Rural Household Access to Assets and Agrarian Institutions: A Cross Country Comparison

Alberto Zezza[1,§], Paul Winters[†], Benjamin Davis[§], Gero Carletto[‡], Katia Covarrubias[§], Esteban Quiñones[§], Kostas Stamoulis[§], Luca Tasciotti[§] and Stefania DiGiuseppe[§]

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[1] Corresponding author (email: alberto.zezza@fao.org); [§] Agricultural Development Economics Division, Food and Agriculture Organization; [†] American University; [‡] World Bank. The views expressed in this paper are those of the authors and should not be attributed to the institutions with which they are affiliated. The excellent research assistance of Genny Bonomi, and Takis Karfakis is gratefully acknowledged. We would like to thank Karen Macours, Alain de Janvry, Elisabeth Sadoulet, Derek Byerlee, Ugo Pica Ciamarra and Gustavo Anriquez for constructive suggestions on the analysis of the data. We would also like to thank participants in the 2007 Agricultural Economics Society meetings in Reading and the 106th seminar of the European Association of Agricultural Economists for comments and discussion.

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Abstract

Agriculture is at the core of the livelihoods of a large share of rural households throughout the developing world. Agricultural growth is a major engine for overall economic growth and possibly the single most important pathway out of poverty in the rural space. This paper characterizes household access to assets and agrarian institutions of households engaged in agricultural activities in a sample of developing countries. The evidence presented in the paper draws from 15 nationally representative household surveys from four regions of the developing world. We find that the access of rural households to a range of agricultural-specific assets (including land and livestock) and institutions is in general low, though highly heterogeneous across countries, and by categories of households within countries. A large share of rural agricultural households do not use or have access to basic productive inputs, agricultural support services or output markets, and in general it is the landless and the smallest landowners who suffer significantly more from this lack of access. We relate this to the households' ability to engage successfully in commercial farming and find consistent supporting evidence for the hypothesis that this lack of access is significantly constraining their potential to engage successfully in agriculture.

Key Words: rural non farm, assets, agrarian institutions, household surveys.

JEL: O13, O57, Q12

1. Context: Assets, institutions, agriculture and poverty reduction

Assets are key determinants of household welfare. Ownership or access to a range of assets determines to a large extent the livelihood strategies of poor rural households and whether they manage to stay or get out of poverty. In agriculture, the combination of assets endowments and access to *agrarian institutions* is crucial in forming the incentives faced by agricultural households and their ability to respond to changes in markets and policy. This is why a sizeable share of the agricultural economics literature, particularly of that concerned with developing regions, is devoted to the study of issues such as the availability of different forms of capital, the performance of input, output, and factor markets, the delivery of agricultural support services and the generation and adoption of agricultural technology.

Although a significant amount of theoretical and empirical work focuses on the analysis of assets and agrarian institutions, we are not aware of any study that has carried out this type of analysis in a large cross section of countries using internally consistent data. The objective of this paper is to describe the asset position of rural agricultural households in a sample of developing and transitioning countries to document access to agrarian institutions and ultimately to characterize the heterogeneity of access to these assets and institutions. We then relate this to some measures of agricultural market orientation and successful engagement in agricultural production and commercialisation, to assess the extent to which constraints in access to assets and basic inputs limit households' ability to fully exploit the potential of agriculture to serve as a pathway out of poverty.

In this paper we classify assets into the following categories: human capital (education and household labour force)[2], natural capital (land access), physical capital (the ownership of assets such as livestock and machinery), public capital (access to public services and infrastructure such as schools, health clinics, and electricity), social capital (participation in organizations, associations and links to other individuals and households, both within and outside the community), financial capital (access to credit, insurance) and geographic capital (locational factors such as proximity to markets; Jalan and Ravallion 2002).

For each of these categories there exist vast strands of literature that document the relationships between assets and institutions and the economic performance of agricultural households, and it would be impossible to comprehensively review these contributions here. It will suffice to recall a few major points that emerge from this literature. First, the literature

[2] We do not deal with human capital issues in this paper. The role of education and labour endowments are covered in two companion papers.

mostly points to the microeconomic mechanisms through which access to assets, markets, services can have a positive impact on agricultural productivity and of the improvement of income levels of poor smallholders.

Second, when looking at the micro-macro connection, the positive association between economic growth and poverty reduction (Valdés and Foster 2005), has been shown to be diluted by inequality in asset distribution. That is because inequality in asset distribution puts a break on aggregate growth, while also reducing the income growth of the poorest strata of the population disproportionately (Birdsall and Londoño 1997).

Third, it has been shown how often the returns to a particular asset are greater if other complementary assets are also available to the household, in what has been referred to as "bundling of services." (Valdés and Mistiaen 2001; Dorward et al. 2003; Birdsall and Székely 2003). Although investments in individual assets can generate a positive impact for rural households, the impact may be greater and/or may not materialize *unless* access to multiple complementary assets is improved. For example, the ability of agricultural households to respond to commercial opportunities and benefit from farm-nonfarm linkages relies on access to skills, capital and input/output markets (Dorward et al., 2003).

Keeping in mind this micro and macro evidence on the importance of access to assets and assets distribution for the income of the poor, we now turn to discuss cross-country evidence on the distribution of assets and agrarian markets in a sample of developing and transition countries.

The paper is organised as follows. The next section describes the Rural Income Generating Activities (RIGA) database used for the analysis and discusses the approach taken in using the data for the purposes of the paper. Section 3 then focuses on household ownership of three key assets: land, livestock and infrastructure. Section 4 begins the examination of agrarian institutions by analyzing the utilization of productive inputs which reflects access to and functioning of markets for such inputs. This is followed in section 5 by an examination of the participation of agricultural households in output markets. In section 6 we characterize the support provided to rural households in terms of technology delivery, extension services and credit access, all of which are areas where governments have historically provided support to agricultural households. Section 7 presents results of a multivariate analysis aiming at investigating how access to assets, inputs and agrarian institutions relate to performance on agricultural output markets. The final section presents some concluding remarks.

2. The RIGA database and the analytical approach

The analysis presented in this 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. 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. 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 following countries were utilized (survey years in parentheses): Ghana (1998), Madagascar (1993), Malawi (2004), Nigeria (2004); Bangladesh (2000), Indonesia (2000), Nepal (1996), Pakistan (2001), Vietnam (1998); Albania (2005), Bulgaria (2001); Ecuador (1995), Guatemala (2000), Nicaragua (2001), Panama (2003). 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 insights into the fundamental aspects of livelihood strategies of rural households in the developing world. In this paper most of the analysis is performed on a sub-sample of rural households that are engaged in agricultural production to any extent. These are approximately 85 to 100 percent of the rural sample, depending on the country.

We analyze various dimensions of heterogeneity of access. A first dimension is across expenditure quintiles which serve as a proxy of well-being of rural households, thus allowing a comparison of access across poorer versus richer households. A second dimension of comparing households is by examining a particular asset to see if those with greater accumulation of that asset, such as land, have similar access to other assets or agrarian institutions. Finally, by virtue of examining data across a range of countries, we can also assess the heterogeneity of household variables across countries and regions.

In each of these cases, the objective is to identify the existence and degree of heterogeneity of access and establish conditions under which access varies. It should be noted, however, that in all of these comparisons establishing causality is difficult; what we are presenting are associations. Furthermore, it is also difficult to establish the reasons why heterogeneity exists

in a particular context. As with any descriptive cross sectional analysis of this type, the inferences made in this paper serve to characterize heterogeneity of access, but cannot identify the factors which generate this heterogeneity. In particular we do not attempt to discriminate supply and demand side issues in access to assets and input markets.

3. Household access to key assets

In this section, we examine the access of rural households to three key assets: i) land, ii) livestock and iii) infrastructure.

3.1 Land

Land is the asset that has historically been most closely linked to rural development. Policies for promoting rural development have often centred on providing access through a variety of types of land reform, under the assumption that land access is critical for agricultural production and thus food security and income generation for rural households. In this section, we examine land access by looking at ownership, the link between land ownership and expenditure quintile, and alternative mechanisms of access to land.

Most rural households have no land, or only small plots of land, as seen in Figure 1, which presents histograms of the different land ownership categories by country for each region. Landlessness is most prevalent in Latin America and Asia, reaching from 40 to over 60 percent of households, as can also be seen in Table 1. The prevalence in Ghana is also high, though we suspect that these numbers mask collective forms of land access which are not captured in this variable; we follow up on this suspicion below. Landlessness is least prevalent in Vietnam, Malawi and Albania, at around 10 percent. In some of these countries alternative forms of access to land are common, again which we discuss below.

Not owning agricultural land does not necessarily represent a situation of disadvantage for rural households, as landlessness may signal either transition out of agriculture into higher return activities, or a land-constrained household desirous of producing agricultural output. Indeed, we find in Table 1 that the share of rural households that own land tends to decrease with increasing levels of household wealth. This is true in all four of the Latin American countries, as well as Nigeria and Indonesia. In the other three African countries land ownership is more or less constant across quintiles, as is also the case in Nepal, Vietnam and Albania. Only in Bangladesh, Pakistan and Bulgaria does the share of rural households owning agricultural land increase with expenditure quintile.

Table 1. Percentage of rural households owning land, by expenditure quintiles

	Percentage of Land-Owning Households					
	Expenditure Quintiles					
	1	2	3	4	5	All
Africa						
Ghana 1998	11.6	27.1	35.0	34.9	34.2	28.5
Madagascar 1993	73.5	81.0	75.3	73.3	69.8	74.6
Malawi 2004	94.7	94.9	93.4	91.7	82.3	91.4
Nigeria 2004	65.4	70.2	70.2	72.2	73.0	70.2
Asia						
Bangladesh 2000	32.7	40.7	52.5	55.9	63.6	49.1
Indonesia 2000	n/a	n/a	n/a	n/a	n/a	n/a
Nepal 1996	75.5	79.4	79.4	78.4	80.5	78.6
Pakistan 2001	20.4	27.9	35.2	37.9	42.1	32.7
Vietnam 1998	91.8	93.3	90.8	90.8	84.5	90.2
Eastern Europe						
Albania 2005	92.0	91.8	94.2	97.0	95.1	93.9
Bulgaria 2001	34.1	61.7	76.1	78.9	75.4	65.2
Latin America						
Ecuador 1995	63.7	63.3	56.0	52.2	53.2	57.7
Guatemala 2000	62.9	59.8	53.0	44.6	37.7	51.6
Nicaragua 2001	45.8	44.0	45.3	40.1	32.9	41.7
Panama 2003	68.7	54.1	49.3	45.1	36.5	50.8

Landholdings in most countries are small, with the vast majority less then one hectare in size. A greater number of larger landholdings are found in Latin America, as reflected in Figure 1 and Table 2, the latter of which provides mean land ownership for all rural households and agricultural households along with a breakdown of ownership by expenditure quintiles. The size of average landholding varies from 0.2 hectares in Vietnam to around 6 hectares in Panama for all rural households and similarly for agricultural households with a higher value of nearly 8 hectares for Panama. Average land holdings are smallest in Asia and Eastern Europe and largest in Latin America most likely reflecting differences in population densities and, for transition countries in Eastern Europe, the specific patterns of decollectivisation followed by these two countries following the collapse of the socialist system.

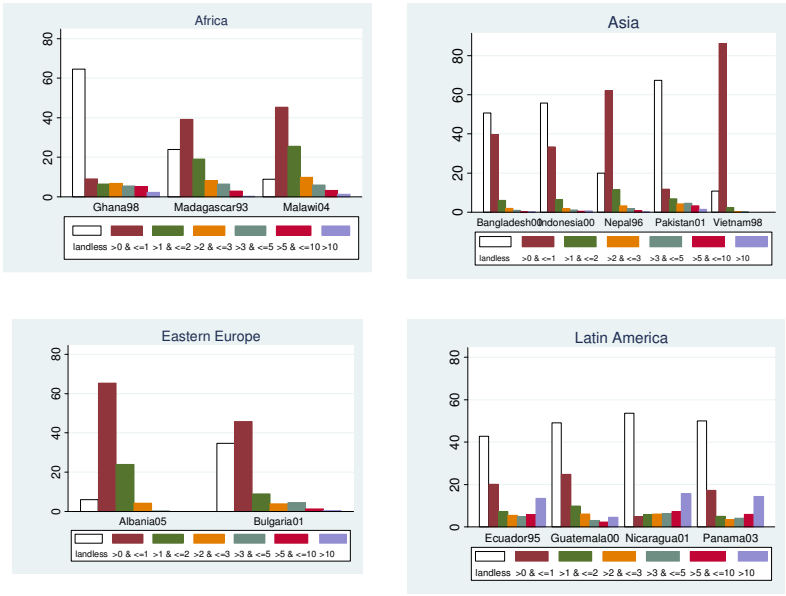
Table 2. Land ownership (has), by expenditure quintiles

	Average Land Size (has, Rural Households)						Average Land Size (has, Agricultural Households)					
	Expenditure Quintiles						Expenditure Quintiles					
	1	2	3	4	5	All	1	2	3	4	5	All
Africa												
Ghana 1998	0.88	0.92	1.23	1.30	1.34	1.14	0.91	0.97	1.34	1.47	1.82	1.29
Madagascar 1993	0.90	1.19	1.05	1.18	1.40	1.14	0.92	1.21	1.11	1.26	1.51	1.20
Malawi 2004	1.21	1.42	1.57	1.63	1.67	1.50	1.24	1.45	1.62	1.69	1.85	1.57
Nigeria 2004	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Asia												
Bangladesh 2000	0.12	0.20	0.28	0.44	0.73	0.35	0.15	0.24	0.33	0.54	0.84	0.43
Indonesia 2000	1.09	0.86	0.71	0.80	0.68	0.83	1.51	1.37	1.23	1.56	1.52	1.43
Nepal 1996	0.41	0.61	0.54	0.73	0.70	0.60	0.46	0.65	0.57	0.77	0.75	0.64
Pakistan 2001	0.47	0.57	0.85	1.05	1.55	0.90	0.73	0.84	1.19	1.45	2.11	1.28
Vietnam1998	0.15	0.19	0.20	0.21	0.27	0.20	0.15	0.19	0.21	0.21	0.27	0.21
Eastern Europe												
Albania 2005	0.68	0.71	0.84	0.85	0.96	0.81	0.72	0.73	0.87	0.88	0.99	0.84
Bulgaria 2001	0.44	0.56	0.75	0.64	0.96	0.67	0.81	0.66	0.74	0.75	1.12	0.82
Latin America												
Ecuador 1995	4.22	3.73	4.10	5.92	10.41	5.67	4.57	3.90	4.42	6.60	9.06	5.62
Guatemala 2000	1.70	1.99	1.61	1.26	2.97	1.91	1.81	2.07	1.77	1.42	3.74	2.12
Nicaragua 2001	3.62	4.77	7.87	5.35	7.52	5.81	3.87	5.16	8.38	5.88	8.51	6.33
Panama 2003	5.66	4.37	5.16	7.16	9.02	6.27	6.24	5.16	6.10	8.80	12.85	7.61
mean	*1.54*	*1.58*	*1.91*	*2.04*	*2.87*	*1.99*	*1.72*	*1.76*	*2.13*	*2.38*	*3.35*	*2.24*
max	*5.66*	*4.77*	*7.87*	*7.16*	*10.41*	*6.27*	*6.24*	*5.16*	*8.38*	*8.80*	*12.85*	*7.61*
min	*0.12*	*0.19*	*0.20*	*0.21*	*0.27*	*0.20*	*0.15*	*0.19*	*0.21*	*0.21*	*0.27*	*0.21*

Landholdings tend to be concentrated, although this varies by country and region. Landholdings in the Latin American countries are the most concentrated, with between 70 and 80 percent of total land held by the top quintile of land owners. For most of the countries in Asia, around 60 percent of total land is held by the largest quintile (Indonesia is the exception, with 83 percent), while the African countries follow with around 55 percent. Albania is the country where land is most equitably distributed, with only 43 percent held by the top quintile.

Looking back at Table 2, there is generally a positive relationship between average size of land owned and welfare, although in Indonesia the poor own on average larger plots and in other cases it is apparent at the extremes but not in the central part of the welfare distribution (as in the four Latin American countries). This can be read as confirmation that for a number of these households, even if landed and to some extent involved in agriculture, assets other than land are proving more crucial in determining welfare levels.[3]

Figure 1. Land distribution, by region and land category (in hectares)



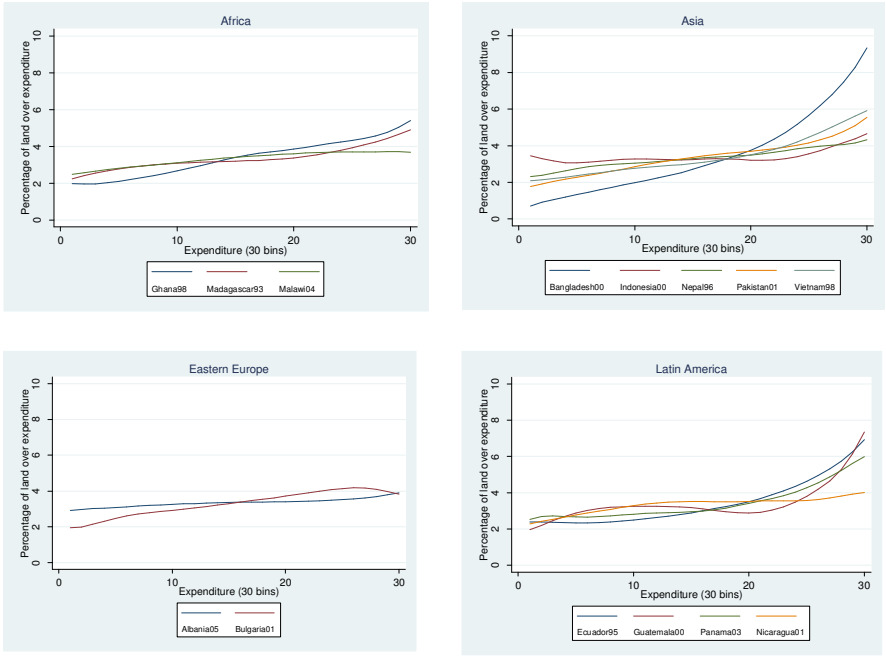
To get a sense of who in the distribution owns the greatest share of land in a given country, Figure 2 presents the relationship between expenditures levels and the share of total land owned, smoothed using a Lowess distribution. In all countries, the line is upward sloping

[3] The fact that our land ownership variable does not account for differences in land quality can also be part of the explanation.

indicating that wealthier agricultural households[4] own a greater share of total agricultural land than poorer households. In Asia, for example, the lower expenditure groups each own around 2-3% of total land while the highest groups own twice that amount, with particular concentration in Bangladesh[5]. In Latin America, particularly sharp increases are seen at the higher end of the distribution suggesting greater land concentration among the wealthiest.

In addition to ownership, rural households access productive land through other forms of tenancy. These mechanisms may include land in exchange for payment (whether cash or in kind), or through reciprocity or traditional exchanges. We focus first on exchange for payment, which includes rental and sharecropping. Figures 3 and 4 below report the share of households by rural household land ownership quintile that, respectively, rent and sharecrop in and rent and sharecrop out land in the set of countries analyzed. For renting/sharecropping out, the landless category (category 0) is, of course, excluded.

Figure 2. Land concentration by expenditure (30 bins), by region (Lowess distribution)

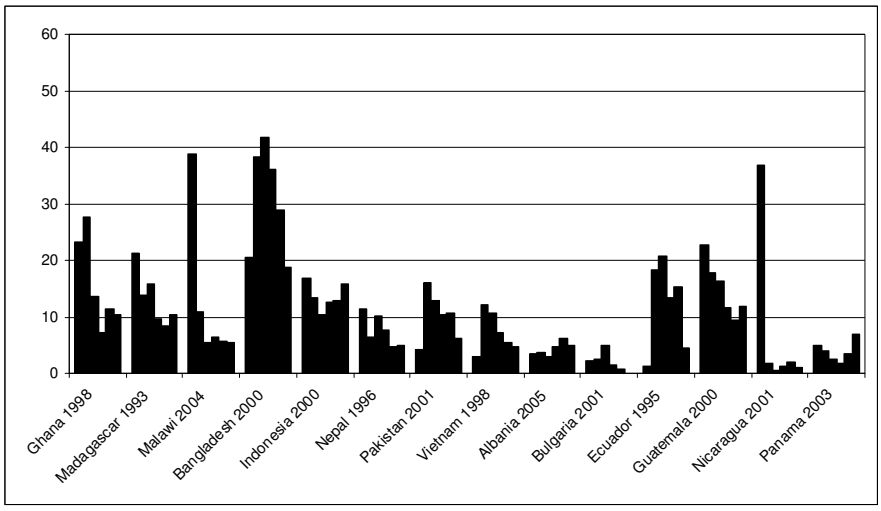


As expected, renting in land and sharecropping are particularly widespread in South Asia, but the phenomenon is also significant in several African and Latin American countries. In

[4] Agricultural households are defined as those with non zero agricultural income.
[5] In Vietnam we classify as landowners those who have land classified in the survey as owned, allocated, auctioned, private land, or land of long term use.

Pakistan and Bangladesh, 15 and 27 percent of households, respectively, rent in land. In Africa, the total share is about 20 and 15 percent in Ghana and Malawi, and in Latin America 18 percent in Guatemala and 14 percent in Panama. Not only the landless rent or sharecrop. It is, however, the landless and the smaller land classes in particular that access land through these alternative forms of tenancy, although in some cases (Bangladesh and Nepal) this is more of an option for the households in the middle of the land distribution. Rental markets and sharecropping are thus an important avenue for smallholders to access more land and more income, but, depending on the country, are also used by households in the middle of the distribution.

Figure 3. Percentage of agricultural households that rent and/or sharecrop in land, by land ownership quintile

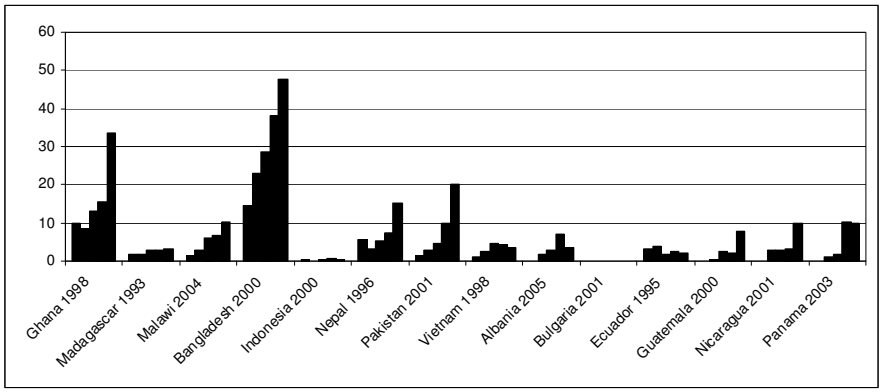


Note: The bars represent the six land categories (from left to right landless and the five land quintiles).

Renting and/or sharecropping land out, on the other hand, is generally associated with larger landholdings. There are, however, a few cases in which there appears to be more renting out among the smallest category than in the middle of the distribution. This may reflect an inability to gain economies of scale in production that push smallholders to rent out land, or if land is fragmented it may suggest some land is rented out while other is rented in. Taken together, this again suggests that land rental markets play an important role in reallocating land use towards smaller landholdings and may be allowing poorer farming households to put together more economically viable farm units.[6]

[6] And, to the extent that an inverse farm size-productivity relationship holds, this may also be contributing to improving the productivity of the farm sector.

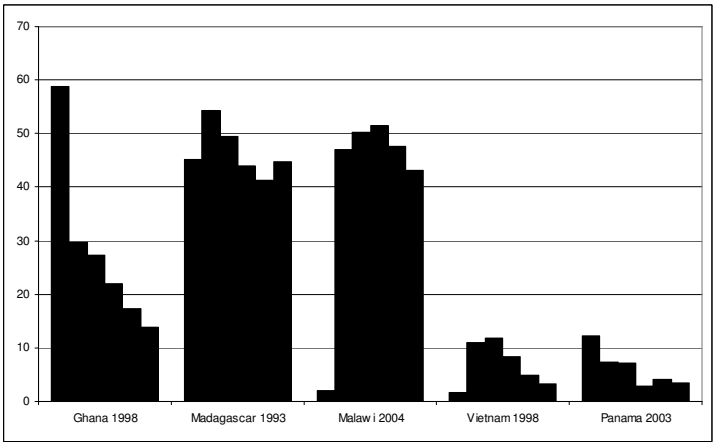
Figure 4. Percentage of agricultural households that rent and/or sharecrop out land, by land ownership quintile



Note: The bars represent the five land quintiles (from left/smallest to right/largest).

Mechanisms via reciprocity or traditional exchanges which do not involve payment, such as communal or village land or free exchanges from family or friends are also important. Figure 5 below reports the share of households by land ownership quintile that access land via non payment mechanisms. As was expected, these forms of access are particularly important in the African countries. In the case of Ghana, almost 60 percent of landless households had access to communal land, explaining, as we hypothesized earlier, the high share of landless among rural households in that country. Access via reciprocal or traditional exchange is also important for households in all land categories in Madagascar and Malawi.

Figure 5. Percentage of agricultural households that access land via reciprocal or traditional means, by land ownership quintile



Note: The bars represent the six land categories (from left to right landless and the five land quintiles).

3.2 Livestock

Livestock constitutes an asset that is widely owned by rural households in developing countries and performs a crucial role as a saving and risk management instrument, while at the same time contributing to the generation of income and to food security. Despite its importance, issues of access to livestock have not been quite as extensively researched as issues related to land and human capital, and there is a tendency to consider them important solely for particular population subgroups (herders and pastoralists), while focusing most of the analysis of agricultural livelihoods on crop activities.

Table 3. Livestock holdings (TLU)

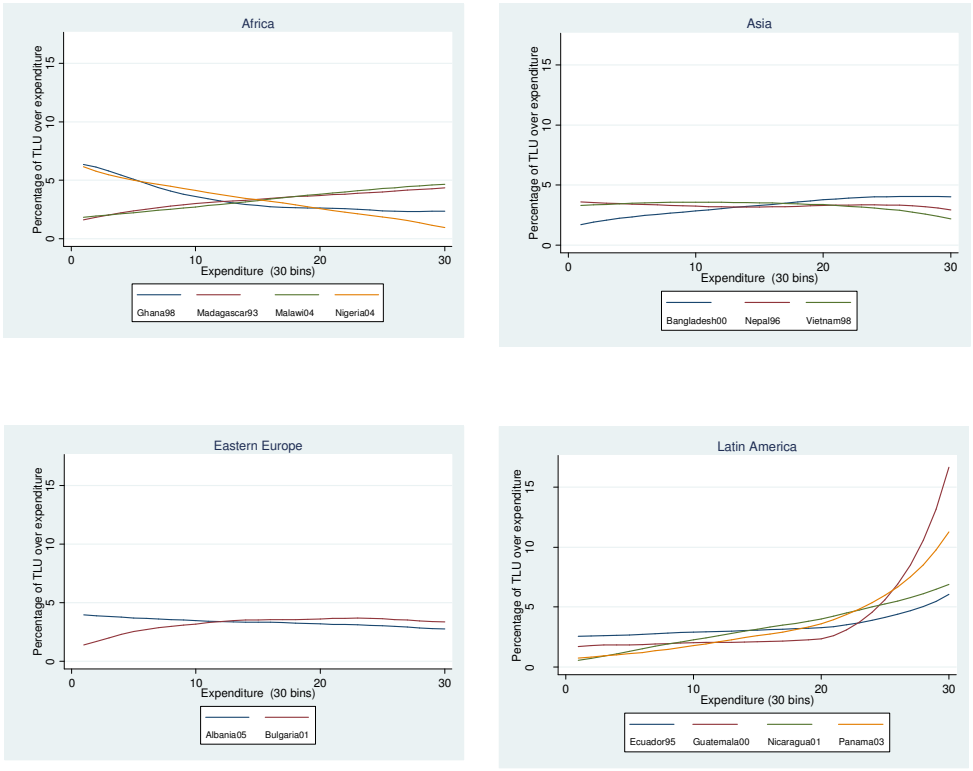
	Households owning livestock (%)	Livestock holdings (TLU)	Households owning cattle (%)	Cattle owned (#)	Among owners, livestock holdings (TLU)	Share of livestock owned by the top 20% of livestock holders
Africa						
Ghana 1998	50.1	0.67	7.2	0.46	1.34	69.5
Madagascar 1993	76.7	1.56	33.4	2.34	2.04	73.9
Malawi 2004	62.8	31.78	4.8	0.20	0.51	74.5
Nigeria 2004	46.4	0.71	9.4	0.60	1.54	66.6
Asia						
Bangladesh 2000	61.7	0.53	36.8	0.89	0.86	51.9
Nepal 1996	88.3	1.72	79.8	2.95	1.96	42.3
Pakistan 2001	47.0	N/A	44.0	N/A	N/A	N/A
Vietnam 1998	82.1	1.09	34.2	0.60	1.33	50.9
Eastern Europe						
Albania 2005	84.1	1.52	65.7	1.17	1.81	49.2
Bulgaria 2001	68.2	0.51	20.6	0.31	0.75	51.2
Latin America						
Ecuador 1995	84.4	2.81	31.2	2.47	3.32	71.4
Guatemala 2000	70.2	0.93	11.0	0.75	1.32	78.3
Nicaragua 2001	55.3	2.13	22.8	2.38	3.86	77.6
Panama 2003	60.8	1.90	12.9	2.40	3.14	92.9

Holdings measured in tropical livestock units (TLU). Source of TLU conversion factors: FAO GLiPHA

The data in Table 3 confirm the widespread ownership of livestock in the developing world. Between 46 and 85 percent of the rural households in the analyzed countries own some livestock such as cattle, horses, mules, goats, sheep or chickens. The type of livestock owned is however much more context specific; while in some countries (Nepal, Pakistan and to some extent Albania) most livestock owners own some cattle, in other countries (and notably in all our African countries) the bulk of herds are formed of smaller animals. To get a sense of overall ownership, we aggregate livestock into tropical livestock units (TLU), based on region-specific weights. Cattle, for example, have a value of around 0.7 compared to sheep and goats at 0.1 and chickens at 0.01. As is the case for land holdings, livestock holdings on average tend to be small in size, ranging from .32 in Malawi to 2.77 in Ecuador. Even among livestock owners, holdings range from .51 in Malawi to almost 4 in Nicaragua. By region, they tend to be smaller in Africa and Asia, and larger in Latin America.

As is the case with agricultural land, the share of households that own livestock is not necessarily positively related to well-being as measured by consumption expenditure. This is true only in Bangladesh, Pakistan and Bulgaria. In Latin America as well as Ghana and Nigeria, wealthier households are less likely than poorer households to own livestock. As also shown in the table, however, average holdings tend to increase with wealth, with the exception of Ghana, Nigeria, Vietnam and Albania.

Figure 6. Livestock concentration across the expenditure distribution (30 bins), by region (Lowess distribution)



While ownership of livestock is relatively evenly distributed, total livestock holdings are concentrated, both over livestock owners and wealth, and particularly in Latin America. Among the countries in this region, the top quintile of livestock owners (in terms of size of holdings) hold between 71 and 93 percent of total livestock, followed by the African countries, with between 67 and 75 percent (last column in Table 3). Herds are relatively less concentrated in the Asian and Eastern European countries, where the same indicator stands at around 50 percent. The particular concentration of livestock in Latin America is most evident in Figure 6, which presents the relationship between expenditure levels and the share of total livestock owned, using a Lowess distribution. Wealthier agricultural households also own a greater share of total livestock in Malawi, Madagascar and Bangladesh. Contrary to the land

distribution by wealth in Figure 2, however, livestock are progressively distributed in a number of countries, including Ghana, Nigeria, Albania, Nepal and Vietnam.

3.3 Infrastructure

Greater access to infrastructure is assumed to imply reduced time and distance to urban centres and facilitated access to markets. Households with greater access to electricity, water, communication, roads and other forms of infrastructure will have a broader range of economic opportunities compared to those with less access, who may be limited to agricultural activities for subsistence or near subsistence. Access to infrastructure, as a proxy for access to input and product markets, may also positively influence the type of agricultural activity towards more remunerative production technologies.

The difficulty in examining infrastructure is in identifying a measure comparable across countries. While most surveys include questions on infrastructure and distances to urban areas and key services, few of the variables are comparable. To address this issue, an infrastructure access index, including both public goods (electricity, telephone, etc.) and distance to infrastructure (schools, health centres, towns, etc.) was created using principal components analysis (following Filmer and Pritchett, 2001). The variables included in the index vary by country depending on data availability. Since infrastructure is generally linked to proximity to urban areas, the measure captures both jointly. In Table 4, the infrastructure index, which is normalized to have a mean zero in all cases, is presented for each country, by expenditure quintile. The higher the value of the index, the greater is the access to infrastructure. As can be seen in the table, not surprisingly, access to infrastructure increases with wealth, illustrating the constraints in terms of opportunities and services for the poor in all of the countries of the RIGA dataset.

Table 4. Infrastructure index

	Infrastructure Index					
	Expenditure Quintiles					
	1	2	3	4	5	All
Africa						
Ghana 1998	-0.58	-0.22	0.01	0.30	0.48	0.00
Madagascar 1993	-0.20	-0.17	0.03	0.08	0.25	0.00
Malawi 2004	-0.18	-0.16	-0.12	0.00	0.45	0.00
Nigeria 2004	-0.43	-0.19	-0.05	0.17	0.39	-0.03
Asia						
Bangladesh 2000	-0.40	-0.28	-0.10	-0.08	0.70	0.00
Indonesia 2000	-0.35	-0.15	0.01	0.11	0.38	0.00
Nepal 1996	-0.30	-0.27	-0.18	0.12	0.65	0.00
Pakistan 2001	-0.25	-0.15	-0.04	0.08	0.36	0.00
Vietnam 1998	-0.42	-0.12	-0.04	0.18	0.41	0.00
Eastern Europe						
Albania 2005	-0.31	-0.18	0.00	0.12	0.37	0.00
Bulgaria 2001	-0.59	-0.08	0.07	0.21	0.40	0.00
Latin America						
Ecuador 1995	-0.21	-0.14	0.01	0.11	0.24	0.00
Guatemala 2000	-0.40	-0.22	0.00	0.06	0.57	0.00
Nicaragua 2001	-0.37	-0.11	-0.09	0.10	0.47	0.00
Panama 2003	-0.91	-0.41	0.08	0.32	0.93	0.00

4. The utilization of productive inputs

Access to both input and output markets, and the economic opportunities they offer, is a key factor for households which depend on agricultural and other self employment activities for their livelihoods. Ideally one would hope to have information on access to markets, exogenous to the household decision to participate in a given market. This decision is typically influenced by household characteristics, such as its asset position, as well as the economic context. Unfortunately, such a measure is not available, so the best proxy is whether they actually did purchase and sell in input and output markets. This presumes that non use implies non access which is not necessarily the case. It does, however, provide a reasonable approximation for access, and comparison across land ownership quintile allows an assessment of how access varies with farm size.

In this section, we focus on looking at access to input markets for agricultural households. Four inputs in particular are considered: i) fertilizer, ii) pesticides, iii) mechanisation, and iv) hiring of labour. For agricultural households in each country, Tables 5 and 6 present data on the share of households that use the four inputs, both overall and by land ownership category. These categories include the landless (category 0) that own no land but do earn income from some agricultural activity and then the five quintiles of land ownership (categories 1-5) with 1 being the smallest landholding category and 5 the largest. Note that we only have information on whether fertilizers were used, and not how much was used, which could lead to an underestimation in terms of differences in actual fertilizer use among households.

Overall the results suggest a wide range of access to inputs across the countries studied. For fertiliser use, we see generally lower prevalence of use in Africa compared to Asia and Eastern Europe, except in Malawi where the Starter Pack program and tobacco production led to raised input use. Similarly, the countries of Latin America have lower use, with the exception of Guatemala where the production of non-traditional exports may have influenced results. Fertilizer use is highest in Albania and Vietnam, covering almost 90 percent of households. Few significant differences are evident in the use of fertilizers between the smallest and largest landholders, not surprisingly since no distinction is made between organic and inorganic sources of fertilizer. A lower share of landless agricultural households, however, in most countries used fertilizers.

Pesticide use appears generally lower than fertiliser use but varies widely by country and within regions, responding to climate, policy and the nature of pesticide products. Vietnam and Albania again have the highest prevalence of use, with 81 and 51 percent of agricultural

households, respectively, while only 3 percent of agricultural households in Malawi used pesticides. A consistent one third of the agricultural households in each of the Latin American countries also used pesticides. Much larger variation among small and larger landholders is evident for almost all of the countries, however, then in the case of fertilizer. Again this is not surprising, since pesticides nearly always involve a monetary payment. One exception is Vietnam, where use is over 80 percent in all categories, suggesting that government policy may be playing a role. Finally, with the exception of Latin America, very few landless agricultural households used pesticides.

Table 5. Utilization of productive inputs: fertilizer and pesticides, by land quintiles

	Share (%) of agricultural households using fertiliser						
	Land Quintiles						
	0	1	2	3	4	5	All
Africa							
Ghana 1998	20.6	24.9	18.8	23.0	24.8	23.1	21.6
Madagascar 1993	12.7	24.6	19.0	13.0	11.1	13.1	15.5
Malawi 2004	51.1	56.7	63.5	71.0	73.1	78.9	67.6
Asia							
Bangladesh 2000	29.1	73.3	86.4	88.3	88.2	89.0	62.2
Indonesia 2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nepal 1996	30.2	49.6	56.3	59.5	65.6	65.4	55.2
Pakistan 2001	27.0	77.9	84.4	86.9	88.1	88.6	54.1
Vietnam 1998	12.9	96.6	96.8	95.1	95.4	96.3	89.1
Eastern Europe							
Albania 2005	20.5	79.1	85.0	92.1	91.1	95.2	87.7
Bulgaria 2001	7.0	58.1	65.7	69.1	64.5	55.2	53.4
Latin America							
Ecuador 1995	19.4	16.6	37.0	44.9	33.1	26.7	27.9
Guatemala 2000	39.1	85.9	87.8	85.7	86.2	71.1	64.6
Nicaragua 2001	23.4	40.6	36.8	40.2	36.8	39.6	30.3
Panama 2003	10.9	21.0	21.0	22.4	27.0	20.1	21.6

	Share (%) of agricultural households using pesticides						
	Land Quintiles						
	0	1	2	3	4	5	All
Africa							
Ghana 1998	12.9	18.4	18.5	21.4	30.8	46.2	18.0
Madagascar 1993	12.4	9.0	11.1	13.0	10.3	12.8	11.5
Malawi 2004	2.4	0.7	2.1	3.2	3.7	7.4	3.3
Asia							
Bangladesh 2000	16.6	44.6	54.4	62.2	63.5	71.5	41.8
Indonesia 2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nepal 1996	0.9	3.4	4.1	8.3	13.1	15.2	7.8
Pakistan 2001	15.8	33.6	43.8	54.6	62.4	66.5	32.7
Vietnam 1998	7.5	85.2	87.6	88.4	87.3	91.9	81.1
Eastern Europe							
Albania 2005	5.1	33.0	38.2	47.1	57.5	71.8	50.9
Bulgaria 2001	1.8	12.0	26.5	27.6	31.5	24.1	20.5
Latin America							
Ecuador 1995	22.4	20.6	39.8	48.2	46.8	39.7	33.5
Guatemala 2000	28.4	22.2	30.1	31.1	50.0	59.8	34.2
Nicaragua 2001	23.5	38.0	42.3	51.3	43.5	65.2	34.1
Panama 2003	9.5	12.4	24.7	25.8	34.7	40.6	20.1

Mechanization—which is defined as using an input that uses a motor of some form— is limited among the agricultural households in the countries of the RIGA dataset, reaching over 20 percent in only 5 countries (Bulgaria, Nicaragua, Ecuador, Vietnam and Panama). The use

of mechanisation, however, shows the clearest influence of land size on input use. In every country greater land size is associated with greater mechanisation. These general results, of course, may be due to the fact that larger farms substitute capital for labour since they are likely to have lower labour to land ratios. Alternatively, it could indicate a lack of access of smallholders who cannot afford to pay for access to mechanical inputs or lack access to necessary credit, as mechanization typically requires a monetary payment.

Table 6. Utilization of productive inputs: mechanisation and hired labour, by land quintiles

	Land Quintiles						
	0	1	2	3	4	5	All
Africa							
Ghana 1998	2.2	3.4	2.3	3.4	6.1	13.8	3.5
Madagascar 1993	9.1	10.2	14.4	18.6	27.6	32.0	17.5
Malawi 2004	4.9	1.3	1.3	2.3	4.5	6.7	3.3
Asia							
Bangladesh 2000	0.8	1.0	4.5	4.7	10.0	20.0	5.1
Indonesia 2000	0.5	2.7	4.0	4.2	4.2	10.9	2.4
Nepal 1996	0.5	1.6	1.9	3.4	8.4	28.6	7.6
Pakistan 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vietnam 1998	1.6	16.2	23.5	21.5	23.4	33.7	21.3
Eastern Europe							
Albania 2005	9.0	6.2	17.1	16.2	24.8	29.5	19.8
Bulgaria 2001	16.7	16.2	30.4	40.7	46.8	51.7	33.1
Latin America							
Ecuador 1995	11.3	12.2	22.8	31.3	38.7	59.6	24.7
Guatemala 2000	4.5	13.4	8.3	13.1	13.3	17.6	9.4
Nicaragua 2001	14.7	35.4	41.0	56.3	55.5	71.7	31.0
Panama 2003	6.9	10.8	20.8	28.1	39.9	63.6	21.3

	Land Quintiles						
	0	1	2	3	4	5	All
Africa							
Ghana 1998	64.0	68.2	61.4	70.8	78.5	88.2	67.5
Madagascar 1993	32.8	41.1	39.7	34.9	34.9	45.2	37.6
Malawi 2004	29.2	16.5	18.6	20.8	26.9	31.7	23.3
Asia							
Bangladesh 2000	18.6	38.6	59.6	69.4	73.8	74.9	44.9
Indonesia 2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nepal 1996	22.8	21.8	32.5	34.0	45.2	60.4	37.3
Pakistan 2001	15.3	16.6	27.7	46.0	62.4	67.5	28.6
Vietnam 1998	1.6	16.2	23.5	21.5	23.4	33.7	21.3
Eastern Europe							
Albania 2005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulgaria 2001	1.8	0.0	2.0	0.8	1.6	4.6	1.6
Latin America							
Ecuador 1995	12.0	11.1	19.4	33.4	44.7	50.3	24.3
Guatemala 2000	18.7	33.0	43.3	40.2	45.8	55.1	32.8
Nicaragua 2001	6.4	10.1	13.8	23.4	24.3	27.4	12.2
Panama 2003*	N/A	N/A	N/A	N/A	N/A	N/A	N/A

The share of households that hire in agricultural labour is more evenly distributed across countries, ranging from around 20 to 40 percent of agricultural households in most countries, with the exception of Ghana, where two-thirds of households hired in labour. As expected, the hiring in of agricultural labour increases with land size in most countries. This is particularly

true in the Latin American and Asian countries, while in the Eastern European countries agricultural labour markets are practically non existent.

5. Access to product markets

Moving from input to output markets, in Table 7 the share of agricultural households having made any sale of an agricultural (crop or livestock) product is presented both overall and across expenditure quintiles. The results show that in general about 70 percent of rural households participate in some sort of market for agricultural output. This varies though across countries, with lower rates for countries where non-agricultural activities may dominate. In many cases, particularly in Africa (Ghana, Madagascar and Nigeria) and Latin America (Ecuador, Guatemala and Panama) the poorest quintile tends to participate more in output markets suggesting that even the poor have access to output markets. In Asia and Eastern Europe, the poor seem to have less access except in Vietnam. Overall, the results do not show dramatic differences between the different categories. The results may be deceptive, however, since it may be the case that those with higher income have chosen not to produce for the market since there are better opportunities for them, such as non-agricultural activities, while those at the bottom of the distribution are excluded because of production or market constraints.

In Figure 7, we look more closely at the 'depth' of this participation, by plotting kernel densities of the share of output sold by agricultural households. We do this separately for crop and livestock sales. The focus is on agricultural households in the different land categories, including the top quintile of land owners the bottom quintile, and when relevant, the landless. These categories are included to get a sense of whether market integration is linked to land ownership. In general, a very mixed picture emerges.

Table 7. Output market participation, by expenditure quintile

	Percentage of HHs Selling Any Agricultural Production					
	Expenditure Quintiles					
	1	2	3	4	5	All
Africa						
Ghana 1998	81.0	76.7	73.5	66.1	55.6	70.6
Madagascar 1993	95.6	98.1	94.1	93.6	89.9	94.3
Malawi 2004	63.7	71.0	74.0	73.7	69.2	70.3
Nigeria 2004	73.5	72.3	71.4	70.7	62.9	70.2
Asia						
Bangladesh 2000	65.3	74.1	79.9	77.8	80.5	75.5
Indonesia 2000	N/A	N/A	N/A	N/A	N/A	N/A
Nepal 1996	59.4	69.7	71.9	76.1	68.5	69.1
Pakistan 2001	45.7	50.8	53.2	54.5	56.6	52.1
Vietnam 1998	93.3	93.7	92.4	92.8	87.0	91.8
Eastern Europe						
Albania 2005	74.0	79.1	80.1	81.2	78.2	78.5
Bulgaria 2001	11.4	30.9	32.4	32.6	34.3	28.3
Latin America						
Ecuador 1995	62.0	68.0	65.1	60.0	52.9	61.6
Guatemala 2000	58.6	67.3	58.5	53.5	44.8	56.5
Nicaragua 2001	79.5	82.2	84.3	77.5	77.1	80.1
Panama 2003	57.5	49.0	47.2	48.1	43.0	49.0

The peaks in the kernel distributions plotted in our graphs are rarely located towards the right-end of the horizontal axis, indicating that relatively few households sell the majority of their output. Exceptions are Malawi and the larger farmers in Vietnam, Ecuador and to some extent Guatemala. Another finding that emerges with a good deal of consistency from the graphs is how land ownership does have a significant association with market orientation. In most of the cases observed, the distribution of the top land quintile is shifted significantly to the right compared to the distribution of the smallest land owners and the landless. This association is however not as strong as one might have expected in some of the cases where it is observed, while in a few others (Albania, Malawi, Madagascar) hardly any association can be detected as the distributions track each other very closely[7].

In the case of livestock production on the other hand (Figure 8), the peaks in the distributions are more often than not located in the right-end half of the graphs, indicating a much greater degree of commercialization of livestock products when compared to crops. This is an expected results as livestock products are more difficult to store and are hence more often commercialised. In this respect it is very interesting to note how in a few countries (Malawi, Madagascar, Nicaragua) this relationship is either negative or weaker, which may be suggestive of livestock being owned more for savings purposes than for cash generation under certain circumstances. Also, unlike what we observed on crop sales, not much difference is

[7] When we plotted similar distributions by expenditure quintile (not reported) the results where broadly similar, but the difference across quintiles tended to be reduced even further.

found here with the shape of the distributions across land (or expenditure, not reported) quintiles, confirming the important role of livestock production as a cash earner even for the poorer strata of the population.

Figure 7. Distribution of share of crop production sold, by 1st and 5th land ownership quintiles and landless (kernel density)

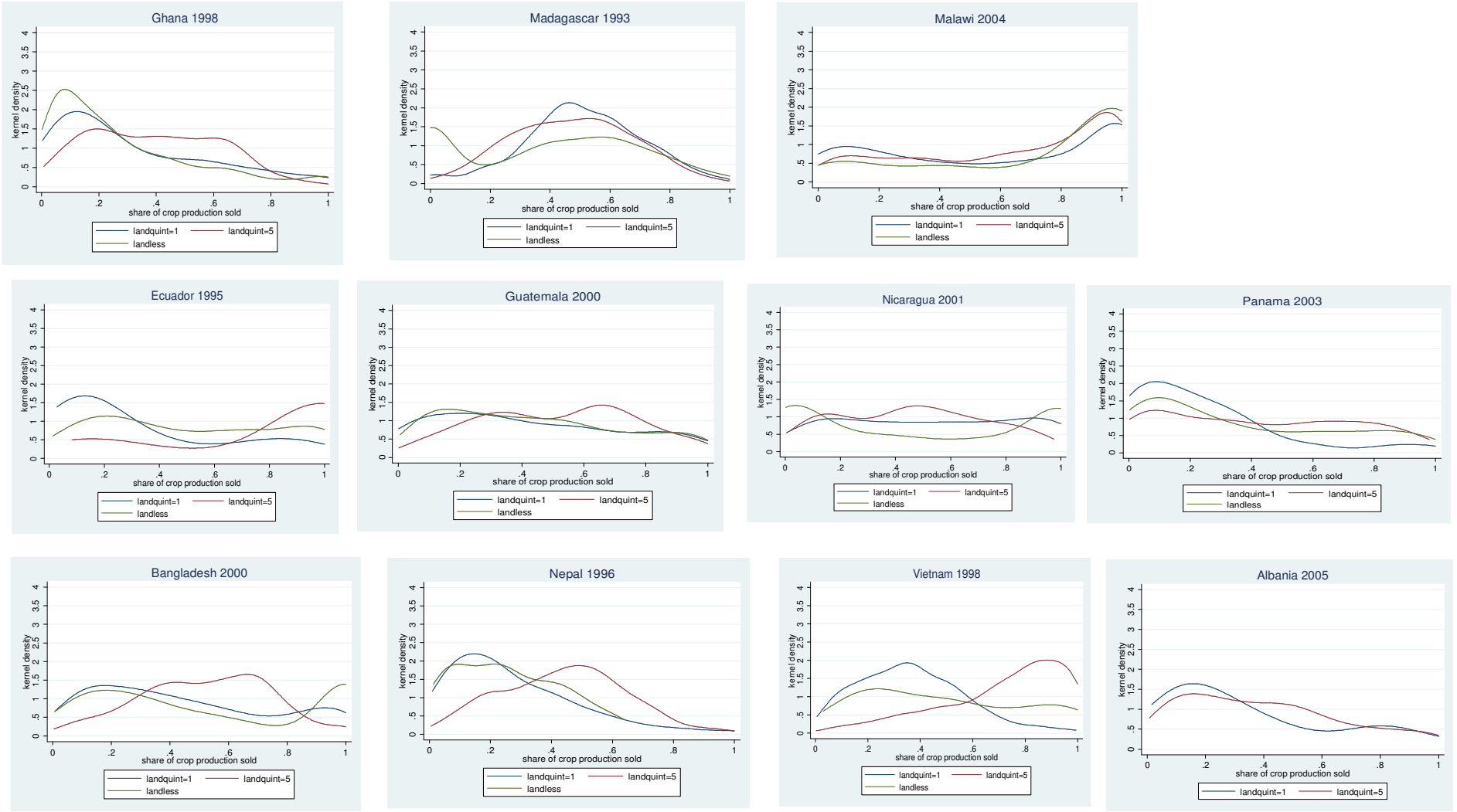
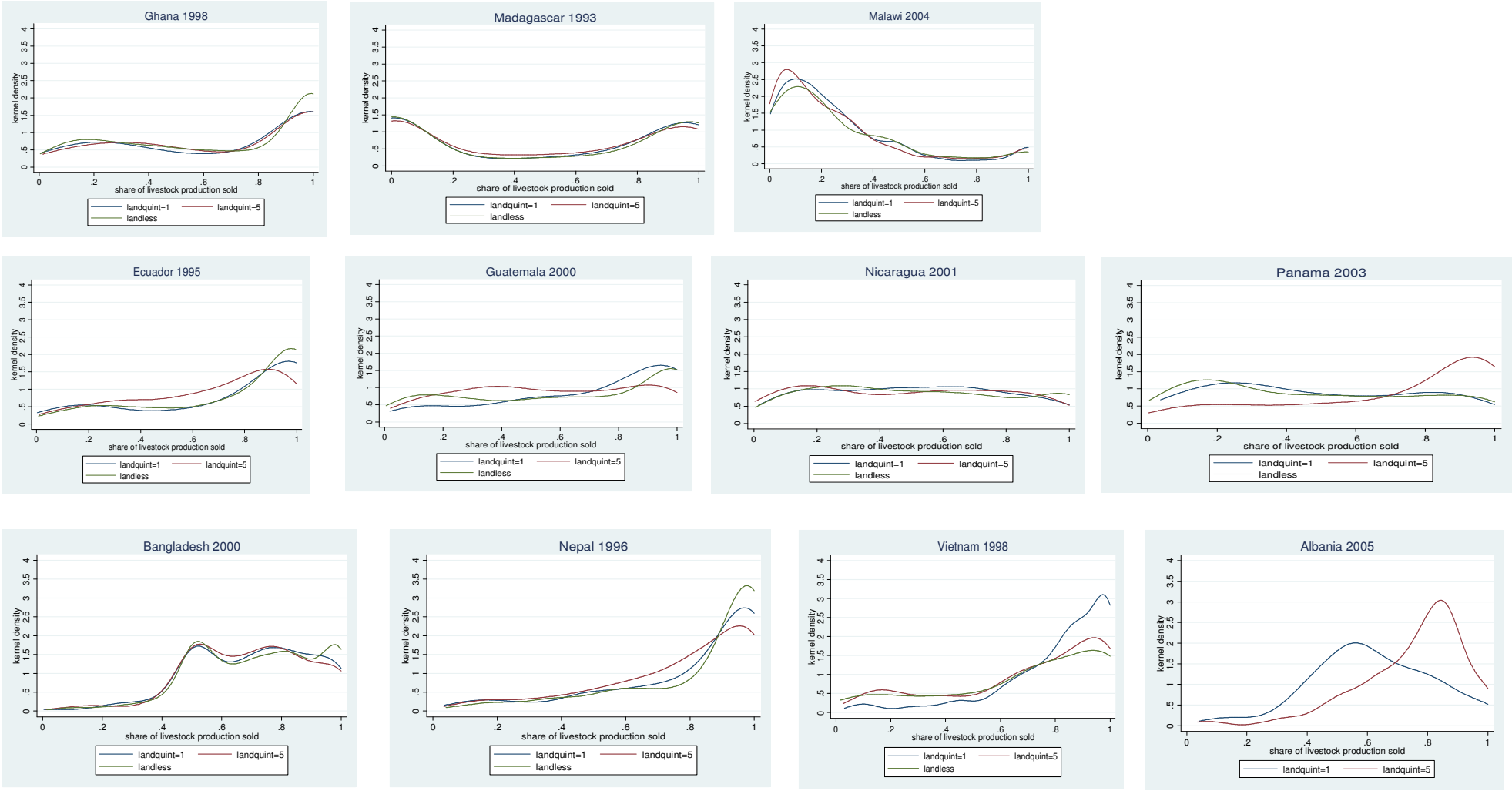


Figure 8. Distribution of share of livestock production sold, by 1st and 5th land ownership quintiles and landless (kernel density)



Looking at the concentration of volume of sales among households that participate in agricultural output markets, we find concentration among the largest sellers. Table 8 identifies the share of the total value of marketed agricultural production which corresponds to top quintiles of sellers, land-owners, and welfare (as measure by consumption expenditure). Seller quintiles are based on a ranking of agricultural households by value of production sold. With exception of Madagascar and Albania, 50 percent or more of the value of total marketed production corresponds to the top quintile of sellers. The value of sales are particularly concentrated among the Latin American countries, and Bulgaria has the highest concentration overall, at 94 percent.

Table 8. Concentration of value of marketed farm production, in top quintile of value, land and expenditure

	Top quintile of sellers	Top quintile of land	Top quintile of expenditure
Africa			
Ghana 1998	66.2	17.2	18.3
Madagascar 1993	44.4	18.8	22.9
Malawi 2004	66.5	38.0	25.4
Nigeria 2004	58.7	19.6	18.1
Asia			
Bangladesh 2000	61.1	28.6	26.1
Indonesia 2000	56.1	n/a	n/a
Nepal 1996	55.0	30.9	26.2
Pakistan 2001	49.9	22.1	22.4
Vietnam 1998	51.2	33.1	30.0
Eastern Europe			
Albania 2005	45.4	34.1	16.6
Bulgaria 2001	85.4	43.0	85.4
Latin America			
Ecuador 1995	93.5	53.0	35.3
Guatemala 2000	67.8	31.0	21.9
Nicaragua 2001	72.4	25.1	25.8
Panama 2003	82.1	44.4	37.7

The total value of sales is not concentrated by size of land holdings or welfare level, however. Here, the largest quintile of landholders accounts for between 17 and 53 percent of the total value of production sold, with the largest concentration in Ecuador. Similarly, the total value of sales is not concentrated by the wealth status of agricultural households. With the exception of Bulgaria, the wealthiest 20 percent of agricultural households accounts for about one fourth to one third of the value of marketed production. On the other hand, landless households (not reported) contribute an important share of the value of marketed (and overall) agricultural production in a number of countries, and in particular Ghana, Pakistan and Guatemala.

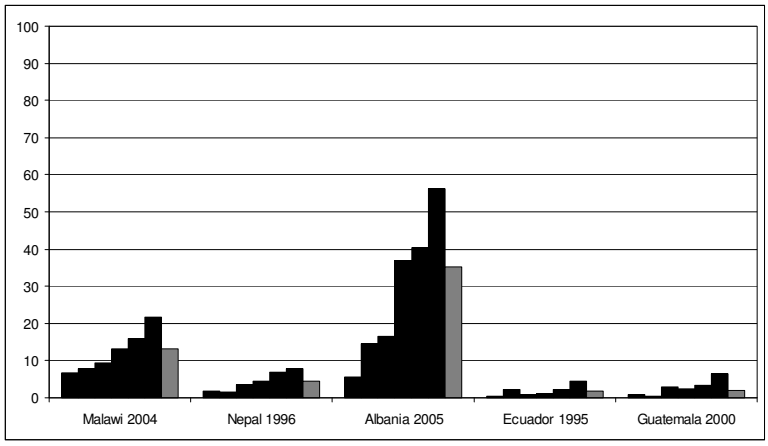
The value of total agricultural production (also not reported for reasons of space) is even less concentrated by land classes; in most countries the largest quintile of landholders accounts for between 20 and 29 percent of the total value of agricultural production. Conversely, again

with the exception of Bulgaria, the bottom 20 percent of households account for approximately 10 to 20 percent of the value of overall agricultural production. Clearly, the poor are responsible for an important part of agricultural production in these countries.

6. Agrarian support for producers

Given the pervasiveness of incomplete markets in rural areas, the ability of agricultural households to use assets efficiently is linked to the support available to them as producers. Two key types of support are examined in this section: technical assistance and credit. Historically, both have often been provided by governments through agricultural extension agencies and government supported agrarian development banks. More recently, there has been a withdrawal of the state from providing this type of support, particularly credit which along with being burdensome on budgets has also been plagued with inefficiency and management problems.

Figure 9. Percentage of agricultural households receiving technical assistance, by land category

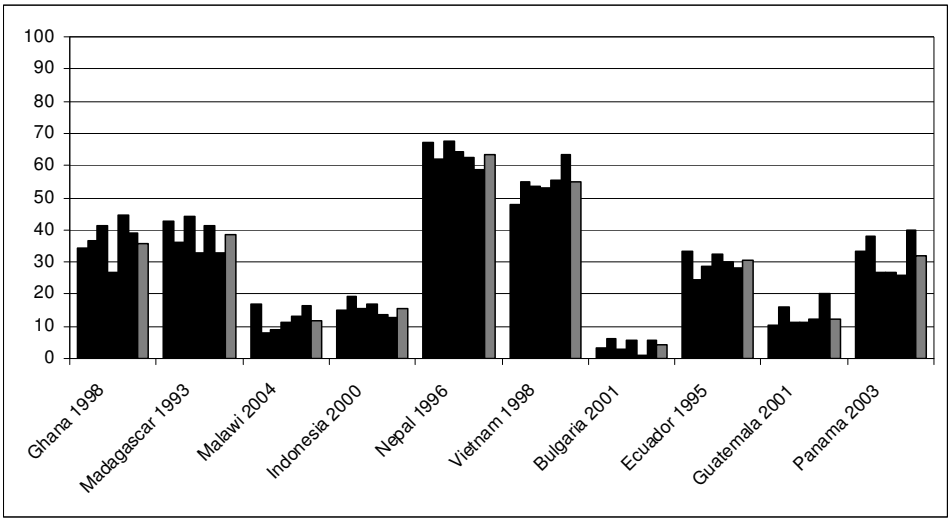


Note: Black bars represent the six land categories (from left to right landless and the five land quintiles) while the grey bar represents overall access.

Data on technical assistance are limited to only five countries, presented in Figure 9. The dark bars represent the land categories noted in the previous section and the grey bar overall access. In general, technical assistance levels are low with no more than a third of households receiving assistance, and for Nepal, Guatemala and Ecuador less than five percent of households received technical assistance. The probability of receiving technical assistance is significantly higher among large landholders, in all countries. The results, while limited to five countries, suggest a critical lack of technical assistance, and that in particular public and private providers of technical assistance are failing to cater to poorer, smaller farmers.

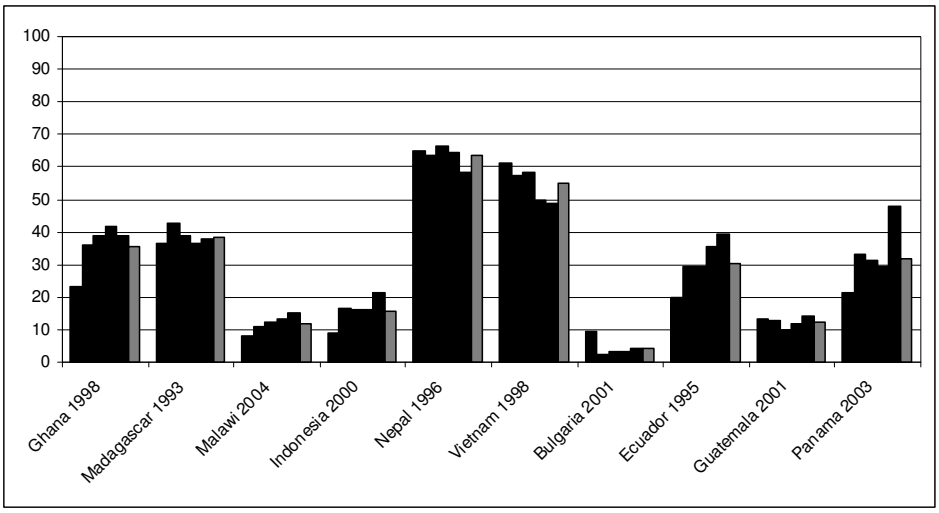
Ideally, to get a sense of credit access, data on whether households demanded credit, or an additional amount of credit under the same terms and conditions, would be used. Unfortunately, only in a small subset of surveys are such detailed questions available. For reasons of comparability, therefore, the simple question of whether households receive credit from any source is used in this analysis. This at least provides a sense of the variation in access across countries and land/expenditure categories. Both land and expenditure categories are considered since credit can be considered a function of each. The use of credit (including loans from family members and relatives), is on average no more than 40 percent of agricultural households and in most countries no more than about one in ten agricultural households have access to credit (Figures 10 and 11). In several countries the use of credit appears to be more strongly related to the income level than to land ownership.

Figure 10. Percentage of agricultural households using credit, by land category



Note: Black bars represent the six land categories (from left to right landless and the five land quintiles) while the grey bar represents overall access.

Figure 11. Percentage of agricultural households using credit, by expenditure quintile



Note: Black bars represent the five expenditure quintiles (poorest to the left, richest to the right) while the grey bar represents overall access.

7. Weaving the threads: How does 'success' in farming relate to access to inputs, assets and services?

In this section we attempt to weave together the threads we have laid so far by investigating the hypothesis that success in farming is in fact constrained by the lack of access to basic assets, inputs and services. The idea is that if farmers are not in a position to exploit the opportunities offered by agricultural markets and remain trapped in a subsistence strategy, it is highly unlikely that for them agriculture will become a workable pathway out of poverty.

To investigate this proposition we look at the extent to which, controlling for a vector of household, individual, and geographical characteristics, access to land, basic agricultural inputs, and credit and technical assistance services are still associated with a lower ability to participate in the market. We do this by estimating two models that have as dependent variables respectively (a) the share of crop production sold, and (b) the log of the value of the crop production sold (in local currency). The right-hand side of the models is otherwise identical and so is the estimation procedure.

The theoretical motivation and model for this analysis follows the agricultural output market access literature (Goetz 1992; Key et al., 2000; Bellemare and Barrett., 2006; Boughton et al., 2006). We assume that the decisions of whether to sell and how much to sell are sequential, not simultaneous. Our model is specified as a Heckman sample selection model, estimated by

using full maximum likelihood[8]. Our model includes four sets of explanatory variables: a vector of household demographic characteristics, one of household assets (education, labour, land, other non-agricultural physical assets), one of access to agricultural inputs and services (fertilisers, pesticides, irrigation, mechanisation and a principal component index measuring access to public infrastructure), and finally a set of country-specific geographic dummies.

Table 9. Number of country share and value regressions in which a given independent variable was positive/negative and statistically significant

	Log value of crop production sold		Share of crop production sold	
	Log Value	Selection	Shares	Selection
Fertilizers	4/2	12/0	3/3	11/2
	(12)	*(12)*	*(12)*	*(13)*
Pesticides	6/0	10/0	4/0	10/0
	(11)	*(11)*	*(11)*	*(11)*
Mechanization	9/0	10/0	6/1	9/0
	(11)	*(11)*	*(11)*	*(11)*
Irrigation	1/0	2/1	0/0	2/0
	(5)	*(5)*	*(5)*	*(5)*
Technical assistance	0/0	1/0	0/0	1/0
	(2)	*(2)*	*(2)*	*(2)*
Hh Labour	10/0	5/0	0/5	7/0
	(12)	(12)	(12)	(12)
Land	10/0	8/0	7/1	7/0
	(12)	(12)	(12)	(12)
Non-ag wealth	7/2	2/5	4/1	1/6
	(12)	(12)	(11)	(12)

Note: The table reports the number of cases in which the coefficient on the given variable was positive and significant / Negative & significant (out of # of countries analyzed).

Exclusion restriction variables in our selection equations are, following Boughton et al. (2006), variables that may affect the household reliance on agricultural sales as a source of income, as these might affect farmers perceptions of the risks associated to participating in the agricultural markets. In particular these variables are a migration network dummy (identifying whether the household head has migrated to the current residence), variables on participation in key non-farming activities (non-agricultural self-employment, and agricultural and non-agricultural wage), and a religion dummy (identifying whether the household head belongs to the main religious group in the country). We also include a distance variable in the first stage to capture fixed transaction costs.

As each model is estimated separately on each country dataset, it would be too cumbersome to report the full results, and we therefore only present a synthesis of the results in Table 9. Results overwhelmingly support the idea that access to basic agricultural inputs and key

[8] Exceptions are the Albania and Bulgaria share regressions and the Madagascar log value regression, which are estimated using the two-step Heckman since the ML procedure would not converge.

agricultural assets is strongly associated to farmers' ability to successfully engage in agricultural output markets. Fertilizers, pesticides, mechanization and irrigation use are all positively associated with greater participation in agricultural output markets, and greater share and value of agricultural sales.

Results are somewhat stronger in the participation equation, but they are similarly robust in the second stage equation, particularly in the log value regressions. In the latter, pesticide use is significantly positively associated with the probability ('intensity') of the participation in agricultural output markets in ten (six) study countries. The same holds for the use of mechanized agricultural implements in nine (ten) countries.

These findings are clearly not unexpected, but taken together with the very low level of access to assets, inputs and services documented in the first part of the paper, they raise serious issues for concern in areas where government policy and other development efforts can have an important role. Anti-poverty strategies, policies and programmes that rely on smallholder agriculture as an engine of growth and a motor of poverty reduction should not ignore this basic message if they are to have a chance at succeeding.

8. Conclusions

This paper set out to identify the asset position of rural households, to document access to agrarian institutions and to characterise heterogeneity in access to basic assets and agrarian institutions in a sample of developing and transition countries in four continents. From the results of the analysis a clear picture emerges of a rural space in which small land and livestock holders lack access to key assets, inputs, markets and basic services—the very instruments that are necessary for rural households engaged in farming to achieve an agricultural-led path out of poverty. The overall results also point to a large degree of heterogeneity both within and across countries in terms of access by rural households to essential assets and services.

The results in this paper complement the findings of a study which uses the same dataset to look at sources of rural income. In that study one main finding was that poorer rural households lack access to those sources of non-farm income which would enable them to escape poverty. In this paper the focus has been explicitly on assessing the extent to which rural households have access to the means (assets, inputs, services) to engage successfully in agricultural production.

Cross-country analyses of the type carried out in this paper are not well suited for generating detailed policy prescriptions as these require digging deeper into the causal links and into country-specific determinants of the observed patterns. Some key observations of general relevance can however be distilled. The main policy message that emerges from this broad, evidence-based, overview of access to agricultural assets and inputs in the developing world is that much of the agenda the agricultural economics profession and policy makers dealing with agricultural policy issues in developing countries in the last few decades is not outdated and requires renewed emphasis.

While farming continues to be the backbone of much of the rural economy, most farming households in the developing world still have minimal access to basic agrarian services and institutions. Agricultural households in the developing countries covered by the data have limited access to most modern productive inputs and to technical assistance and credit, all key features of a functioning agricultural economy. Most agricultural households lack access to inputs which require monetary payment, such as pesticides, mechanization and hired labour. Access levels are generally lowest in Africa, and somewhat better in Asia and Africa, but with patterns that vary by type of farmer, country and input – so that far-reaching generalizations are not possible.

Land sizes are extremely small with a large majority of households owning less than one hectare of land. Both land and livestock assets are highly concentrated in a majority of countries. Further, for those households involved in agriculture, alternative forms of access other than ownership (such as rentals or sharecropping) play an important role in most places in facilitating access by poorer households to land. Policies directed at reforming land tenure rights should exercise outmost care at identifying the local specificity of tenure arrangements, as traditional tenure systems, renting in and sharecropping of land are a particularly widespread form of access for the poorer, smaller farmers and the landless.

Given the pervasiveness of agriculture as a livelihood strategy (especially for the poor) in rural areas, it is hard to see how poorer households can get onto an agricultural based path out of poverty when their conditions regarding access to inputs, services and institutions are those described by our data.

A majority of agricultural households do participate in agricultural output markets, with African levels comparable or higher than those of other regions and no clear-cut pattern in the relationship between participation in agricultural sales and expenditure levels. Many households that do participate in markets, though, only sell a small proportion of their output.

As we have shown, however, this behaviour varies markedly across countries and is not as directly related as one might have expected to land ownership and overall welfare, prompting the need for a more in-depth analysis of what drives market participation.

We have started digging somewhat into this question, by looking at how market orientation is associated with greater access to agricultural specific inputs and services, after controlling for land ownership and access to non-agricultural wealth. Although it is difficult to make definite causal statements based on this analysis, we do think that our results are indeed suggestive of the fact that limited access to assets, basic agricultural inputs and services is still a major constraining factor undermining the potential of smallholders to successfully engage in agricultural output markets.

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