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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 (the RIGA dataset) composed of comparable income aggregates and other variables from 28 nationally representative household surveys of developing and transition countries 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.

Rural Income Generating Activities: A Cross Country Comparison

1. Introduction

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 to the existence of a large RNF economy.¹ 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.²

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 households. 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,

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 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 households behind and exacerbate rural income inequality.

The general objective of this 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, a number of limitations suggest the need for further work. First, most of the previous literature has focused on 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 as well 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, such as the World Bank poverty assessments, 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 given country.

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.

The paper continues as follows. In Section II, we present and describe the construction of the RIGA database. In Section III, we analyze the participation of rural households in 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 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, followed by conclusions in Section VI.

2. Description of the RIGA database

The RIGA database 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 the Food and Agriculture Organization of the United Nations (FAO).³ From this pool of possible surveys, the choice of particular countries was guided by the desire to ensure geographic coverage across the four principal developing regions – Asia, Africa, Eastern Europe and Latin America – as well as adequate quality and sufficient comparability in codification and nomenclatures. Furthermore, an effort was made to include a number of IDA (International Development Association) countries as these represent developing countries with higher levels of poverty and are therefore of particular interest to the development and poverty reduction debate. 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 paper. 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 here]

The construction of income aggregates that are comparable across countries was the principal output of the RIGA database,⁴ an endeavor that required resolving a host of issues in order to establish a consistent methodology. 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 they reflect local information about what constitutes rural and are the definitions 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 definition⁵ and therefore the government definition of what constitutes rurality is used. One additional caveat regarding rurality is that with the information available we identify rurality via the domicile of the household, and not the location of the job. It is probable that a number of rural labour activities identified in this report are located in nearby urban areas.⁶

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 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: 1) crop production; 2) livestock production; 3) agricultural wage employment, 4) non-agricultural wage employment; 5) non-agricultural self employment; 6) transfer; and 7) other. 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 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* (crop, livestock and agricultural wage income) and *non-agricultural* activities (non-agricultural wage, non-agricultural self employment, transfer and other income). In a second grouping, we refer to crop and livestock income as *on-farm* activities, 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.

A third choice relates to whether, in the analysis, income shares should be analyzed as the mean of income shares or as the share of mean income. In the first case, income shares are calculated for each household, and then the mean of the household shares of each type of income (MS_i) is calculated, as shown below, with income source i , total income Y , household h , and n the number of households. In the second case (SH_i), income shares are calculated as the share of a given source of income over a given group of households:

$$SH_i = \frac{\sum_{h=1}^n y_{ih}}{\sum_{h=1}^n Y_h} \qquad MS_i = \frac{\sum_{h=1}^n y_{ih} / Y_h}{n}$$

The two measures have different meanings. The *mean of shares* reflects more accurately the household-level diversification strategy, regardless of the magnitude of

income; while the *share of means* reflects the importance of a given income source in the aggregate income of rural households in general or for any given group of households. If the distribution of the shares of a given source of income is constant over the income distribution, the two measures give similar results. If however, for example, those households with the highest share of crop income are also the households with the highest quantity of crop income, then the share of agricultural income in total income (over a given group of households) using the share of means will be greater than the value using mean of shares. Given our emphasis on the household as the basic unit of analysis, we use the mean of shares throughout this paper.

Note that the difference in the manner in which shares are described and in which rural income generating capacities in general are discussed has led to some confusion over the terminology used in the literature. In particular, the term diversification is often used to describe the rural economy as a whole when there is a clear range of activities from which rural households obtain income. But a diversified rural economy does not necessarily imply diversified households – that is, households that participate in and obtain income from a range of economic activities. It may be the case that households tend to specialize in certain activities although the rural economy as a whole is economically diverse. To avoid this confusion, we use the terms rural diversification to suggest diversification of the overall rural economy and household diversification to refer to household behavior.

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.⁷ The final set of data used for this analysis includes 15 nationally representative, comparable datasets with a consistent set of variables.⁸

3. Rural diversification of income sources

Much of the literature on rural non-farm activities focuses on the diversification of income sources over rural space, or over groups of households within the rural space. To examine this rural diversification, we begin by looking at the share of income from, and household participation in, rural income generating activities. Off-farm sources of income account for 50 percent of total income in two-thirds of the countries of the dataset (Table 2). This is true of all of the countries from Eastern Europe and Latin America and for all but Vietnam in Asia. On-farm sources of income tend to be more important for the African countries, where the share ranges from 55 to 77 percent of total income. Joining together income from agricultural wage labour with crop and livestock production, about half (8 of 15) of the RIGA countries had a majority of income from agricultural sources. Overall, as would be expected, the share of rural non farm income falls, and the share of rural non agricultural income increases, with increasing levels of GDP per capita (Figure 1).

[Table 2 here]

[Figure 1 here]

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 Table 3 which shows participation rates in different income generating activities. In all countries but one (Indonesia), about two thirds or more of rural households participate in on-farm activities and in 11 countries the percentage is above 80 percent.⁹ 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 and specialization—agriculture continues to play a fundamental role in rural household economic portfolios across countries. For non-farm activities and transfers, the range of participation ratios across countries is much greater, though in both cases for most countries the rate is at least 30 percent. In contrast, relatively few rural households in the Eastern European countries work in agricultural wage labour, while 20 to 40 percent do so in the Latin American and Asian countries. Variation is greatest in Africa where few households work in agricultural wage in Ghana and Nigeria while over 50 percent work in agricultural wage labor in Malawi and over 20 percent do so in Madagascar. 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 III.

[Table 3 here]

Disaggregation of rural income generating activities

Participation rates in non-farm activities are further disaggregated into non-agricultural wage employment and self employment in Table 3. While the rates of self employment participation are lowest for the countries in the Eastern European 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.

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. We identify nine sectors in wage employment—mining, manufacturing, utilities, construction, commerce, transport, finance, services and other—and ten 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 2 shows the share of non-farm income in the four most common sectors. 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 the Latin American countries, while commerce is more important in the Eastern European countries.

[Figure 2 here]

The relative importance of types of rural non-farm activities differs by whether they are wage activity or self employment activities. As seen in the same figure, services, primarily jobs in the public sector, are particularly important in non-agricultural wage employment, holding the greatest share of income in almost all countries. 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 shares of income and participation rates (latter not shown).

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 often, 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 return 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 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.¹⁰

These dual sectors often feed into each other. For those with few assets, seasonal and insufficient income from subsistence agriculture, and/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) show 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 across countries between rural income generating activities and poverty and to 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 consistent trends across countries in terms of the variation of the importance for some, but not all, of the sources of income, by household wealth status. Figure

3 details participation in the four main income categories by expenditure quintile, and Figure 4 the respective shares of total income.

[Figure 3 here]

Using these simple descriptive statistics, we find a number of clear patterns across expenditure quintiles. First, focusing on on-farm activities, we find that participation in on-farm activities is relevant for a majority of households across the expenditure spectrum. At least 50 percent of households in all expenditure categories had on-farm activities. For most countries, participation in, and share of income from, on-farm activities is either greater for poorer households or there is an inverted-U trend across quintiles. Only in Pakistan does the share of on-farm income unambiguously increase across quintiles.

[Figure 4 here]

Participation in, and shares of income from, agricultural wage labour show a clear negative correlation with level of expenditure 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 have a much higher rate of participation in agricultural wage employment. Similarly, the share of income from agricultural wage labor is more important for poorer households in these same 11 countries including all of the Latin American and Asian countries.

In contrast to agricultural wage employment, greater participation in non-farm (wage and self employment) sources of income is associated with greater level of household expenditures, for all countries, with the exception of Pakistan and Nepal. 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. 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.

[Figure 5 here]

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 5). 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. 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.

4. Diversification and specialization 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 at the level of the household. 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 on-farm income).

Household diversification, not specialization, is the norm, as can be seen in the data presented in Table 4. Not only are most rural economies highly diversified, but rural households are as well. With the exception of the African countries where it is still common to specialize in on-farm activities, the largest share of rural households is diversified. In general, when households do specialize, in most cases this specialization is in on-farm activities although in a few notable exceptions—Guatemala, Panama and Bangladesh—the dominant form of specialization is in non-agricultural wage employment, while in Bulgaria transfers are dominant.

[Table 4 here]

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.

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 6 here]

This inability to conceptually sign a priori the correlation between diversification and household wealth status emerges from the data. Figure 6 explores the relationship between diversification and expenditure—the proxy used for wealth—while we examine specialization by activity across expenditure quintile further ahead. 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 no pattern across quintiles. Ranked by per capita GDP (Figure 7), the share of diversified rural households is an inverted U, which is consistent with the hypothesis of higher levels of on farm specialization in the early stages, increasing diversification with growth in GDP, and eventual specialization in non farm activities. This is confirmed in the same figure, as the share of on-farm specializing households drops as per capita GDP increases.

[Figure 7 here]

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 Figure 8. In eight countries diversified

households account for a greater share of the total value of agricultural production than on-farm specializing households, and in five of these countries (Albania, Bangladesh, Bulgaria, Ecuador and Guatemala) diversified households account for at least 60 percent of the total value.

[Figure 8 here]

The most common specialization is in on-farm activities; however, as in the case with the share of farm income in the rural space, for nearly half of the countries (7 of 15), the share of households specializing in on-farm activities clearly decreases with wealth, while for only two countries (Nepal and Pakistan), does the share increase, reaching close to 30 percent of households in the top expenditure quintile. Nevertheless, for all the African countries, at least 30 percent of the top quintile are on-farm specialists, reaching 50 to 60 percent in Nigeria and Madagascar, respectively. Given the ranges between the poorest and richest diversifying households and on-farm specialists, however, the type of activity trumps differentiation by wealth; that is, most rural households in our Latin American and Eastern European countries, rich or poor, are diversified, while most rural households in the African countries (with the exception of Malawi), rich or poor, are on-farm specialists.

[Figure 9 here]

Specialization in off-farm activities show a more consistent correlation with household level of expenditure across countries. For those countries in which a significant share of the rural population specializes in agricultural wage labor activities (mostly those in Latin America and Asia), the poorest households tend to specialize in this activity (Figure 9). Conversely, where there is specialization in RNF employment, whether non-agricultural wage or non-agricultural self employment, it tends to be among those in the higher wealth categories, with the clear exception of Pakistan for non-agricultural wage and self employment. The results confirm the earlier conclusions in that, with few exceptions,

specialization in agricultural wage employment is associated with poverty and rural non-agricultural activities with wealth.

5. Decomposition of inequality by income source

One concern with the increasing importance of rural non-farm activities and the correlation with greater wealth 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 Jordan, 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, as discussed earlier 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, Sadoulet and Zhu (2005) in China find that nonfarm income is associated with a reduction in overall rural income inequality in those countries. This result is often attributed to the lack of access of the poorest households to the key productive asset in rural areas—land. De Janvry, Sadoulet and Zhu (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.

The objective of this section is thus to determine if growth in rural non-farm activities leads to increased inequality, or more broadly, to ascertain the role of each type of rural income generating activity in reducing or increasing 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 index 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:

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

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 one 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, $T^k \leq 0$, indicates 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 $T(Y^k) = 0$.

We find that in contrast with the diversity of results presented above, non-farm sources of income are consistently associated with increasing income inequality. In two-thirds of the 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 5). Where rural non-farm activities are not responsible for the largest share, most notably in Ecuador, 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 than non-agricultural wage and self employment are more or less neutral in terms of income inequality.

[Table 5 here]

6. 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. Given the careful construction of comparable cross country income variables with the RIGA dataset, we can be reasonably certain that the diversity of results is real and not a function of different methods or data. For most countries the largest share of income stems from off farm activities, and the largest share of households have diversified sources of income. This diversification may function as a household strategy to manage risk and overcome market failures, or represent specialization within the household deriving from individual attributes and comparative advantage. Therefore diversification can be into either high or low return sectors, reflect push or pull forces, and represent a pathway out of poverty or a survival strategy.

The results reveal 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 and on-farm sources of income.

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, and particularly 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 depend on low return wage employment, both agricultural and non-agricultural.

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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Table 1. Countries included in the analysis

Country	Name of Survey	Year Collected	Number of Observations		
			Total	Rural	Urban
Eastern Europe					
Albania	Living Standards Measurement Study Survey	2005	3,640	1,640	2,000
Bulgaria	Integrated Household Survey	2001	2,633	877	1,756
Africa					
Ghana	Ghana Living Standards Survey Round 3	1998	5,998	3,799	2,199
Madagascar	Enquête Permanente Auprès des Ménages	1993-1994	4,505	2,653	1,852
Malawi	Integrated Household Survey-2	2004-2005	11,280	9,840	1,440
Nigeria	Living Standards Survey	2004	17,425	13,634	3,791
Latin America					
Guatemala	Encuesta de Condiciones de Vida	2000	7,276	3,852	3,424
Ecuador	Estudio de Condiciones de Vida	1995	5,810	2,532	3,278
Nicaragua	Encuesta de Medición de Niveles de Vida	2001	4,191	1,839	2,352
Panama	Encuesta de Niveles de Vida	2003	6,363	2,945	3,418
Asia					
Bangladesh	Household Income-Expenditure Survey	2000	7,440	5,040	2,400
Indonesia	Family Life Survey- Wave 3	2000	7,216	3,786	3,430
Nepal	Living Standards Survey I	1995-1996	3,370	2,655	715
Pakistan	Integrated Household Survey	2001	15,927	9,978	5,949
Vietnam	Living Standards Survey	1997-1998	6,002	4,272	1,730

Table 2. Share of rural income generating activities in total income.

Country and year	Income-generating activity														
	Group I							Group II			Group III			Group IV	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(1) + (2) + (3)	(4) + (5) + (6) + (7)	(1) + (2)	(4) + (5)	(6) + (7)	(3) + (4) + (5) + (6) + (7)		
	Agriculture- Crops	Agriculture - Livestock	Agricultural wage employment	Non-farm wage employment	Non-farm self- employment	Transfers	Other	Agricultural total	Non- Agricultural Total	On-Farm Total	Non-farm total	Transfers & Other	Off-farm Total	Transfers Public	Transfers Private
Albania 2005	17.2%	23.3%	2.8%	18.1%	7.4%	28.0%	3.2%	43.3%	56.7%	40.5%	25.5%	31.2%	59.5%	16.4%	11.6%
Bulgaria 2001	4.1%	11.5%	9.7%	11.5%	1.4%	60.7%	1.2%	25.2%	74.8%	15.6%	12.8%	61.9%	84.4%	56.7%	4.0%
Ghana 1998	55.0%	4.4%	1.4%	9.6%	20.5%	8.5%	0.5%	60.9%	39.1%	59.4%	30.1%	9.0%	40.6%	0.6%	7.9%
Madagascar 1993	57.3%	13.2%	6.5%	6.1%	8.5%	6.2%	2.2%	77.0%	23.0%	70.5%	14.6%	8.4%	29.5%	0.1%	6.1%
Malawi 2004	42.2%	12.9%	15.0%	8.4%	10.9%	10.1%	0.5%	70.2%	29.8%	55.2%	19.2%	10.6%	44.8%	3.5%	6.6%
Nigeria 2004	73.5%	4.3%	2.0%	7.1%	10.8%	1.7%	0.6%	79.8%	20.2%	77.8%	17.8%	2.4%	22.2%	0.3%	1.5%
Ecuador 1995	21.5%	9.1%	21.7%	18.5%	15.8%	5.5%	8.0%	52.3%	47.7%	30.6%	34.3%	13.5%	69.4%	0.5%	5.0%
Guatemala 2000	22.1%	3.5%	21.9%	20.9%	12.8%	18.2%	0.5%	47.5%	52.5%	25.6%	33.7%	18.8%	74.4%	12.9%	5.4%
Nicaragua 2001	21.5%	13.5%	21.5%	21.2%	11.5%	6.1%	4.7%	56.5%	43.5%	35.1%	32.7%	10.8%	64.9%	0.6%	5.4%
Panama 2003	19.9%	4.3%	17.0%	27.7%	14.1%	15.7%	1.3%	41.3%	58.7%	24.2%	41.8%	17.0%	75.8%	7.1%	8.6%
Bangladesh 2000	15.3%	2.2%	20.0%	19.7%	16.3%	13.2%	13.1%	37.6%	62.4%	17.6%	36.1%	26.4%	82.4%	3.3%	9.9%
Indonesia 2000	23.8%	2.1%	9.7%	20.3%	17.6%	22.9%	3.6%	35.5%	64.5%	25.8%	37.9%	26.5%	74.2%	1.5%	21.4%
Nepal 1996	29.4%	14.4%	18.3%	17.5%	9.3%	9.8%	1.2%	62.1%	37.9%	43.8%	26.9%	11.0%	56.2%	1.8%	8.0%
Pakistan 2001	22.4%	13.7%	8.2%	27.3%	10.1%	13.9%	4.4%	44.3%	55.7%	36.1%	37.4%	18.3%	63.9%	2.5%	11.4%
Vietnam 1998	36.2%	16.8%	6.4%	10.1%	22.5%	7.7%	0.3%	59.4%	40.6%	53.0%	32.6%	8.0%	47.0%	3.6%	4.0%

Table 3. Participation in rural income generating activities.

Country and year	Income-generating activity																
	Group I							Group II		Group III				Group IV			
	1	2	3	4	5	6	7	1+2+3	4+5+6+7	Agricultural total	Non-Agricultural Total	On-Farm Total	Non-farm total	Transfers & Other	Off-farm Total	Transfers Public	Transfers Private
Albania 2005	94.7%	85.4%	5.3%	30.0%	10.9%	74.4%	18.8%	95.4%	90.3%	95.2%	38.8%	75.8%	91.9%	58.9%	42.5%		
Bulgaria 2001	68.3%	66.5%	16.5%	20.2%	2.4%	89.3%	12.5%	80.7%	94.3%	76.9%	22.2%	90.6%	96.8%	87.9%	9.1%		
Ghana 1998	87.8%	51.4%	3.7%	17.7%	40.1%	41.3%	13.5%	88.9%	74.7%	88.7%	49.3%	48.5%	75.9%	1.9%	40.4%		
Madagascar 1993	93.4%	78.0%	26.0%	18.2%	21.3%	43.5%	11.4%	96.1%	67.0%	95.4%	35.5%	49.6%	75.0%	0.3%	43.3%		
Malawi 2004	92.7%	64.4%	54.9%	16.1%	29.9%	88.9%	6.6%	97.0%	93.4%	95.0%	41.7%	89.6%	97.1%	54.1%	77.4%		
Nigeria 2004	88.1%	43.8%	3.8%	9.2%	19.1%	6.3%	4.2%	89.5%	32.5%	89.3%	25.9%	9.7%	35.1%	1.3%	5.3%		
Ecuador 1995	73.6%	76.2%	39.2%	34.4%	38.8%	27.3%	48.5%	93.0%	85.4%	88.3%	56.6%	61.7%	94.1%	2.0%	25.7%		
Guatemala 2000	84.7%	66.1%	42.7%	34.6%	30.7%	65.3%	3.7%	92.6%	84.1%	89.9%	53.5%	66.6%	94.6%	58.1%	18.6%		
Nicaragua 2001	85.3%	72.3%	39.4%	35.3%	26.1%	38.7%	19.5%	95.0%	72.8%	91.6%	51.9%	42.8%	87.3%	2.4%	37.7%		
Panama 2003	77.4%	64.2%	30.4%	42.1%	28.3%	64.6%	11.5%	86.6%	86.5%	82.3%	58.5%	67.5%	93.9%	15.2%	58.6%		
Bangladesh 2000	61.2%	56.9%	35.4%	31.9%	25.7%	48.5%	55.0%	87.1%	90.5%	79.0%	53.1%	74.5%	97.4%	32.5%	26.5%		
Indonesia 2000	53.7%	10.2%	19.3%	31.8%	32.7%	85.4%	14.1%	64.3%	92.5%	54.4%	54.9%	87.0%	93.8%	7.4%	84.6%		
Nepal 1996	90.9%	80.4%	41.6%	35.4%	20.1%	26.4%	8.5%	97.6%	69.1%	94.5%	49.9%	32.4%	84.5%	3.5%	23.8%		
Pakistan 2001	47.5%	64.3%	20.0%	48.5%	17.8%	31.4%	15.7%	74.5%	78.1%	69.7%	57.9%	41.2%	84.8%	14.4%	20.5%		
Vietnam 1998	97.8%	90.8%	20.1%	31.9%	38.4%	36.4%	19.4%	99.0%	79.8%	98.5%	58.7%	48.4%	85.9%	19.6%	21.9%		

Table 4. Percent of rural households with diversified and specialized income generating activities.

Principal Household Income Source (>= 75% of Total Income)

	Diverse Income Portfolio	Ag Wage	Nonag wge	Self Emp	Transfers	Other	Farm
Albania 2005	54.8%	1.4%	9.1%	5.0%	9.8%	0.5%	19.4%
Bulgaria 2001	38.4%	4.8%	5.5%	1.1%	46.3%	0.2%	3.6%
Ghana 1998	23.9%	0.6%	6.1%	15.4%	3.5%	0.2%	50.3%
Madagascar 1993	30.6%	1.3%	2.8%	4.0%	1.4%	0.4%	59.4%
Malawi 2004	39.4%	5.6%	5.7%	5.0%	2.5%	0.0%	41.8%
Nigeria 2004	14.7%	1.0%	5.5%	7.8%	0.9%	0.2%	69.9%
Ecuador 1995	45.6%	13.2%	11.6%	8.9%	2.3%	1.0%	17.4%
Guatemala 2000	51.5%	10.9%	13.6%	5.9%	6.2%	0.2%	11.7%
Nicaragua 2001	43.2%	12.4%	14.5%	6.5%	0.8%	0.4%	22.4%
Panama 2003	41.0%	10.4%	20.2%	7.6%	7.3%	0.2%	13.3%
Bangladesh 2000	47.4%	10.9%	12.2%	10.3%	5.4%	2.0%	11.7%
Indonesia 2000	41.5%	5.9%	13.9%	10.4%	11.5%	1.1%	15.7%
Nepal 1996	50.7%	7.9%	7.1%	4.3%	3.5%	0.2%	26.3%
Pakistan 2001	36.4%	4.7%	18.1%	6.3%	8.4%	1.3%	24.9%
Vietnam 1998	44.8%	2.4%	2.3%	14.2%	1.5%	0.1%	34.7%

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

Table 5. 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	-4.2%	-10.2%	4.5%	24.3%	<u>82.7%</u>	1.7%	-4.8%	6.5%	1.3%	100.0%
Bulgaria 2001	8.3%	10.2%	<u>29.2%</u>	27.9%	7.1%	16.6%	12.5%	4.1%	0.8%	100.0%
Ghana 1998	18.4%	1.1%	1.6%	15.4%	<u>61.2%</u>	2.3%	0.1%	2.2%	0.0%	100.0%
Madagascar 1993	32.3%	12.1%	0.7%	-0.5%	<u>52.2%</u>	1.1%	0.2%	0.9%	2.0%	100.0%
Malawi 2004	<u>57.8%</u>	5.5%	0.0%	26.0%	12.5%	-2.0%	-0.9%	-1.1%	0.1%	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	<u>44.3%</u>	0.4%	3.3%	12.4%	26.9%	0.5%	0.3%	0.1%	7.8%	100.0%
Guatemala 2000	-5.7%	0.8%	3.7%	<u>56.5%</u>	36.7%	4.7%	-2.4%	7.0%	3.2%	100.0%
Nicaragua 2001	3.1%	7.3%	5.3%	35.1%	<u>40.4%</u>	3.5%	0.7%	2.8%	5.4%	100.0%
Panama 2003	-6.5%	0.5%	5.8%	<u>67.1%</u>	24.8%	6.3%	6.9%	-0.6%	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	1.2%	14.0%	-1.8%	25.4%	<u>39.1%</u>	17.5%	4.7%	<u>12.8%</u>	4.6%	100.0%
Pakistan 2001	<u>57.4%</u>	2.5%	-2.9%	3.3%	24.7%	1.5%	0.0%	1.5%	<u>13.4%</u>	100.0%
Vietnam 1998	-8.0%	-3.4%	-1.9%	1.1%	<u>112.0%</u>	-0.1%	-0.4%	0.2%	0.2%	100.0%

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

Figure 1. Share of rural on farm and non agricultural income by per capita GDP

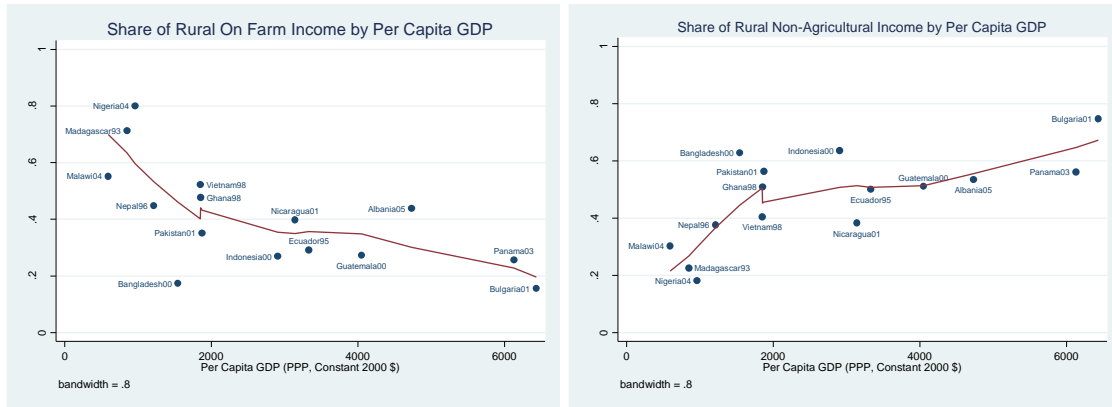
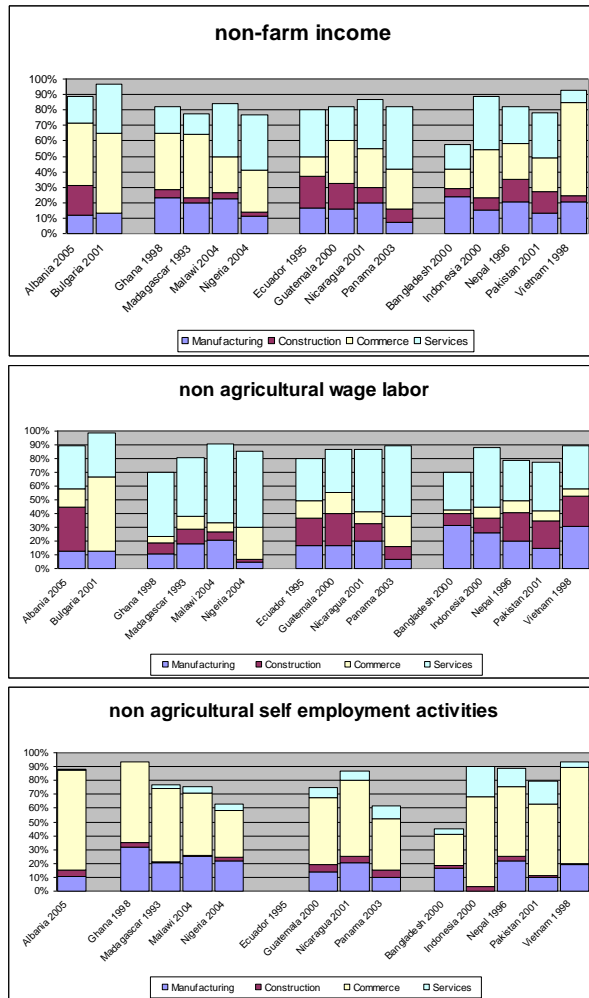
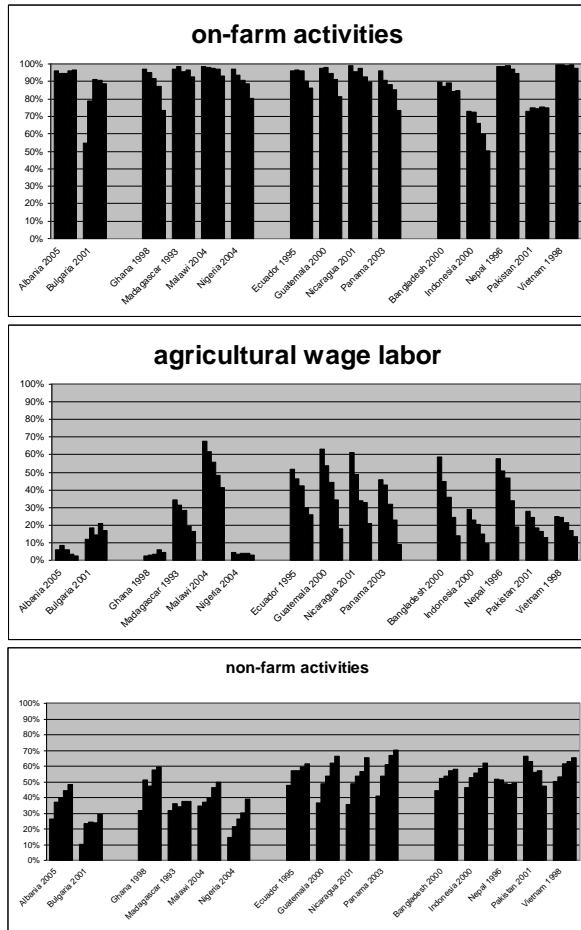


Figure 2. Composition of total non-farm income as well as non-agricultural wage labor and self employment, by sector



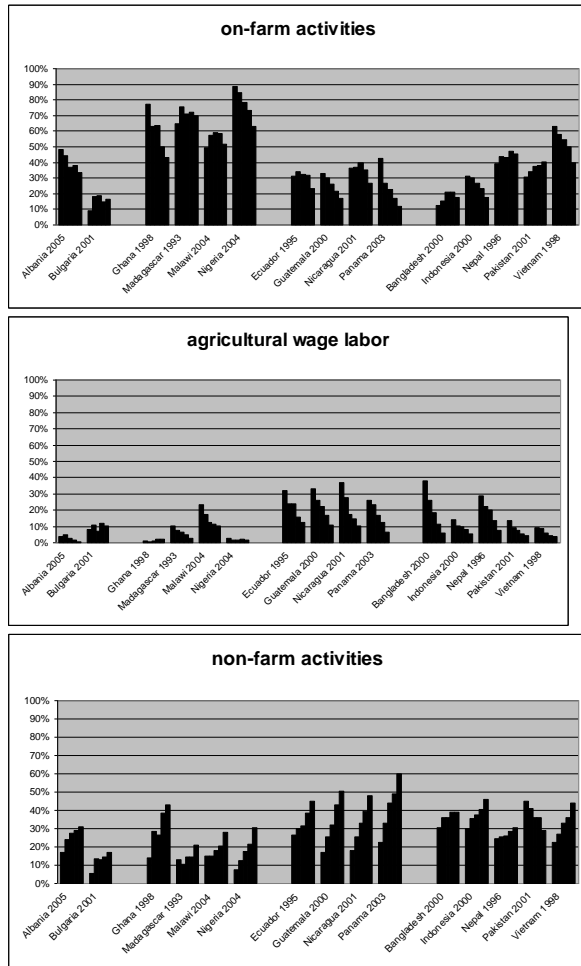
Note: Remainder of each column up to 100% is made up of other categories.

Figure 3. Percent of households participating in main income generating activities, by expenditure quintile



Note: expenditure quintiles move from poorer to richer.

Figure 4. Percent of total income from main income generating activities, by expenditure quintile



Note: expenditure quintiles move from poorer to richer.

Figure 5. Percent of rural households receiving public and private transfers, by expenditure quintile

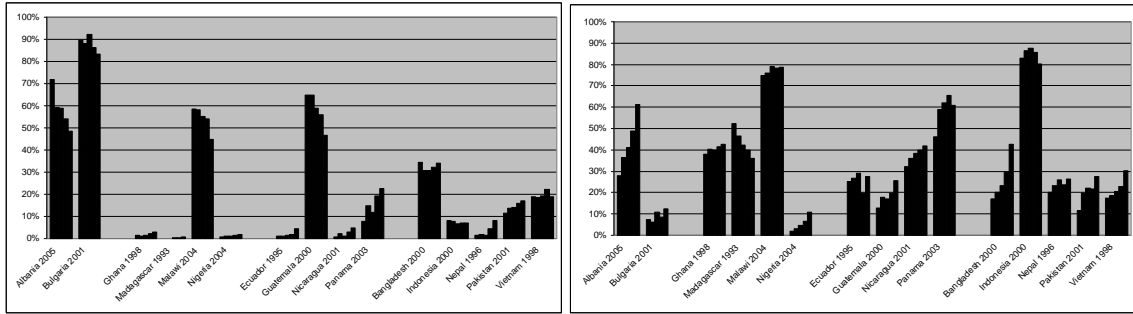


Figure 6. Percent of rural households with diversified income portfolio, by expenditure quintile

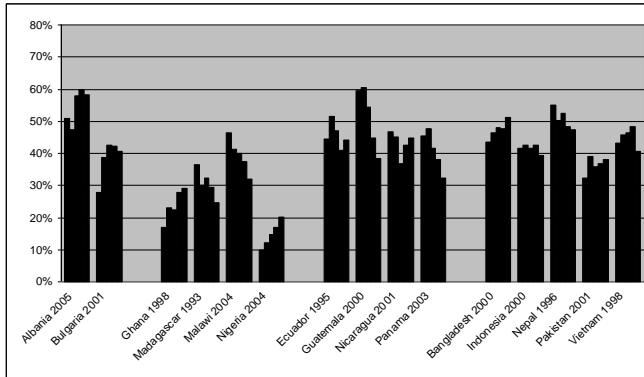


Figure 7. Share of diversified and on-farm specializing households, by per capita GDP

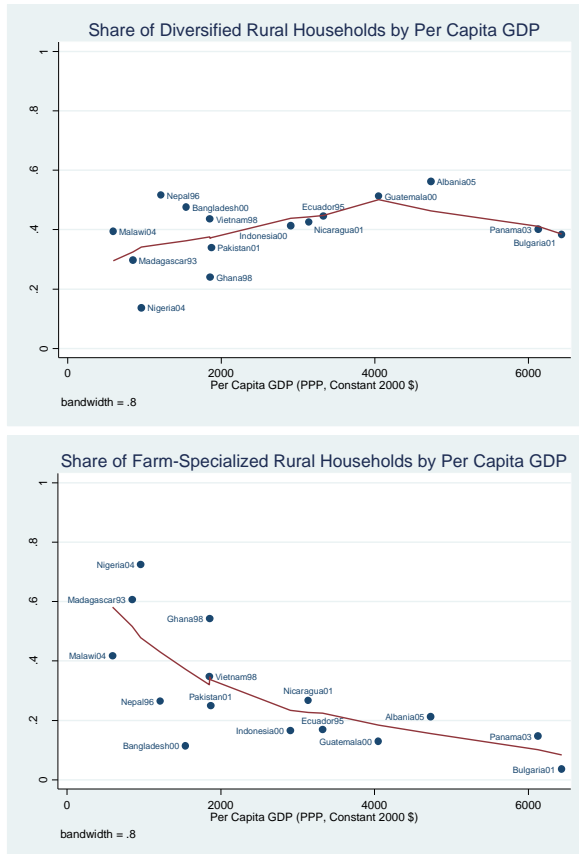


Figure 8. Percent of value of total agricultural production, by diversified and on farm specializing households

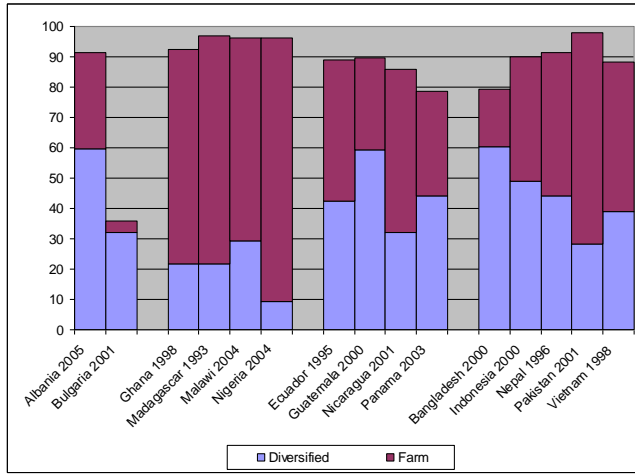
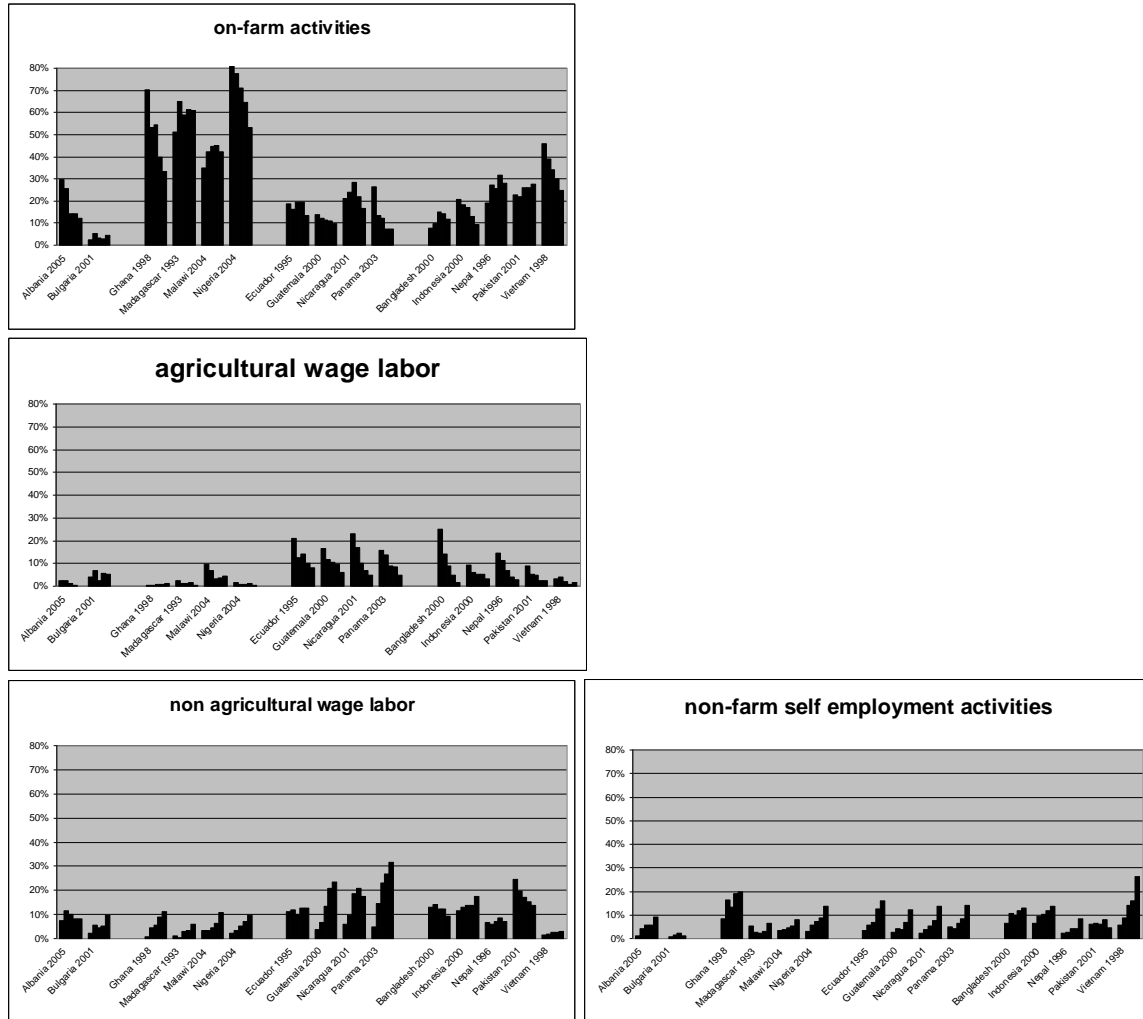


Figure 9 Percent of rural households specializing in main income generating categories, by expenditure quintile



¹ See, among others, FAO (1998), Reardon, Berdegue and Escobar (2001), Lanjouw and Lanjouw (2001) and Haggblade, Hazel and Reardon (2005)

² Evidence in this direction is provided for Latin America by FAO (1998) and for Asia by Haggblade, Hazel and Reardon (2005).

³ Up to date information on the RIGA database can be found at http://www.fao.org/es/ESA/riga/index_en.htm.

⁴ Details of the construction of the income aggregates can be found in Carletto, Covarrubias and Krausova (2007).

⁵ To define a comparable measure of rurality across countries would require, for example, data on population densities which implies having access to census or similar data that can be linked to the survey. These are generally not available.

⁶ See Barrett, Reardon and Web (2001) for a discussion of this point.

⁷ We do not make cross country comparisons using absolute poverty lines, as these are generally not considered comparable across countries. Instead we use relative poverty lines, in this case quintiles of household expenditure.

⁸ Note that the data come from national surveys designed to be representative of the population although in most cases the poor have been over sampled. Thus most calculations presented in the paper use sample weights to provide accurate estimates of the true values for the rural population.

⁹ Participation is defined as the receipt of any household income (negative or positive) by any household member from that income generating activity.

¹⁰ 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 and Azzarri et al (2006) for Malawi, for example, regarding the role of agricultural wage labor.