	26.2	(s.s)	7.9	58.7
(1983/84)	21.4	(s.s)	(s.s)	65.7
Philippines (Abra, Antique and South Cotabato Provinces)	50.0	13.2	11.3	25.5

s.s = sample size of less than 10 households.

Table 1.11--Frequencies of income sources for three survey areas: Guatemala, The Gambia, and Rwanda

	Percentage of Households in each category					
	Number of Income Sources					
	1	2	3	4	5	6 or more
Guatemala						
Total sample	11.3	26.0	29.4	22.0	10.2	1.1
Non-malnourished	10.6	29.5	28.8	20.5	9.8	0.8
Moderately malnourished	8.7	13.0	34.0	26.1	17.4	0.0
Severely malnourished	18.2	18.2	27.3	27.3	4.5	4.5
The Gambia						
Total sample	0.0	0.5	2.4	14.2	41.5	41.5
Non-malnourished	0.0	0.6	2.9	13.9	38.2	44.5
Moderately malnourished	0.0	0.0	0.0	20.0	53.3	26.7
Severely malnourished	0.0	0.0	0.0	0.0	66.7	33.3
Rwanda						
Total sample	1.6	4.2	7.4	31.2	38.6	16.9
Non-malnourished	2.7	4.5	5.4	31.3	37.5	18.8
Moderately malnourished	0.0	2.3	6.8	36.4	40.9	13.6
Severely malnourished	0.0	6.1	15.2	24.2	39.4	15.2

Households are mixed bag — Gambian household is 2x Rwanda

Table 1.12--Off-farm income shares and calorie deficiency

Survey Location	Percentage of Households in Each Category with <80% Calories			
	<10% off-farm income	10-30% off-farm income	30-60% off-farm income	>60% off-farm income
Brazil (Zona da Mata)	12.7	12.1	19.7	(s.s)
Guatemala (Western Highlands)	18.8	(s.s)	(s.s)	28.8
The Gambia (central region)[a]	24.6	17.3	(s.s)	(s.s)
Kenya (southwestern region)	18.5	29.1	31.8	32.3
Rwanda (Giciye community)	36.0	29.1	38.0	52.0
Sri Lanka (Kandy District)	(s.s)	0.0	(s.s)	49.4
Bangladesh (various areas)	(s.s)	16.2	15.0	23.1
India (North Arcot District) (1982/83)	48.5	(s.s)	(s.s)	74.3
(1983/84)	0.0	0.0	0.0	32.6
Philippines (Abra, Antique, and South Cotabato Provinces)	80.1	86.9	76.5	84.9

s.s = Sample size of less than 10 households.

[a] Wet season.

Table 1.13--Income sources of malnourished and non-malnourished households, by survey location

		Percent of Household Income from										
		Non-Marketed Crops	Marketed Crops	Livestock	Agri-culture Wages	Total Agri-culture	Non-Agri-culture Wages	Crafts Work	Services Trading	Transfers/ Remit-tances	Other Income	Total Non-Agri-culture
Latin America:												
Brazil	MRP	50.0[a]		32.3	3.9	86.2	4.7[b]	-[b]	-[b]	9.0	-	13.7
	Non-MRP	49.8[a]		26.7	10.4	86.9	3.7[b]	-[b]	-[b]	9.3	-	13.0
Guatemala	MRP	20.1	7.2	-6.7[c]	22.3	42.9	43.7	-	3.9	9.5	-	57.1
	Non-MRP	13.4	13.3	-2.1[c]	18.2	42.8	33.1	-	14.6	9.6	-	57.3

[a] Aggregate of marketed and non-marketed crops.

[b] Aggregate of all off-farm non-agricultural income.

[c] Other agricultural income.

(continued)

Table 1.13--Income sources of malnourished and non-malnourished households (continued)

		Percent of Household Income from										
		Non-Marketed Crops	Marketed Crops	Livestock	Agri-culture Wages	Total Agri-culture	Non-Agri-culture Wages	Crafts Work	Services Trading	Transfers/ Remit-tances	Other Income	Total Non-Agri-culture
Africa:												
The Gambia	MRP	53.4	23.5	1.3[b]	1.2	79.4	2.8	3.3	9.4	6.0	-	21.5
	Non-MRP	58.4	26.8	0.7	0.7	86.6	1.8	1.6	7.9	3.2	-	14.5
Burkina Faso[l]												
Sahelian	MRP	29.5[a]	- [a]	19.0	3.7	52.2		13.3[h]	2.7[i]	30.5[j]	0.3[k]	46.8
Zone	Non-MRP	11.0[a]	- [a]	14.0	3.0	28.0		24.0[h]	8.0[i]	28.0[j]	12.0[k]	72.0
Sudanian	MRP	52.0[a]	- [a]	6.7	17.3	76.0		3.7[h]	4.3[i]	16.0[j]	2.0[k]	26.0
Zone	Non-MRP	63.0[a]	- [a]	10.0	0.0	73.0		7.0[h]	9.0[i]	6.0[j]	3.0[k]	25.0
Guinean	MRP	43.3[a]	- [a]	13.1	1.7	58.1		8.9[h]	17.9[i]	5.7[j]	7.5[k]	40.0
Zone	Non-MRP	32.0[a]	- [a]	20.0	2.0	54.0		13.0[h]	21.0[i]	2.0[j]	8.0[k]	44.0
Kenya	MRP	40.2	14.4		1.6	56.2	14.0	-	21.3	3.6	4.9	43.8
	Non-MRP	38.1	11.7	-	2.2	52.0	13.8	-	26.2	4.2	3.8	48.0
Rwanda	MRP	33.4	11.6	-	- [c]	45.0	16.4[c]	- [c]	- [d]	17.3	21.3[d]	55.0
	Non-MRP	28.7	11.5	-	- [c]	40.2	29.2[c]	- [c]	- [d]	10.9	22.8[d]	62.9
Zambia	MRP	73.4	18.3	1.5[e]	0.9[f]	- [f]	- [f,g]	- [g]	- [g]	- [g]	5.9[g]	
	Non-MRP	82.8	9.8	1.8[e]	1.5[f]	- [f]	- [f,g]	- [g]	- [g]	- [g]	3.6[g]	

[a] Aggregate of marketed and non-marketed crops.

[b] Other agricultural income, including livestock.

[c] Wage earnings and self-employment in labor, crafts work, and other income-generating activities.

[d] Included in off-farm income from other income-generating activities.

[e] Animal sales.

[f] Non-agricultural wages included in agricultural wages.

[g] All non-farm income aggregated under other income.

[h] Aggregate of cottage and gather manufacturing.

[i] Aggregate of services and food preparation.

[j] Aggregate of non-local non-farm income, food aid, intra-village gifts, gifts/aid imports, and income from abroad.

[k] Aggregate of income from transportation; cons and comm.

[l] >80% category is the sum of the medium and adequate consumption categories; <80% category is the low consumption category.

continued

Table 1.13--Income sources of malnourished and non-malnourished households (continued)

		Percent of Household Income from										
		Non-Marketed Crops	Marketed Crops	Livestock	Agri-culture Wages	Total Agri-culture	Non-Agri-culture Wages	Crafts Work	Services Trading	Transfers/ Remit-tances	Other Income	Total Non-Agri-culture
Asia:												
Sri Lanka	MRP	13.2[a]	- [a]	4.4	40.4[c]	- [c]	- [c]	-	-	18.32	23.7[d]	- [c]
	Non-MRP	7.4[a]	- [a]	1.2	50.9[c]	- [c]	- [c]	-	-	22.5	18.7[d]	- [c]
Pakistan	[e]	20.5[a]	- [a]	15.5	7.3	43.3	37.5[g]	- [g]	- [g]	14.0	6.2[h]	57.7
	[f]	23.7[a]	- [a]	14.0	5.7	43.4	35.6[g]	- [g]	- [g]	14.6	6.4[h]	56.6
Bangladesh	MRP	36.2[a]	- [a]	23.4[b]	3.5	63.1	8.9	9.2[i]	- [i]	18.6	-	36.7
	Non-MRP	27.9[a]	- [a]	17.1[b]	16.3	61.3	12.7	9.6[i]	- [i]	16.3	-	38.6
India 1982/83	MRP	50.7[a]	- [a]	-	23.0	73.7	16.4[j]	5.0[k]	4.7[l]	6.4	-6.2	26.3
	Non-MRP	30.4[a]	- [a]	-	35.2	65.6	18.8[j]	5.0[k]	2.7[l]	7.8	0.1	33.5
1983/84	MRP	40.6[a]	- [a]	-	40.5	81.1	4.1[j]	0.0[k]	6.9[l]	5.7	2.2	18.9
	Non-MRP[m]	-1.0[a]	- [a]	-	64.4	63.4	8.0[j]	0.0[k]	13.6[l]	12.4	2.7	36.7
Philippines I[q]	MRP	44.0	12.0	-	23.5	79.5	20.5	-	-	-	-	20.5
	Non-MRP	46.0	7.0	-	34.0	87.0	13.0	-	-	-	-	13.0
Philippines II[r]	MRP	20.0[n]	6.2[o]	10.1	3.2	39.5	10.5	22.5	7.8	6.2	13.5[p]	60.5
	Non-MRP	16.8[n]	6.1[o]	9.0	7.5	39.4	15.2	21.1	6.6	6.3	11.2[p]	60.4

[a] Aggregate of marketed and non-marketed crops

[b] Other agricultural income, including livestock

[c] Non-agricultural wages included in agricultural wages

[d] Non-monetary and miscellaneous income

[e] Households with >2400 calories per day

[f] Households with <2400 calories per day

[g] Non-farm income

[h] Rents and returns to capital

[i] Industry, trade, and crafts

[j] Factory work wages plus road work wages plus white collar wages

[k] Trade and craft wages

[l] Non-farm business income

[m] Households >100 percent calories

[n] Rice crops + maize crops farming

[o] Cash crop farming

[p] Fishing + rentals

[q] Mindanao, Bukidnon Province

[r] Abra, Antique, and South Cotabato Provinces