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Rural Income Generating Activities: A Cross Country Comparison

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Abstract:

This paper uses a newly constructed cross country database composed of comparable variables and aggregates from household surveys to examine the full range of income generating activities carried out by rural households in order to determine: 1) the relative importance of the gamut of income generating activities in general and across wealth categories; 2), the relative importance of diversification versus specialization at the household level; and 3) the influence of rural income generating activities on poverty and inequality. Analysis of the RIGA cross country dataset paints a clear picture of multiple activities across rural space and diversification across rural households. This is true across countries in all four continents, though less so in the African countries included in the dataset. For most countries the largest share of income stems from off farm activities, and the largest share of households have diversified sources of income. Diversification, not specialization, is the norm, although most countries show significant levels of household specialization in non-agricultural activities as well. Nevertheless, agricultural based sources of income remain critically important for rural livelihoods in all countries, both in terms of the overall share of agriculture in rural incomes as well as the large share of households that still specialize in agricultural sources of income.

I. Introduction¹

A widely accepted tenet of the development literature is that, in the process of structural economic transformation that accompanies economic development, the farm sector as a share of the country's GDP will decline as a country's GDP grows (Chenery and Syrquin, 1975). In rural areas, this implies that a shrinking agricultural sector and expanding rural non-farm (RNF) activities, as well as a changing definition of rural itself, should be viewed as likely features of economic development. The available empirical evidence unequivocally points out to the existence of a large RNF economy.² While few data sources exist which allow for consistent measurement of changes in RNF income and employment over time, available information points to an increasing role for RNF activities.³

It would be misleading, however, to see this growth in RNF activities in isolation from agriculture, as both are linked through investment, production and consumption throughout the rural economy, and both form part of complex livelihood strategies adopted by rural household. Income diversification is the norm among rural households, and different income generating activities offer alternative pathways out of poverty for households as well as a mechanism for managing risk in an uncertain environment. It is therefore useful, when thinking about rural development, to think of the full range of rural income generating activities (RIGA), both agricultural and non-agricultural, carried out by rural households. This can allow a better understanding of the relationship between the various economic activities that take place in the rural space and of their implications for economic growth and poverty reduction.

FAO (1998) characterizes three broad 'stages' of transformation of the rural economy. A first stage during which both production and consumption linkages between the farm and non-farm sector are very strong and rural-urban links still relatively weak. During this stage, the main non-farm activities tend to be mainly in areas upstream or downstream from agriculture. The second stage is characterized by a lower share of households directly dependent on agriculture, and greater rural-urban links. Services take off more strongly and new activities like tourism are started, while labor-intensive manufacturing in rural areas finds increasing competition from more capital intensive urban enterprises and imported goods. The third stage is characterized by a maturing of these trends: stronger links with the urban sector, migration and employment and income increasingly generated in sectors with little or no relation to agriculture.

In this context, the challenge for policy makers is how to assure that the growth of the RNF "sector" can be best harnessed to the advantage of poor rural households and how to identify

¹ The views expressed in this paper are those of the authors and should not be attributed to the institutions with which they are affiliated. We would like to acknowledge Marika Krausova for her excellent work in helping build the RIGA database and Genny Bonomi and Karen Hudlet for research assistance. We would like to thank Karen Macours, Alain de Janvry, Elisabeth Sadoulet, Derek Byerlee and Gustavo Anriquez for constructive comments on the text and data, as well as other numerous researchers for helping us check the data. We would also like to thank participants at workshops at the FAO in Rome and Santiago, the IAAE meetings in Brisbane and the AES meetings in Reading, for comments and discussion.

² See, among others, FAO (1998), Reardon, et al (2001), Lanjouw and Lanjouw (2001) and Haggblade et al, 2005)

³ Evidence in this direction is provided for Latin America by FAO (1998) and for Asia by Haggblade, et al (2005).

the mechanisms to best exploit synergies across agricultural and non-agricultural sectors. The growing consensus is that although agriculture continues to play a central role in rural development, the promotion of complementary engines of rural growth is of paramount importance. Yet, the poverty and inequality implications of promoting RNF activities are not straightforward. They depend on the access of the poor to RNF activities, the potential returns to RNF activities and the share of RNF activities in total income. Just as for agriculture, the ability of poor individuals and/or households to participate in potentially more lucrative RNF activities may be limited given barriers to entry in terms of liquidity or human capital constraints. When that is the case, a vicious circle may be established whereby poor households get relegated to low-return RNF activities that serve more as coping strategies than as a way out of poverty. Promotion of RNF activities may then leave poor household behind and exacerbate rural income inequality.

The general objective of this background paper is to analyze rural income generating activities in order to contribute to the design of more effective and better targeted rural development policies. The specific objectives are to examine the full range of rural income generating activities carried out by rural households in order to determine: 1) the relative importance of the gamut of income generating activities in general and across wealth categories, both at the level of the rural economy and the rural household; 2), the relative importance of diversification versus specialization in rural income generating activities at the household level; and 3) the influence of rural income generating activities on poverty and inequality.

While there has been some focus in recent years on rural non-farm activities in the development literature, most of which are cited in this paper, a number of limitations suggest the need for further work. First, most of the previous literature has focused on the diversification into rural non-farm activities at the level of the rural economy. This is usually done by gauging the shares of different income sources over the rural population or over groups of rural households. This paper instead stresses the diversification and specialization of income generating strategies at the level of the rural household.

Second, the methodologies of past efforts have typically not been comparable across countries. For example, Lanjouw and Feder (2001) note that much of the observed variation among countries in the share of RNF activities stems from weaknesses in the data being used since for many countries data are outdated or missing altogether while for others, the only available data are often case studies of limited geographical reach and therefore not nationally representative. For those other countries for which nationally representative data are available and fairly recent, country specific studies typically use idiosyncratic methodologies which are not comparable with similar studies in other countries, as individual researchers tend to use definitions and methods tailored for a country in question.

In order to address directly these data concerns, this paper takes advantage of a newly constructed cross country database composed of comparable variables and aggregates from selected high-quality household surveys, which we refer to as the RIGA database. The RIGA database allows for a systematic analysis of data from a range of countries and thus greater confidence in the comparability of results.

To meet the objectives of this paper, the following areas are covered. In Section II, we describe the RIGA database. In Section III, we analyze the participation of rural households in rural income generating activities and the share of income from each activity in household income, over all households and by expenditure quintile. In Section IV we move from the

level of the rural space to that of the rural household, examining patterns of diversification and specialization in rural income generating activities, again over all households and by expenditure quintile. In Section V, we decompose income inequality by income source, for all countries, using the Theil index. Conclusions are then presented in Section VI.

II. Description of the RIGA database

The analysis presented in this background paper utilizes the RIGA database, which is constructed from a pool of several dozen Living Standards Measurement Study (LSMS) and other multi-purpose household surveys made available by the World Bank through a joint project with FAO.⁴ From this pool of possible surveys, the choice of particular countries was guided by the desire to ensure geographic coverage across the four principal development regions – Asia, Africa, Eastern Europe and Latin America –, as well as adequate quality and sufficient comparability in codification and nomenclatures.

Using these criteria, survey data from the list of countries in Table 1 were utilized. Each survey is representative for both urban and rural areas; only the rural sample was used for this analysis. While clearly not representative of all developing countries, the list does represent a significant range of countries and regions and has proved useful in providing insight into the income generating activities of rural households in the developing world.

Table 1. Countries included in the analysis

Eastern Europe	Africa	Latin America	Asia
Albania, 2005	Ghana, 1998	Guatemala, 2000	Bangladesh, 2000
Bulgaria, 2001	Madagascar, 1993	Ecuador, 1995	Indonesia, 2000
	Malawi, 2004	Nicaragua, 2001	Nepal, 1996
	Nigeria, 2004	Panama, 2003	Pakistan, 2001
			Vietnam, 1998

Once the countries were selected the next critical step was to construct income aggregates that were comparable across countries.⁵ This required resolving a host of issues that arose in the construction of the aggregates. The first key choice relates to the definition of rural and, correspondingly, which households are considered rural households for the analysis. Countries have their own unique mechanisms of defining what constitutes rural. However, government definitions tend not to be comparable across countries and this may make differences in results driven by the fact that rural is not being defined in the same way. On the other hand, it may make sense to use government definitions since presumably this definition reflects local information about what constitutes rural and is the definition used to administer government programs. While recognizing the potential problem with using country-specific definitions of rural, the available survey data do not allow for a straightforward alternative definition and therefore the government definition of what constitutes rurality is used.

A second choice is to determine how to disaggregate income data in a manner that is consistent across countries. One common initial division is between agricultural and non-agricultural activities although defining this distinction in a concise manner is potentially

⁴ A more detailed description of the database can be found in a longer version of this paper (Davis, et al 2007).

⁵ Details of the construction of the income aggregates can be found in Carletto, Covarrubias and Krausova (2007).

problematic. A second common division of income, for both agriculture and non-agricultural activities, is between wage employment and self-employment. Additionally, transfer payments, either from public or private sources may be included. For this study, seven basic categories of income have been identified for analysis: 1) crop production income; 2) livestock production income; 3) agricultural wage employment income, 4) non-agricultural wage employment income; 5) non-agricultural self employment income; 6) transfer income; and 7) other income. For some of the analysis, transfer income is further divided into public and private sources. In addition to this classification, non-agricultural wage employment income and non-agricultural self employment income have been further disaggregated by industry using standard industrial codes.

Although these seven created categories form the basis of the analysis, in certain cases these are aggregated into higher level groupings depending on the type of analysis being carried out. In one grouping, we distinguish between agricultural and non-agricultural activities. In this case, the first three categories (crop, livestock and agricultural wage income) make up *agricultural* activities while the latter four (non-agricultural wage, non-agriculture self employment, transfer and other income) represent *non-agricultural* activities. In a second grouping, we refer to the first two categories (crop and livestock income) as *on-farm* activities, categories 4 and 5 (non-agricultural wage and self employment income), as *non-farm* activities, and leave agricultural wage employment, transfer and other income as separate categories. Finally, we also use the concept of *off farm* activities, which includes all non agricultural activities plus agricultural wage labor.

For each of the countries listed in Table 1, income aggregates for rural households were created as described. Furthermore, a comparable set of household variables—including demographic characteristics, asset endowments and access to infrastructure and institutions—was created in order to facilitate the analysis of the data. As with the income aggregates, these variables were also created in a comparable manner across countries. As an indicator of welfare levels we used the consumption expenditure aggregates that accompanied each dataset, each of which had been constructed in a largely comparable fashion according to widely accepted and internationally recognized criteria. The final set of data used for this analysis includes 15 nationally representative, comparable datasets with a consistent set of variables.

III. Rural diversification of income sources

The majority of studies in the existing literature on rural non-farm activities focus on the diversification of income sources over rural space, or over groups of households within the rural space. To examine rural diversification, we begin by looking at the share of income from rural income generating activities as well as household participation rates in the different rural income generating activities. At this level of analysis, the RIGA data reveal high levels of rural diversification in terms of income sources in most countries. Yet, rural diversification clearly does not necessarily mean complete abandonment of on-farm crop and livestock activities, as most rural households in most countries maintain on-farm activities, despite participation in other off farm activities. Following the general discussion of rural income generating activities, we look more closely at rural non-farm activities and the range of industries in which households participate, finding that even within this sector activities vary greatly. A similar detailed analysis of transfers follows to determine the relative importance of public and private transfers which shows significant variability across countries. Finally, the

relationship between wealth status and rural income generating activities is examined using expenditure quintiles. The results highlight the fact that certain activities tend to be more closely associated with economic status.

Figure 1. Percent of total income, by on-farm activities, agricultural wage employment, non-farm activities and transfers

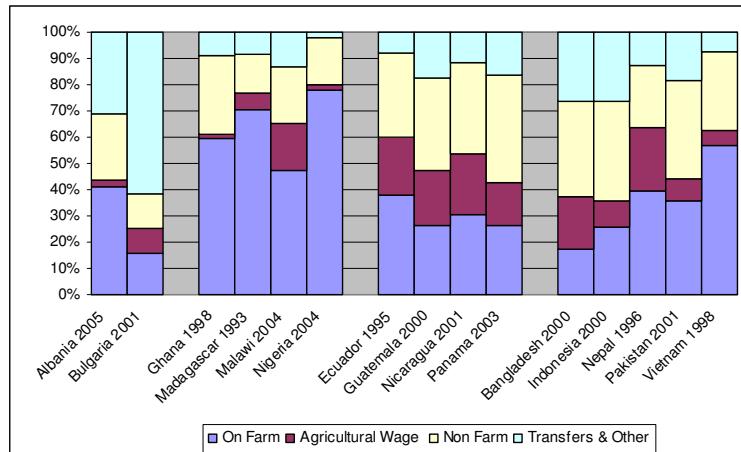
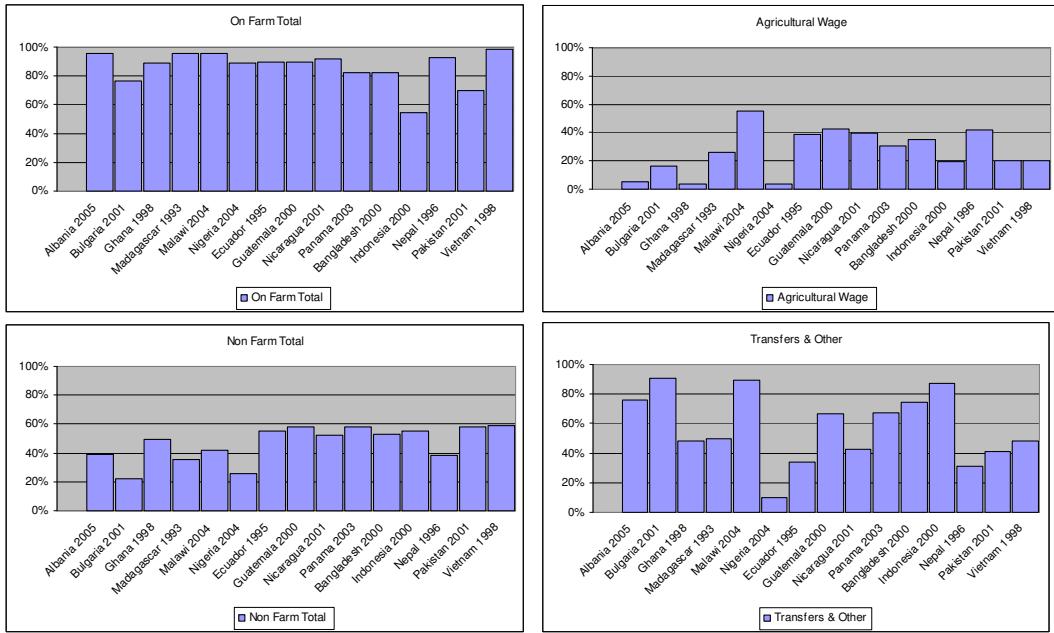


Figure 1 shows the share of income by source and suggests that off farm sources of income account for more than 50 percent of rural income in a majority of the RIGA countries (11 of 15 countries). This is true of all of the countries from Eastern Europe and Latin America and for all but Vietnam for Asia. Overall, off farm sources of income represent between 22 and 84 percent of total income, with an average value of 58 percent. Excluding agricultural wage income from these calculations, non-agricultural income ranges from 20 to 75 percent of total income, or 47 percent on average. Not surprisingly, on-farm sources of income tend to be more important for the African countries, there the share ranges from 48 to 77 percent of total income.

Figure 2. Percent of rural households participating in on-farm activities, agricultural wage labor, non-farm activities and transfers



While rural non-farm activities are important, thus meriting the increased attention which they have received in the literature and policy debates, the vast majority of rural households among the RIGA dataset countries still maintain on-farm production. This can be best seen in Figure 2 which shows participation rates in different income generating activities. In all countries but one (Indonesia), about two thirds of rural households participate in on-farm activities and in 12 countries the percentage is above 80 percent.⁶ While for some of these households the importance of this participation is relatively minor, since it includes holding a few small animals or patio crop production—an issue we take up later in the section on household diversification—agriculture continues to play a fundamental role in rural household economic portfolios. For non-agricultural activities and transfers, the range of participation ratios across countries is much greater, though in both cases, in most countries the rate is at least 40 percent, including all of the Eastern Europe and Latin American countries. The high incidence of participation in both agricultural and non-agricultural activities points to highly diversified RIGA portfolio at the household level. We explore the extent of this household-level diversification in Section IV.

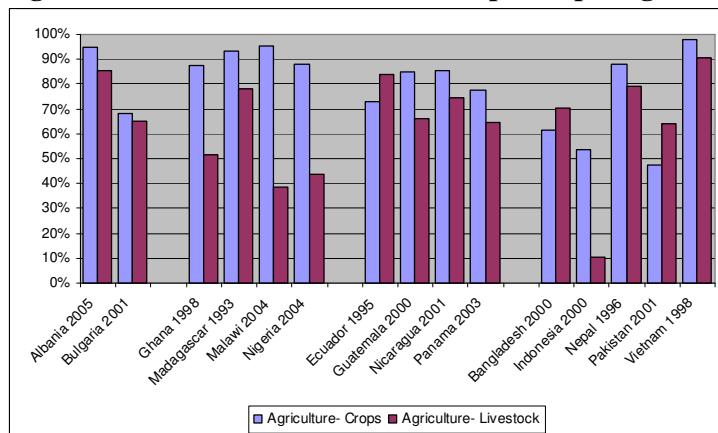
Disaggregation of rural income generating activities

As a next step we look in more detail within the farm and non-farm sectors. Figure 3 presents participation rates in the main agricultural activities—crops and livestock. Similar patterns emerge. Most countries (12 of 15) have at least two-thirds of rural households participating in the production of crops. Livestock activities are only slightly less common, and all countries, except Indonesia and Nigeria, have at least half of rural households participating in livestock activities. In contrast (Figure 2), participation in agricultural wage labor shows much more variation. Relatively few rural households in Eastern Europe work in agricultural wage labor; while 20 to 40 percent do so in Latin America and Asia. Variation is greatest in Africa where

⁶ Participation is defined as the receipt of any household income (negative or positive) by any household member from that income generating activity.

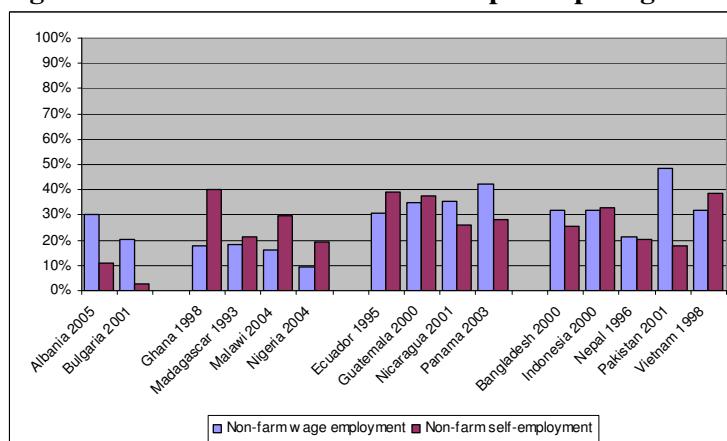
few households work in agricultural wage in Ghana and Nigeria while over 50 percent work in agricultural wage labor in Malawi.

Figure 3. Percent of rural households participating in on-farm activities



Participation rates in non-farm activities are further disaggregated into non-agricultural wage employment and self employment in Figure 4. While the rates of self employment participation are lowest for the Eastern Europe region, in the other regions participation rates are generally high for this category and either exceed or mirror those for non-agricultural wage employment. Wage employment is clearly important for most regions, with more than 20 to 40 percent of households participating in all countries with the exception of Africa, where the range is from 10 to 20 percent. Non-agricultural wage employment is particularly important for rural households in Latin America and for most countries in Asia.

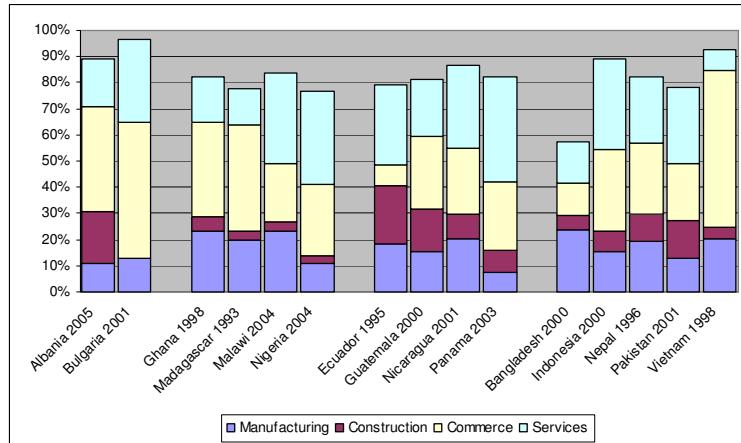
Figure 4. Percent of rural households participating in non-farm activities



The non-farm wage and self employment component of non-agricultural income can be further broken down indicating which industries tend to be more important in the non-farm economy. Eight sectors in wage employment are identified –mining, manufacturing, utilities, construction, commerce, transport, finance, services and other, and nine in self employment with the addition of agriculture and fish processing. These sectors could be even further disaggregated revealing a broad range of industrial activities in which households are occupied. Focusing on the broader industrial sectors and considering non-agricultural wage and self employment activities together, Figure 5 shows respectively the share of non-farm

income in the four most common components. As can be seen from the figure, commerce and services in most cases represent the largest sectors of rural non-farm income with a simple mean across countries of 32 and 25 percent of non-farm income. Manufacturing is next in importance followed by construction. Services are particularly important in Latin America while commerce is more important in Eastern Europe.

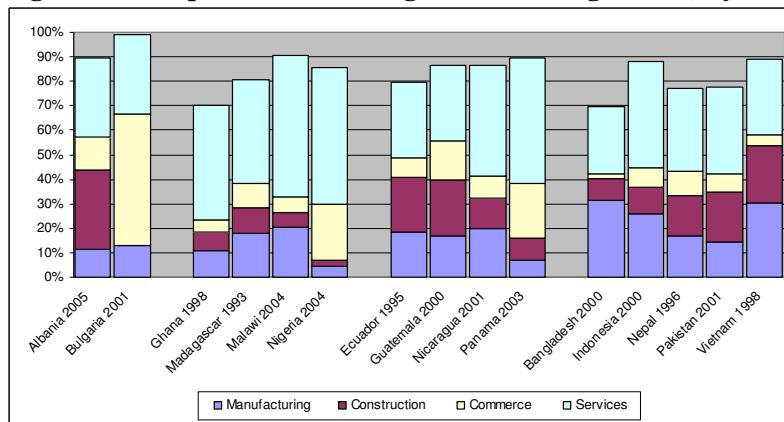
Figure 5. Composition of non-farm income, by sector



Note: Remainder of each column up to 100% is made up of other categories.

The relative importance of types of rural non-farm activities differs by whether a wage activity or self employment. As seen in Figure 6, services, primarily jobs in the public sector, are particularly important in non-agricultural wage employment, holding the greatest share of income in all countries except in Bulgaria. This is followed by manufacturing and then commerce. This latter category is much more important among non-agricultural self employment activities, in terms of both share of income and participation rates.

Figure 6. Composition of non-agricultural wage labor, by sector



Note: Remainder of each column up to 100% is made up of other categories.

Among the off-farm activities, transfers account for an important share of household incomes in many cases. With the exception of Nigeria, at least 20 percent of all rural households in countries surveyed received public or private transfers (see Figure 2). As can be seen in Figure 7, for most countries under study with the exception of the Eastern European countries, Guatemala and Bangladesh, rural households are more likely to receive private transfers than public transfers. Outside of Eastern Europe, only in Malawi and Guatemala do a large share

of rural households (>50 percent) receive public transfers,⁷ while for the rest of the countries the share is generally under 20 percent, and in some cases non-existent. In terms of share of income, from public and private transfers, Figure 8 indicates that private transfers generally dominate again with the exception of Eastern Europe and Guatemala.

Figure 7. Percent of rural households receiving public and private transfers

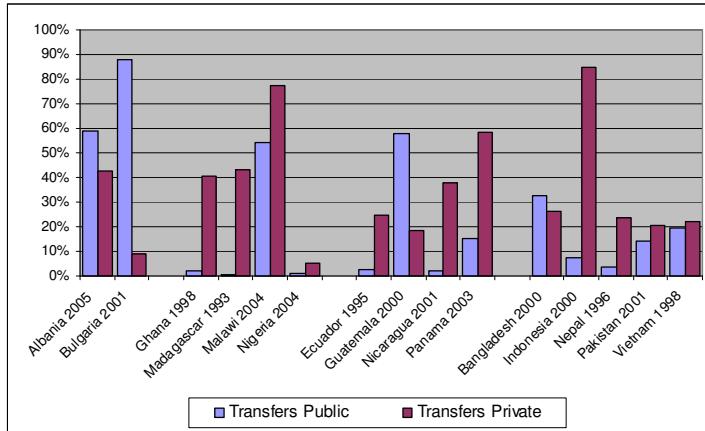
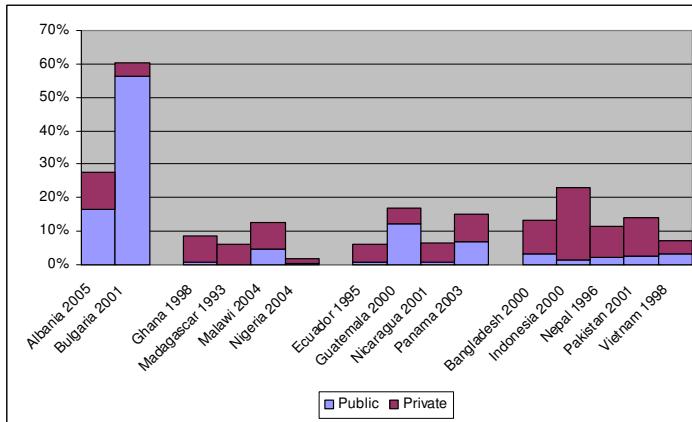


Figure 8. Percent of total income from transfers, by public and private



Rural income generating activities by level of expenditure

The previous section paints a picture of highly diversified rural economies in all countries considered, with the exception of those in Africa. Along with the heterogeneity in the types of rural income generating activities, there is likely to be significant variation in the returns to the different activities. For both agricultural and non-agricultural income generating activities, the literature indicates that there is on the one hand a high productivity/high income sub-sector, confined mostly among privileged, better-endowed groups in high potential areas. There are usually significant barriers to entry or accumulation to these high returns segments, in terms of land size and quality, human capital and other productive assets. Entry barriers to the more productive activities may prevent vulnerable groups from participating and seizing

⁷ The percentage in Malawi is driven by the Starter Pack, a nationwide program of distribution of agricultural inputs.

the opportunities offered by the more dynamic segments of the rural economy. The relevance of entry barriers may result from a combination of lack of household capacity to make investments in key assets and the relative scarcity of low capital entry economic activities in rural areas (Reardon et al, 2000).

On the other hand, there is usually a low productivity segment which serves as a source of residual income or subsistence food production; a “refuge” for the vast majority of the rural poor. This low productivity segment includes subsistence agriculture, seasonal agricultural wage labor and various forms of off farm self employment. Although very low, the resources generated through these often informal activities provide a “last resort” to ensure food security and complement an inadequate resource base, serving as an indispensable coping mechanism to reduce the severity of deprivation and avoid more irreversible processes of destitution to take place.⁸

These dual sectors often feed into each other. For those with few assets, seasonal and insufficient income from subsistence agriculture, or lack of access to liquidity/credit, poorly remunerated off farm activities may be the only available option. Households able to overcome financial or asset constraints may diversify or specialize in agricultural and non-agricultural activities, depending not only on access to specific assets but also household demographic characteristics and the functioning of local labor and credit markets. The observed dualism also often appears to be drawn along gender lines, with women more likely to participate in the least remunerated agricultural and non-agricultural activities.

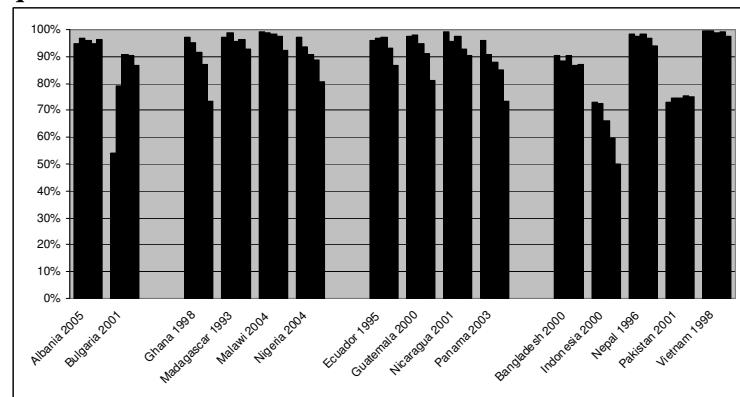
Given the existence of both low and high return rural income generating activities, with varying barriers to access, previous empirical studies—in most cases neither statistically representative nor comparable across countries—have shown a wide variety of results in terms of the relationship of rural income generating activities, and in particular RNF activities, to poverty. Studies reviewed in FAO (1998) found a higher share of RNF income among poorer rural households in Pakistan and Kenya and a higher share among richer households in Niger, Rwanda, Mozambique and Vietnam. More recently, Lanjouw (1999) and Elbers and Lanjouw (2001) for Ecuador, Adams (2001) for Jordan and Isgut (2004) for Honduras find that the poor have a lower share of income from RNF activities than the non-poor, while Adams (2002) finds the opposite for Egypt. De Janvry, Sadoulet and Zhu (2005) for China show that RNF reduces poverty, and particularly the severity of poverty, and that RNF activities have played a key role in falling poverty rates in China, as RNF activities provide an alternative to small landholdings. Conversely, Lanjouw and Shariff (2002) find that the importance of RNF activities by income level varies by state in their study of India. For those states with a high share of income from RNF activities, the shares are greater for better off households; for those states with a lower share of income from RNF activities, the opposite is true. This stems in part from the type of RNF activities associated with poverty status. The share of income from casual wage employment is highest among the poor, while the share from regular wage employment is highest among the rich.

To explore the relationship between rural income generating activities and poverty and identify activities generally associated with wealth, for each country we examine activities by expenditure quintile. The results, presented in the figures in this section, indicate a number of

⁸ See Lanjouw and Lanjouw (2001) and Lanjouw and Feder (2001) for a general discussion relevant to non-farm activities and Fafchamp and Shilpi (2003) for Nepal, Davis and Stampini (2002) for Nicaragua and Azzarri et al (2006) for Malawi, for example, regarding the role of agricultural wage labor.

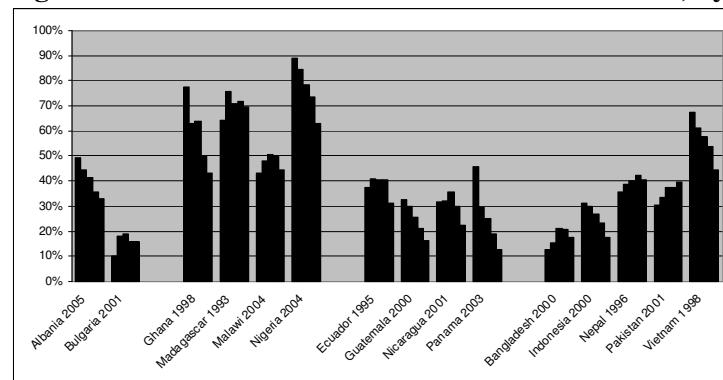
consistent trends across countries in terms of the variation of the importance of different sources of income by household wealth status.

Figure 9. Percent of households participating in on-farm activities, by expenditure quintile



Note: expenditure quintiles move from poorer to richer.

Figure 10. Percent of income from on-farm activities, by expenditure quintile



Figures 9 and 10 show, respectively, the participation rates and share of income from on-farm activities. The results indicate country specific relationships between on-farm activity and wealth. In only one country, Bulgaria, does participation in on-farm activities increase with wealth status. In half of the remaining countries participation rates are very high across all quintiles, and in the remaining seven countries there is greater participation among poorer households. On-farm income accounts for a large share of income of poorer quintiles in eight countries (Albania, Ghana, Nigeria, Guatemala, Nicaragua, Panama, Indonesia and Vietnam) is U-shaped for six countries, and only in Nepal and Pakistan does the share of farm income increase with wealth. The differences in results across countries suggest the relationship between agriculture and wealth depends largely on the type of agriculture and the overall social context, though it is difficult to associate country characteristics with these patterns, given the diversity of countries involved. A more detailed country-by-country account is needed to uncover the factors associated with differing household strategies.

Figure 11. Percent of rural households participating in agricultural wage labor, by expenditure quintile

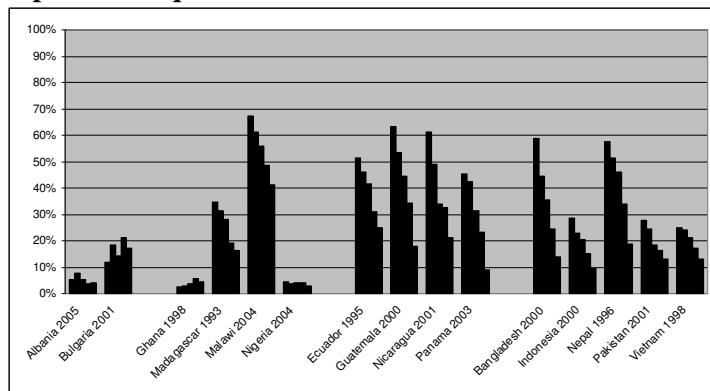
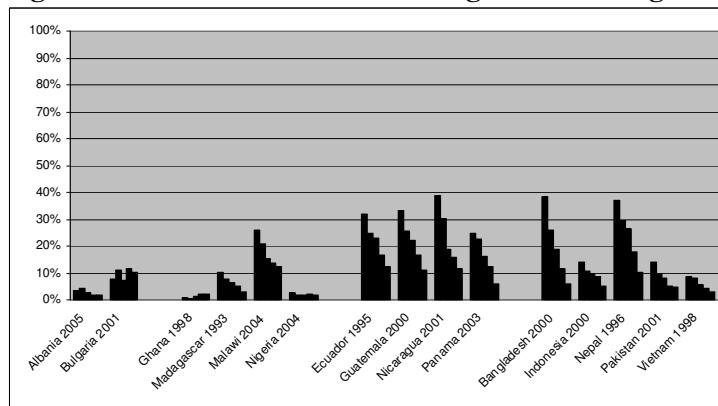


Figure 12. Percent of income from agricultural wage labor, by expenditure quintile



Unlike on-farm activities, agricultural wage labour activity shows a clearer association with wealth status (Figures 11 and 12) across countries. With the exception of four countries (Albania, Bulgaria, Ghana and Nigeria), which for the most part have negligible agricultural labour markets, poorer rural households are more likely to participate in agricultural wage employment. Similarly, the share of income from agricultural wage labor is more important for poorer households in these 11 countries including all of Latin America and Asia.

Figure 13. Percent of rural households participating in non-farm activities, by expenditure quintile

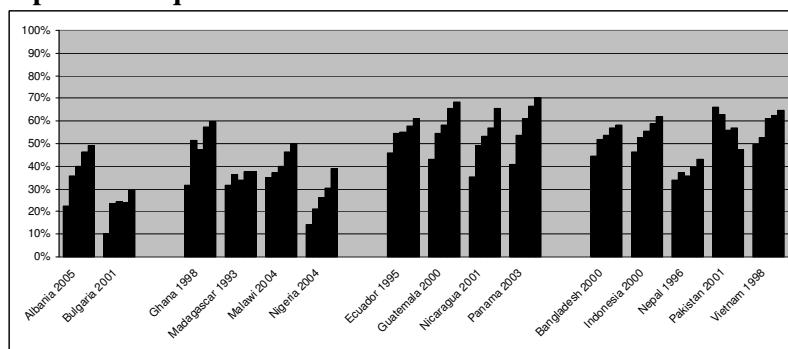
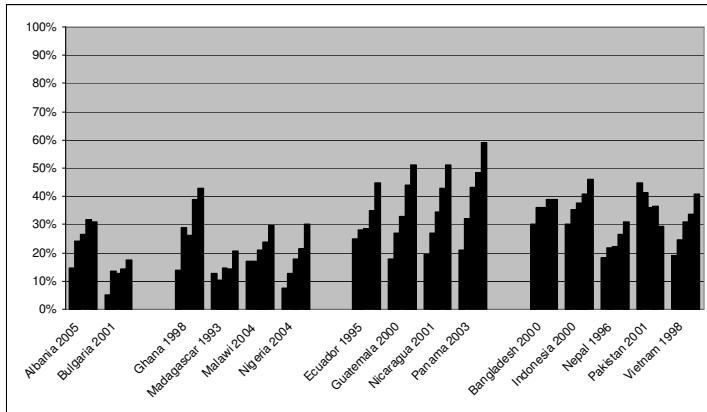


Figure 14. Percent of total income from non-farm activities, by expenditure quintile



In contrast to agricultural wage employment, greater participation in non-farm (wage and self employment) sources of income is associated with greater wealth, for all countries, with the exception of Pakistan (Figure 13). Wealthier households in rural areas have a higher share of income from non-farm activities, and again this is true for all countries, with the exception of Pakistan (Figure 14). Thus while a large percent of better off rural households maintain on-farm production, a key characteristic of these households is greater access to non-farm sources of income.

Finally, transfers to rural households tend not to be progressively distributed. Public transfers to rural households are disproportionately provided to households in poorer quintiles only in Albania, Malawi and Guatemala (Figure 15). In many countries, the relationship is nonlinear or even regressive. For some countries this likely reflects the fact that pensions, which are a key source of public transfers in developing countries, often go to wealthier households. This may also represent poor targeting of programs meant for the poor. Similarly, the percentage of rural households receiving private transfers tends to be regressively distributed (Figure 16). Only in one country, Madagascar, are the households in the poorest quintile most likely to receive private transfers while in almost all other countries households in the richest quintile are most likely to receive transfers.

Figure 15. Percent of rural households receiving public transfers, by expenditure quintile

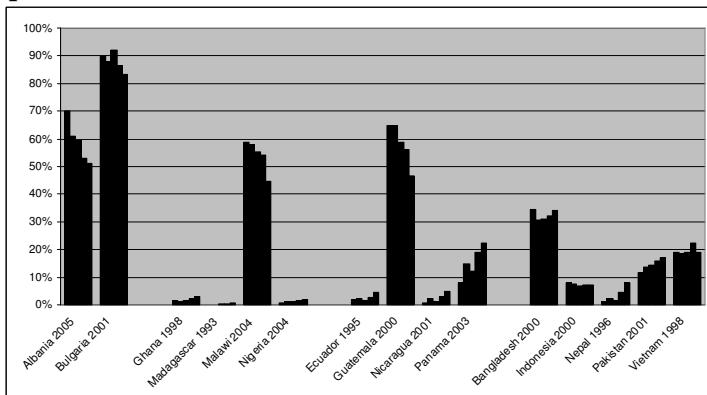
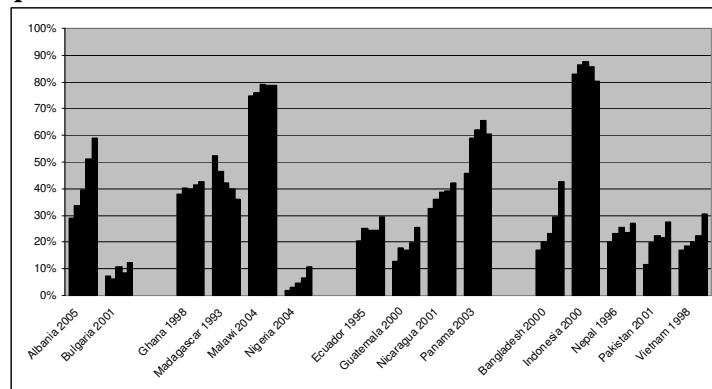


Figure 16. Percent of rural households receiving private transfers, by expenditure quintile



IV. Diversification and specialization of income sources among rural households

The results presented thus far show a highly diversified rural economy and suggest that rural households employ a wide range of activities. The question remains, however, over whether households tend to specialize in activities with diversity in activities across households or, alternatively, whether households themselves tend to diversify their activities thereby obtaining income from a range of activities. To answer this question, we need to establish what constitutes diversification or specialization. We therefore examine the degree of specialization and diversification by defining a household as specialized if it receives more than 75 percent of its income from a single source and diversified if no single source is greater than that amount. This will provide a sense of the degree of specialization and the activities through which households specialize. This typology of diversification and specialization encompasses the income generating activities presented earlier (with crop and livestock income joined together as farm income).

Figure 17. Percentage of rural households with diversified and specialized income generating activities



Note: Diversification is defined as earning no more than 75% of income from a single type of income generating activity. Income activities are defined as agriculture (crop and livestock), agricultural wage, rural non-farm wage, rural non-farm self employment, transfers and other.

The data presented in Figure 17 and Table 2 clearly show that household diversification, not specialization, is the norm. With the exception of a few African countries where it is still common to specialize in farm activities, the largest share of rural households is diversified, earning less than 75% of income from any one activity. In general, when households do specialize in most cases this specialization is in farm activities although in a few notable exceptions—Guatemala and Panama—the dominant form of specialization is in non-agricultural wage employment, while in Bulgaria transfers are dominant.

Table 2. Percent of rural households with diversified and specialized income generating activities.

	Principal Household Income Source (>=75%)						
	Diverse Income Portfolio	Ag Wage	Nonag wge	Self Emp	Transfers	Other	Farm
Albania 2005	55.9%	1.1%	9.6%	5.0%	8.8%	0.4%	19.3%
Bulgaria 2001	67.3%	2.2%	5.3%	0.9%	13.2%	0.1%	10.9%
Ghana 1998	24.0%	0.6%	6.2%	15.4%	3.4%	0.2%	50.1%
Madagascar 1993	30.6%	1.3%	2.8%	4.0%	1.4%	0.4%	59.4%
Malawi 2004	43.0%	7.1%	6.5%	6.7%	3.3%	0.1%	33.3%
Nigeria 2004	14.7%	1.0%	5.5%	7.8%	0.9%	0.2%	69.9%
Ecuador 1995	39.5%	13.1%	10.2%	8.8%	2.3%	0.6%	25.5%
Guatemala 2000	52.5%	10.8%	13.6%	6.1%	5.9%	0.2%	10.9%
Nicaragua 2001	41.7%	15.0%	15.5%	7.5%	0.9%	0.5%	18.9%
Panama 2003	42.6%	9.3%	19.9%	7.1%	6.6%	0.2%	14.3%
Bangladesh 2000	51.1%	5.3%	5.5%	6.9%	2.5%	2.9%	25.8%
Indonesia 2000	41.5%	5.9%	13.9%	10.4%	11.5%	1.1%	15.7%
Nepal 1996	40.8%	14.8%	7.8%	6.0%	5.1%	0.2%	25.2%
Pakistan 2001	22.6%	3.1%	20.1%	14.9%	1.3%	0.4%	37.5%
Vietnam 1998	43.7%	2.1%	1.8%	12.8%	1.2%	0.1%	38.3%

Outlined cells represented the greatest share of households for a given country dataset; shaded cells represent the highest among specializing households.

A rural household may have multiple activities for a variety of reasons: as a response to market failures, such as in credit markets, and thus earning cash to finance agricultural activities, or insurance markets, and thus spreading risks among different activities; failure of any one activity to provide enough income; or different skills and attributes of individual household members. Diversification into rural non-farm activities can reflect activities in either high or low return sectors, as described above. Rural non-farm activities may or may not be countercyclical with agriculture, both within and between years, and particularly if not highly-correlated with agriculture, they can serve as a consumption smoothing or risk insurance mechanism. Thus the results raise an interesting question regarding whether diversification is a strategy for households to manage risk and overcome market failures, or whether it represents specialization within the household in which some members participate in certain activities because they have a comparative advantage in those activities. If the latter is the case and it tends to be the young who are in off-farm activities, diversification may simply reflect a transition period as the household moves out of farm activities.

High levels of diversification at the household level, in any case, do not necessarily signify disengagement from agricultural activities. In all countries except for three in Africa, diversified households account for a least thirty percent of the total value of both marketed and overall agricultural production, as can be seen in Table 3. In six countries, diversified households account for a greater share of the total value of both marketed and overall agricultural production then farm specializing households, and in three of these countries (Bangladesh, Albania and Guatemala) diversified households account for approximately 60 percent of the total value.

Table 3. Value of marketed and total agricultural production, by diversification typology

	Percentage of total value of marketed agricultural production						Percentage of total value of agricultural production					
	Diversified	Farm	Agr Wage	Non-Agr Wage	Self Emp	Transfers & Other	Diversified	Farm	Agr Wage	Non-Agr Wage	Self Emp	Transfers & Other
Africa												
Ghana 1998	21.8	70.8	0.1	1.3	5.7	0.4	22.3	71.2	0.1	1.0	5.2	0.2
Madagascar 1993	21.7	75.3	0.3	0.4	2.1	0.3	17.8	71.3	0.2	0.3	10.3	0.2
Malawi 2004	29.2	67.1	0.6	1.5	1.4	0.2	33.8	59.2	1.6	3.3	1.8	0.3
Nigeria 2004	9.5	86.8	0.6	1.1	1.9	0.1	9.0	88.3	0.5	0.8	1.4	0.1
Asia												
Bangladesh 2000	60.5	18.8	3.2	4.8	5.4	7.3	60.4	16.7	3.6	5.0	5.8	8.5
Indonesia 2000	48.8	41.2	0.6	3.7	3.2	2.5	48.8	41.2	0.6	3.7	3.2	2.5
Nepal 1996	44.0	47.2	2.0	2.8	2.3	1.7	45.4	43.6	2.7	3.5	2.4	2.4
Pakistan 2001	28.4	69.6	0.2	0.7	0.5	0.7	31.0	65.1	0.5	1.2	0.8	1.5
Vietnam 1998	39.0	49.1	0.7	1.0	10.0	0.2	39.9	48.5	0.7	0.9	9.7	0.2
Eastern Europe												
Albania 2005	59.6	31.8	0.8	3.0	2.2	2.6	60.9	28.2	0.8	3.8	3.0	3.2
Bulgaria 2001	32.0	4.0	0.3	4.2	0.0	59.5	40.1	5.2	0.9	3.9	0.1	49.9
Latin America												
Ecuador 1995	42.5	46.3	3.3	3.3	3.1	1.4	44.1	43.7	3.7	3.5	3.8	1.2
Guatemala 2000	59.2	30.3	2.1	2.0	4.5	1.8	61.2	25.9	3.1	2.8	5.4	1.7
Nicaragua 2001	31.9	54.0	4.5	3.7	4.2	1.7	33.9	50.9	4.8	3.6	4.9	1.9
Panama 2003	44.3	34.4	1.8	7.9	9.4	2.2	48.7	31.3	3.4	7.8	6.7	2.3

The empirical relationship between diversification and wealth is thus not straightforward. A reduction in diversification as household wealth increases could be a sign that those at lower income levels are using diversification to overcome market imperfections. Alternatively, a reduction in diversification as household wealth decreases could be a sign of inability to overcome barriers to entry in a second activity thus indicating that poorer households are limited from further specialization. Alternatively, an increase in diversification as household wealth increases could be a sign of using profitability in one activity to overcome threshold barriers to entry in another activity, or complementary use of assets between activities.

Figure 18. Percent of rural households with diversified income portfolio, by expenditure quintile

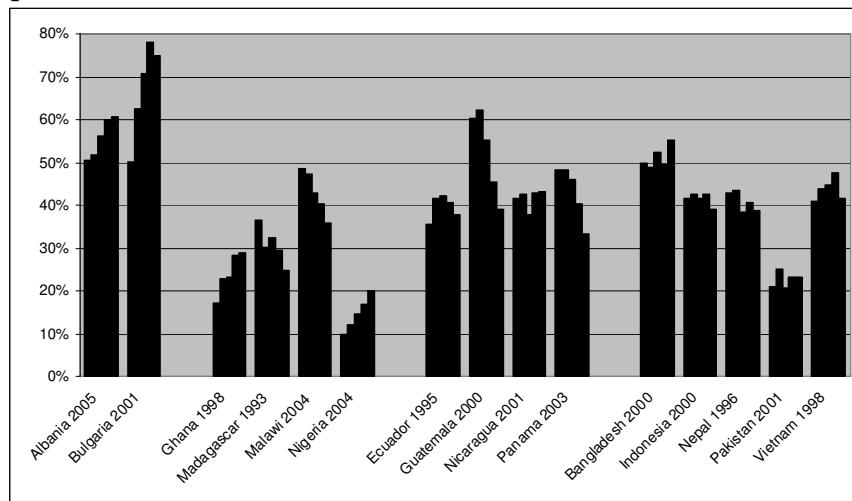


Figure 18 explores the relationship between diversification and expenditure—the proxy used for wealth—while Figures 19-22 examine specialization by activity across expenditure quintile. Diversification of income generating strategies varies little by wealth status in the RIGA countries. In only a few cases (4 of 15), the share of households with diversified sources of income increases with wealth, and in another four countries, diversification decreases with wealth. For the rest, there is not pattern across quintiles.

Figure 19. Percent of rural households specializing in on-farm activities, by expenditure quintile

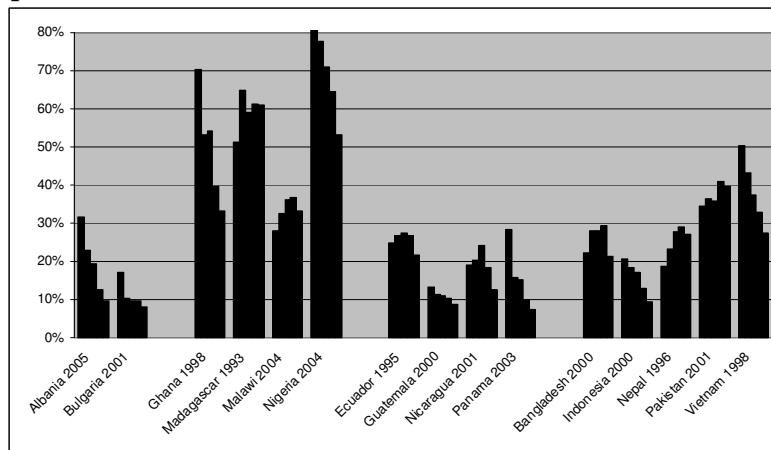
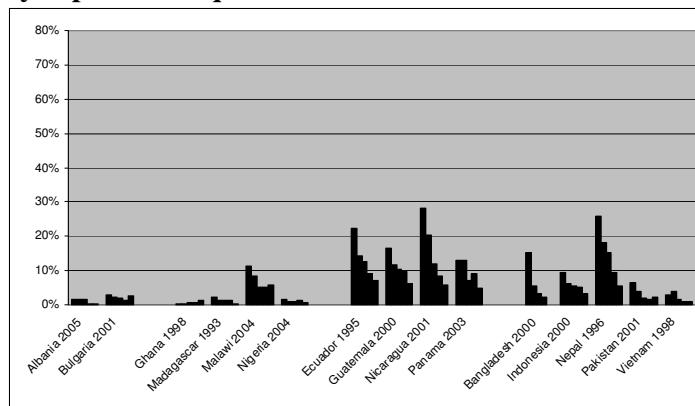


Figure 20. Percent of rural households specializing in agricultural wage labor activities, by expenditure quintile



The extent of specialization in one income generating activity varies by country and wealth status. The most common specialization is in on-farm activities (crop and livestock), although this varies across countries and by wealth status within countries (Figure 19) and it is difficult to find any particular pattern. For over half of the countries (8 of 15), the share of households specializing in on-farm activities decreases with wealth, while for only two countries (Nepal and Pakistan), does the share increase. In countries in which a significant share of the population specializes in agricultural wage labor activities (mostly those in Latin America and Asia), the poorest households tend to specialize in this activity (Figure 20). Conversely, where there is specialization in RNF employment, whether non-agricultural wage or non-agricultural self employment (Figures 21-22), it tends to be those in the higher wealth categories, with the clear exception of Pakistan for non-agricultural self employment. The results confirm the earlier conclusions in that, with few exceptions, agricultural wage employment is associated with poverty and rural non-agricultural activities with wealth.

Figure 21. Percent of rural households specializing in non-agricultural wage activities, by expenditure quintile

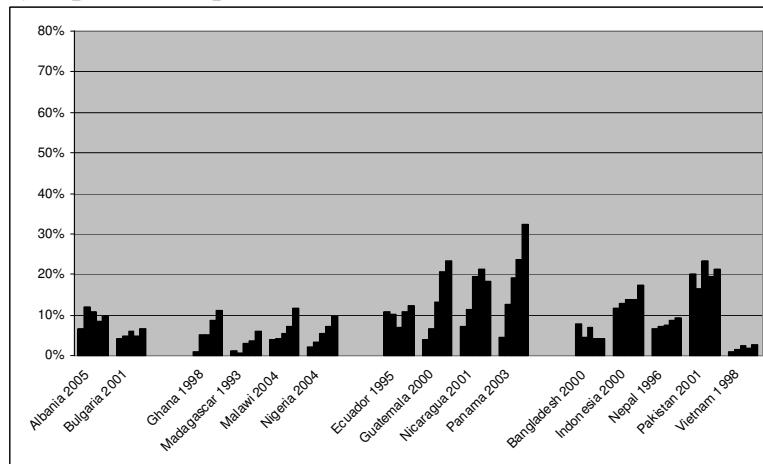
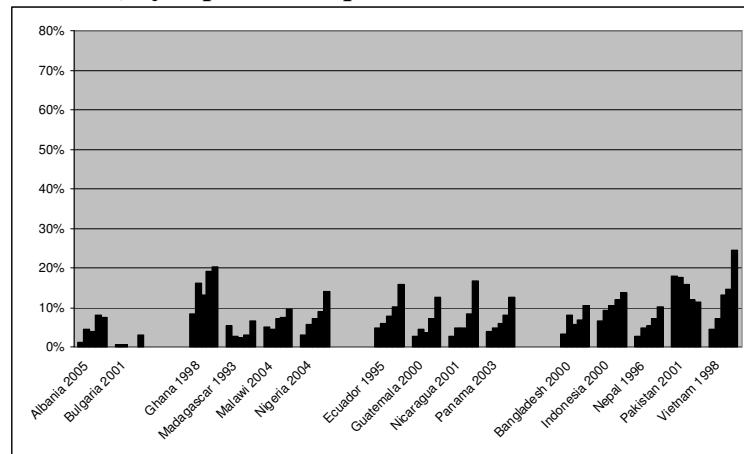


Figure 22. Percent of rural households specializing in non-agricultural self employment activities, by expenditure quintile



V. Decomposition of inequality by income source

One concern with the increasing importance of rural non-farm activities is the exacerbation of income inequality in the rural space. Income inequality, which has been on the rise in many parts of the developing world, has come under increased scrutiny as a potential brake on economic growth. While most of this literature has looked at economy wide effects, one source of this income inequality may stem from changes in the rural economy. Given the often higher returns in the rural non-farm economy, and the key role of access to specific private and public assets, in particular education, the hypothesis is that rural non-farm activities are likely to be inequality increasing. However, the answer may depend on where a particular country or region is located in the development process, and at which point in the stages of growth of rural non-farm economy. Further, the answer may also depend on the relative access to different assets, for example Adams' (2001) comment that in land rich and labor-poor situations (such as parts of Africa), agricultural income is inequality reducing and rural non-farm income inequality increasing, while in land poor and labor rich situations (for example parts of Latin America or Asia), agricultural income is inequality increasing and rural non-farm income inequality decreasing,

Few consistent patterns, however, have emerged in the literature regarding the impact of RNF activities on inequality. Reflecting conventional wisdom, studies by Elbers and Lanjouw (2001) in Ecuador, Adams (2001) in Jordon, Burgess (1997) in China, Reardon and Taylor (1996) in Burkina Faso and Collier et al (1986) in Tanzania indicate that RNF income may be, in fact, inequality increasing. While participation in rural non-farm activities may improve rural income as a whole, there are barriers to this participation associated with access to certain assets—particularly education—thus leading to increased income disparities, particularly in poorer areas.

Conversely, Adams (1995) in Pakistan, Lanjouw (1999) in Ecuador, Adams (2002) in Egypt, Chinn (1979) in Taiwan and de Janvry, et al (2005) in China find that nonfarm income is associated with a reduction in overall rural income inequality in those countries. This is often attributed to the lack of access of poorest households to the key productive asset in rural areas—land. De Janvry, et al (2005), in a study on China, show that participation in non-farm

activities was associated with greater improvement in the income of the poorest households, while the most proficient farmers remained in agriculture.

Some of these differences in outcomes may be due to differences in types of household data, as well as definitions of what consists of rural non-farm activities. Further, due to the time dimension, the relationship between inequality and RNF activities may be U-shaped; that is, at initial stages of development RNF activities are inequality increasing but as the sector develops and expands RNF activities are inequality decreasing.

Description of decomposition of Theil index

The objective of this section is thus to determine if growth in rural non-farm activities leading to increased inequality, or more broadly, ascertain the role of each type of rural income generating activity in reducing or increase household income inequality. We chose the Theil index over its better known competitor, the Gini index, because we felt that the Theil index provides a cleaner and more intuitive decomposition of income inequality by income source. We estimate the Theil T inequality index for total income and the components of total income following the approach described by Morduch and Sicular (1998). This measure gives a measure of inequality that accounts for the population share of each individual as well as the share of income in total income for the individual level of observation. The following equation describes how the Theil for each income component is obtained, where $1/n$ represents the population share of each observation, y_i^k is the individual-level income from component k , μ_y is the mean total per capita income (such that y_k/μ_y is the proportion of individual-level income from component k to total average income), and y_i is total per capita income:

$$T(Y^k) = \sum_{i=1}^n \left\{ \left(\frac{1}{n} \right) * \left(\frac{y_i^k}{\mu_y} \right) * \ln \left(\frac{y_i^k}{\mu_y} \right) \right\}$$

The sum of the component Theils ($T(Y^k), k = 1 \dots K$) is then equal to the overall Theil T index, $T(Y)$, illustrated by the following equation:

$$T(Y) = \sum_{i=1}^n \left\{ \left(\frac{1}{n} \right) * \left(\frac{y_i}{\mu_y} \right) * \ln \left(\frac{y_i}{\mu_y} \right) \right\}$$

A Theil index of zero indicates equality since it implies that the share of income held by each individual is equal to the individual's population share (such that y_i/μ_y equals 1 and its logarithm equals zero). The larger the value of the Theil index, the greater the inequality, such that the value of the overall index is restricted to the range $[0, \ln(n)]$ where n is the sample size. When the Theil is decomposed into its components, the index is subject only to an upper bound such that: $T(Y^k) \leq \ln(n)$. A negative index, $T^k \leq 0$, would then indicate an inequality reducing effect for component k , whereas a positive index, $0 \leq T(Y^k) \leq \ln(n)$, indicates an inequality increasing effect, with the effect growing as $T(Y^k)$ approaches $\ln(n)$. Equality is still represented by $T(Y^k) = 0$.

Results

In contrast with the diversity of results presented above, non-farm sources of income are associated with increasing income inequality. In almost all countries under study non-agricultural wage and self employment income are inequality increasing, and in fact in terms of magnitudes, self employment, followed by wage employment, are responsible for the largest share of income inequality in most countries (Table 13). Where rural non-farm activities are not responsible for largest share, most notably in Pakistan and Malawi, crop incomes drive the results, and in Nigeria and Bulgaria agricultural wage income is deriving inequality. Even in these last two countries, non-agricultural wage income still accounts for a large share of income inequality. Besides Malawi already mentioned, in the other three African countries crop incomes account for a relatively large share of income inequality. Otherwise, for most countries, sources other then non-agricultural wage and self employment are more or less neutral in terms of income inequality.

Table 13. Percent contribution of income sources to total inequality, Theil index (positive reflects inequality increasing; negative reflects inequality decreasing).

	Crop2	Livestock	Ag Wage	Non-Ag Wage	Self Emp	Transfers	Public Transfers	Private Transfers	Other	Total
Albania 2005	-5.4%	-11.7%	4.1%	28.2%	<u>82.5%</u>	1.0%	-5.5%	6.4%	1.2%	100.0%
Bulgaria 2001	6.7%	11.0%	<u>29.7%</u>	28.0%	7.2%	<u>16.7%</u>	<u>12.6%</u>	4.1%	0.8%	100.0%
Ghana 1998	<u>18.4%</u>	1.1%	1.6%	<u>15.4%</u>	<u>61.2%</u>	2.3%	0.1%	2.2%	0.0%	100.0%
Madagascar 1993	32.3%	<u>12.1%</u>	0.7%	-0.5%	<u>52.2%</u>	1.1%	0.2%	0.9%	2.0%	100.0%
Malawi 2004	<u>93.1%</u>	-0.3%	-1.9%	8.6%	2.4%	-1.8%	-0.8%	-1.0%	0.0%	100.0%
Nigeria 2004	13.0%	0.6%	<u>41.9%</u>	35.2%	8.9%	0.2%	0.1%	0.0%	0.2%	100.0%
Ecuador 1995	2.6%	1.1%	8.4%	24.0%	<u>55.9%</u>	2.8%	0.6%	2.2%	5.2%	100.0%
Guatemala 2000	-5.5%	0.9%	3.5%	<u>55.6%</u>	37.6%	4.6%	-2.3%	6.9%	3.2%	100.0%
Nicaragua 2001	-4.3%	1.0%	7.6%	42.6%	<u>42.7%</u>	4.2%	0.8%	3.3%	6.3%	100.0%
Panama 2003	-6.4%	0.1%	6.0%	<u>67.0%</u>	24.9%	6.5%	7.0%	-0.5%	1.9%	100.0%
Bangladesh 2000	-0.2%	0.2%	-9.3%	17.0%	<u>55.5%</u>	31.9%	2.4%	<u>29.5%</u>	5.0%	100.0%
Indonesia 2000	0.7%	1.8%	6.6%	<u>53.0%</u>	32.4%	3.3%	1.4%	1.9%	2.3%	100.0%
Nepal 1996	2.3%	<u>12.2%</u>	-2.0%	27.1%	<u>44.3%</u>	<u>13.3%</u>	3.4%	<u>10.0%</u>	2.8%	100.0%
Pakistan 2001	<u>57.1%</u>	1.5%	-2.9%	4.0%	24.6%	2.2%	0.0%	2.2%	13.5%	100.0%
Vietnam 1998	-7.5%	-4.0%	-2.0%	1.5%	<u>111.9%</u>	0.0%	-0.3%	0.2%	0.2%	100.0%

Positive percent contribution greater than 10 percent is shaded in yellow; negative in blue; highest contributor is underlined.

VI. Conclusion

The analysis of the income generating activities of rural households from the RIGA cross country dataset paints a clear picture of multiple activities across rural space and diversification across rural households. This is true across countries in all four continents, though less so in the African countries included in the dataset. For most countries the largest share of income stems from off farm activities, and the largest share of households have diversified sources of income. Diversification, not specialization, is the norm, although most countries show significant levels of household specialization in non-agricultural activities as well. Nevertheless, agricultural based sources of income remain critically important for rural livelihoods in all countries, both in terms of the overall share of agriculture in rural incomes as well as the large share of households that still specialize in agricultural sources of income.

From where does this diversification derive? Diversification may function as a strategy for households to manage risk and overcome market failures, or represent specialization within the household deriving from individual attributes and comparative advantage. If the latter is the case and it tends to be the young who are in off-farm activities, diversification may simply reflect a transition period as the household moves out of farm activities. Diversification into

rural non-farm activities can thus be into either high or low return sectors, reflect push or pull forces, and represent a pathway out of poverty or a survival strategy.

While the nature of the diversification response will vary by a given household, in each country, overall greater reliance on non-farm sources of income is associated with greater wealth. In almost all cases, wealthier households in rural areas have a higher level of participation in, and greater share of income from, non-farm activities, while both public and private transfers tend to be regressively, or neutrally, distributed. Similarly, wealthier households have a larger share of specialization into non agricultural wage and self employment activities.

Conversely, agricultural based sources of income are generally most important for the poorest households. Income from crop and livestock activities, as well as from agricultural wage labor, represents a higher share of total income for poorer households in almost all countries. Furthermore, a higher share of households specializing in on-farm activities or agricultural wage employment is found at the low end of the wealth distribution.

As would stand to follow from these trends, non-farm sources of income are associated with increasing income inequality. In almost all countries under study, non-agricultural wage and self employment income are inequality increasing, and in fact in terms of magnitudes, self employment, followed by wage employment, account for the largest share of income inequality in most countries.

These results are not uniform among all countries and Pakistan, for example, is the one country which bucks most of these trends. Greater share of agricultural sources of income, and greater specialization in agricultural activities, are associated with wealth, while the opposite is true for non-farm employment. Similarly, crop income is inequality increasing in Pakistan. These trends may be due to the particularly strong unequal land access in Pakistan, and in particular the large number of landless among the poor, with the landless forced to low return wage employment, both agricultural and non-agricultural.

Multivariate analysis of the data (presented in Davis, et al, 2007) suggests that overall, the characteristics of households participating in different income generating activities are surprisingly similar across very different countries. Households participating in on-farm activities are landed, with lower levels of education, located at greater distances from infrastructure, with an older, male headed household. Conversely, households involved with non-agricultural wage labor have, overall, higher levels of education, but also are located closer to infrastructure, with a younger head of household and a larger family. Households participating in agricultural wage labor have little land or education, are isolated from infrastructure, and have a younger, and primarily male, head of household. Finally, households relying more on transfers are more likely to have older and female heads of household.

The linking of assets with specific income generating activities is an indication of increasing specialization of households in a given income generating activity over time, and as they seek to leave poverty, in most countries as part of a general transition away from agriculture. One key lesson from this analysis is the need to reduce constraints to participation in the non-farm sector, both in terms of increasing demand through provision of education and other measures to enhance human capital, as well as through increasing supply of labor opportunities, locally, or elsewhere, through migration. A second lesson is the continued importance of agricultural

sources of income, particularly for poorer households. This idea, combined with recognition that a large share of rural non-farm opportunities are often directly or indirectly generated by agriculture, requires renewed emphasis on this sector.

For policy makers, the results offered here suggest the need to carefully consider how to promote rural development. While the diversification of rural households clearly indicates the need to look beyond agriculture in rural development policies, the overall importance of agriculture, particularly for poorer households, suggests that the promotion of rural non-farm activities ought to constitute a key component of any strategy. Policy makers must also be careful that any intervention deal with the likelihood that barriers to entry may limit the ability of poor households to take advantage of opportunities, particularly the most remunerative, and thus exacerbate inequalities. The links between certain assets and activities imply that due consideration be given to those assets, or combination of assets, which will ensure broad growth in the rural economy. This complexity means that a particular policy is unlikely to fit different situations across countries and even within regions in a given country and that location specific policies are necessary. This ultimately calls for an institutional structure that allows for the diversity of policy measures to match closely the diversity of the rural economy.

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