Smallholder Farming In Difficult Circumstances: Policy Issues for Africa

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1. Introduction

In Sub-Saharan Africa, "difficult circumstances" would apply to at least two-thirds of the small farm population. Most small farmers in Africa directly or indirectly suffer the effects of civil disruptions and political turmoil, HIV/AIDS, and weak support from their governments compared to almost all other parts of the world with regard to funding for agricultural science and technology, extension support, health and education. Many small African farmers find themselves on the low end of a tilted global agricultural trading system. Their future is further jeopardized by declining international development assistance. The increasingly privatized and effective demand-driven international agricultural research systems are largely being influenced by the priorities of large farms in high-income countries, putting greater distance between farmers in high- and low-income countries in terms of access to productive new technologies.

To be sure, there are relative differences in the severity of the difficulties faced by African smallholders, and it would be possible to focus research attention on the bottom 25% of farms defined by certain criteria as being in relatively difficult circumstances. However, we choose not to do this, first because most small farms in Sub-Saharan Africa are in difficult circumstances compared to farms in almost all other areas of the world, and second, because the broad development agenda for the bottom 25% of small farms in Africa is largely the same as those for the bottom two-thirds.

This paper identifies major trends and near-term processes affecting the future of the small farm in the region, identifies policy responses and public investment strategies by African governments, governments of high-income countries, and multilateral donors that are likely to be required to give the small farm the chance to be viable in an increasingly globalized world.

The basic problem is that the small farm in Africa is becoming increasingly unviable as a sustainable economic and social unit, and unless government policy is changed radically, the world will see economic and social crises in Sub-Saharan Africa with increasing frequency and severity. Many of these crises are likely to have global repercussions, which is why, even from an insular and self-interested perspective, groups in the rest of the world would find it in their interests to pay attention to the challenges facing the small farmer in Africa and other low-income regions of the world. Our main premise is that without real changes in the implementation of development assistance, world trade protocols, and the allocation of resources by governments, most of the small farms in Africa will face a very uncertain and untenable future, involving major dislocations, migration, growing problems of urbanization, and increasingly chronic crises of hunger and poverty. Even with positive changes in these key policy areas, the number of small farms in Africa will nevertheless shrink through structural

transformation processes driven by agricultural productivity growth, but with much less severe dislocations and crises in the process.

The main messages of this paper are that (1) the challenges facing small farms in difficult circumstances is largely the same set of challenges involved in achieving broad-based agricultural growth and rural development; (2) the keys to reviving the health of the small farm sector in Africa involve the supportive decisions of national and international actors – it is not simply a matter of local communities organizing themselves effectively, because they lack the resources to counteract the effects of much larger forces and decisions under national and international jurisdiction; (3) over the long run, the most optimistic scenario for the small farm sector is likely to involve enabling most smallholder households to exist farming by being 'pulled" into other sectors of the economy through rising demand for non-farm jobs that, as history has shown, generally starts with sustained agricultural productivity growth; and (4) a meaningful agricultural growth strategy aimed to support the small farm, including those in the most difficult circumstances, will need to match recent promises of support for "pro-poor" agricultural growth with necessary financial support and policy attention. Doing so will be crucial to generating the economy-wide benefits to the poor associated with inter-sectoral multiplier effects associated with structural transformation.

To make our points, we occasionally draw on recent nationwide surveys of small-scale farm households in Kenya, Zambia, Malawi, and Mozambique. The details of the data sets are contained in Appendix 1. Other arguments are drawn not on the basis of empirical or historical evidence but rather on assumptions of future trends and conceptual models. Section 2 deals with major trends affecting the viability of the small farm, primarily in eastern and southern Africa: inequitable land distribution, stagnant food crop productivity, the concentration of marketed surplus from the small farm sector, inequitable returns to non-farm activities, civil disruptions, HIV/AIDS, farm supports in high-income countries and global agricultural trade policies, and declining donor assistance for the small farm. Section 3 deals in broad terms with needed changes in institutions and organizations, and policies to promote investment and productivity growth in the small farm sector.

2. Major Trends Affecting the Viability of the Small Farm in Eastern and Southern Africa and their Implications

2.1 Decline in land/labor ratios and inequitable land distribution

Relative to other areas of the developing world, Africa has been seen as a continent of ample land and scarce labor. While this was true decades ago and may still apply to some areas where smallholders leave arable land uncultivated due to lack of labor or draught power, it no longer applies to much of southern and eastern Africa. One of the most important trends in African agriculture is a steady decline in the land-to-person ratio. Between 1960 and 2000, according to FAO data, the amount of arable land under cultivation (including permanent crops) has risen marginally, but the population of households engaged in agriculture has tripled. This has caused a steady decline in the ratio of arable land to agricultural population (Table 1). In Kenya, Ethiopia, and Zambia, for example, this ratio is about half as large as it was in the 1960s.

Table 1. Ratio of Cultivated Land to Agricultural Population (10-year means)

	1960-69	1970-79	1980-89	1990-99
Ethiopia	0.508	0.450	0.363	0.252
Kenya	0.459	0.350	0.280	0.229
Mozambique	0.389	0.367	0.298	0.249
Rwanda	0.215	0.211	0.197	0.161
Zambia	1.367	1.073	0.896	0.779
Zimbabwe	0.726	0.664	0.583	0.525

Note: Land to person ratio = (land cultivated to annual and permanent crops) / (population in agriculture).
Source: FAOStat website:
Source: FAO Stat database: http://faostat.fao.org/faostat/collections?version=ext&hasbulk=0&subset=agriculture

In addition, the distribution of available land is highly inequitable. It is well-known that the colonial legacy has left much of Africa with severe land inequalities between smallholder, large-scale, and state farms. Redressing inequalities between these farm groupings is likely to be an important element of an effective rural poverty reduction strategy in countries such as Zimbabwe and Kenya. Yet, perhaps less well-recognized is that there are major disparities in land distribution within the small farm sector itself. In eastern and southern Africa, the smallholder farm sector is typically characterized as small but relatively "unimodal" and equitably distributed landholdings situated within a "bi-modal" distribution of land between large-scale and small-scale farming sectors. By contrast, Jayne et al (2003) found consistently large disparities in land distribution within the small farm sector using national household survey data in Ethiopia, Kenya, Malawi, Mozambique, Rwanda, and Zambia. While average land holdings in the small farm sector range from between 2.5 and 3.0 hectares in Kenya and Zambia to around one hectare in Rwanda and Ethiopia, mean farm size figures mask great variations.

For example, after ranking all smallholders by household per capita land size, and dividing them into four equal quartiles, households in the highest per capita land quartile controlled between five to 15 times more land than households in the lowest quartile (Table 2). In Kenya, for example, mean farm size for the top and bottom land quartiles were 6.69 and 0.58 hectares, respectively, including rented land. The range of computed Gini coefficients of rural household land per capita (0.50 to 0.56) from these surveys show land disparities within the smallholder sectors of these countries that are comparable to or higher than those estimated for much of Asia during the 1960s and 1970s (Haggblade and Hazell 1988). If these countries' large-scale and/or state farming sectors were included, the inequality of landholdings would rise even further.

An additional problem is the extremely low absolute level of landholding/capita among some households. In each country, the bottom 15-20 percent of small-scale farm households are approaching landlessness, controlling less than 0.5 hectares. In Ethiopia and Rwanda, the bottom land quartile controlled less than 0.20 and 0.32 hectares per capita. In Malawi, 80 percent of all smallholder households possess less than one hectare of land (Chirwa, 2005).

Table 2. Mean Household Attributes by Landholding Size Per Capita Quartile, Various Countries

| Country (survey year)	Household Attribute	Total	Quartiles of Per Capita Farm Size			
			1	2	3	4
Kenya	Landholding size (ha)	1.77	0.64	1.18	1.84	3.45
2000	Gross value of crop sales (2000 US$ per hh)	1,067.0	484.7	750.5	1,419.8	1,611.7
	Household income (2000 US$ per capita)	553.9	272.6	379.4	568.2	998.4
	Off-farm income share (%)	29.5	35.4	28.6	28.7	25.6
Ethiopia	Landholding size (ha)	1.17	0.20	0.67	1.15	2.58
1996	Gross value of crop sales (1996 US$)	145.8	33.7	82.3	120.6	265.2
	Household income (1996 US$ per capita)	71.6	53.1	52.1	88.3	91.0
	Off-farm income share (%)	8.1	13.7	9.0	5.4	4.6
Rwanda[a]	Landholding size (ha)	.94	0.32	0.63	1.00	1.82
2001	Gross value of crop sales (1991 US$ per hh)	68.0	34.1	45.1	72.4	169.3
	Household income (1991 US$ per capita)	78.7	54.5	59.4	79.3	139.7
	Off-farm income share (%)	24.8	34.5	24.4	22.2	18.2
Mozambique	Landholding size (ha)	1.66	0.53	1.20	1.76	3.14
2002	Gross value of crop sales (2002 US$ per hh)	26.7	9.4	20.9	27.3	49.1
	Household income (2002 US$ per capita)	59.5	45.7	46.4	55.4	90.6
	Off-farm income share (%)	27.3	34.3	26.6	24.9	23.5
Zambia	Landholding size (ha)	2.73	0.74	1.60	2.75	5.81
2000	Gross value of crop sales (2000 US$ per hh)	72.2	32.7	59.2	83.6	113.4
	Per capita income (2000 US$ per capita)	122.3	107.5	107.0	115.6	159.2
	Off-farm income share (%)	28.4	28.5	39.7	27.0	25.0

Source: compiled from various tables presented in Jayne et al., 2003 and authors' estimates.
Notes: Samples include only "agricultural households" defined as households growing some crops or raising animals during the survey year. All numbers are weighted except Kenya. Income figures include gross income derived from crop production on rented land. [a] For Rwanda: data is not available for land loaned out, only data on rented land is included.

Both the inequality of land access and the low absolute levels of land/capita of some households are problematic for poverty reduction and growth for several reasons. First, there is a strong relationship between access to land and household income in southern and eastern Africa, particularly for farm sizes below 1 ha/capita (Jayne et al, 2003). Mean total household incomes of the top land quartile are double those of the bottom quartile (Table 2). This relationship appears to be driven by limited access of land-poor households to lucrative non-farm income opportunities and higher-value crop or livestock markets, as is discussed further below. Second, it is generally accepted that "pro-poor" agricultural growth is strongly associated with equitable asset distribution (Datt and Ravallion, 2004; Gugerty and Timmer, 2000), yet surprisingly little attention has been devoted to considering the implications of land inequality in poverty reduction strategies.

2.2   Stagnant Productivity of Food Crops

Over the last 40 years, food crop productivity has risen throughout the rest of the world yet remained stagnant in Africa (Figure 1). Explanations for this are many, though usually center on the limited use of irrigation, fertilizer, and improved cultivars – the absence of an African Green Revolution.

Figure 1. Annual cereal yields by region, 1961-2000
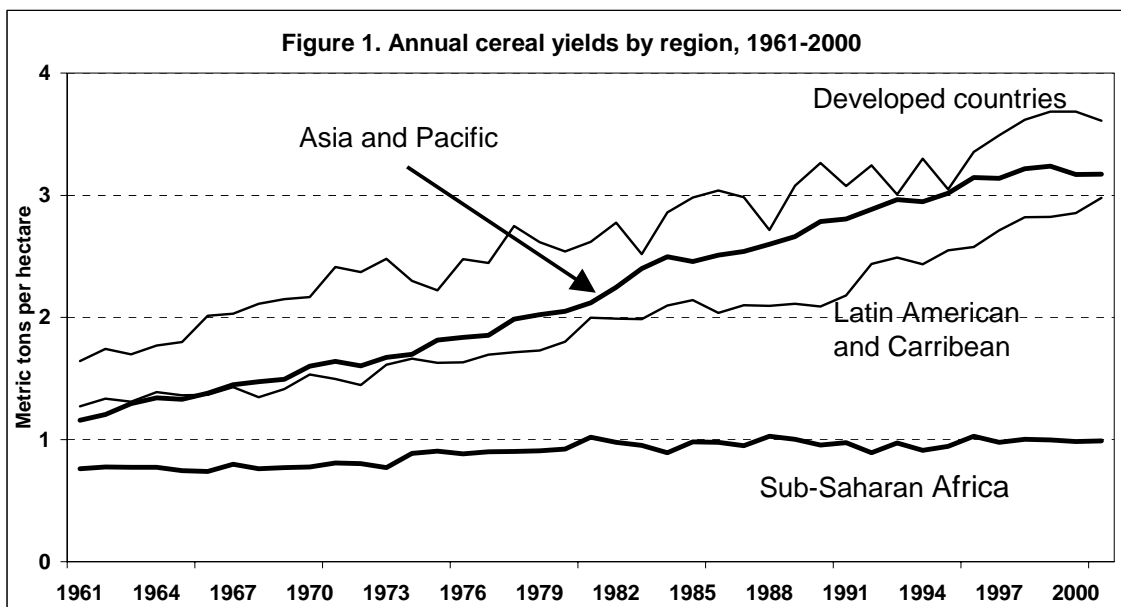
Source: FAO Stat database: http://faostat.fao.org/faostat/collections?version=ext&hasbulk=0&subset=agriculture

Agricultural productivity growth is centrally important for improved living standards in both rural and urban areas. Currently, land pressures and low productivity are combining to generate a "push" form of labor migration out of rural areas (rather than the "pull" effect of structural transformation), contributing to the swelling of Africa's cities and social problems associated with this. The view that many rural areas have effectively reached the limits of their carrying capacity are consistent with Tiffen's (2004) observation that rural population growth is less than one percent per year while urban population continues to grow rapidly in most of Africa.

Increases in food crop productivity will likely remain a key driver of rural nonfarm activity in Africa, and not vice-versa, for several reasons. First, African spending patterns support far less rural nonfarm activity than do those in Asia, as African consumers spend far more of their average and marginal income on rurally produced foods, a result due to low income levels as well as lower population and road density (Haggblade and Hazell, 1989). Second, in countries such as Mozambique and Zambia, nearly 2/3rds of rural households derive most of their total income from retained food crops. Yet, even considering the predominance of food self-provision in these households' income activities, many households are still net buyers of major staple crops such as maize. Widespread productivity increases in food crops would therefore release labor and capital from food crop production – for large numbers of households, especially the poorest -- making them available for the production of higher-value crops and non-farm activities such as manufacturing and services. This is likely to not only increase the food consumption of poor households but, as incomes grow, should also eventually increase the portion of household

disposable cash income that is spent on non-staple foods and consumer goods, as per Engel's law. Finally, history suggests the necessity of productivity increases in agriculture: except in the cases of a handful of city-states, there are virtually no examples of mass poverty reduction since 1700 that did not start with sharp rises in employment and self-employment income due to higher productivity in small family farms (Lipton, 2005).

2.3 Concentration of Farm Sales and Commercialization

One potential pathway out of poverty for smallholders with limited landholding is to earn greater returns per unit of land by diversifying into higher-value crops and animal products. There is some evidence that this is occurring: cross-sectional community fixed-effects models from Kenya indicate that horticulture's share of crop revenue and area is significantly inversely related to farm size (Jayne et al., 2005). However, these opportunities are impeded by measures that raise the costs and/or risks of household staple food acquisition through markets (in addition to input and output marketing constraints common to small farmers). The higher the price of food, and the greater the price variability during the lean season, the greater the household incentives revert to self-provisioning of food staples (Fafchamps, 1992; Jayne, 1994; Omamo, 1998). Thus, diversification into higher-value crops is most likely to occur in densely populated rural areas and peri-urban areas, where high population pressure results in low land/labor ratios, food markets are more likely integrated with nearby urban markets, and demand for horticultural crops and animal products is high.

Crop sales income remains strongly correlated with landholding size (Table 2). The gross revenue generated from crop sales among households in the top farm size quartile exceeded that of the bottom land size quartile by 8 to 11 times, except in the case of Rwanda, where the difference was only 5 times as great (Table 2).[1]

In eastern and southern Africa, maize is not only a major staple in many regions but also a cash crop. Thus, we might expect smallholders to more readily commercialize a crop which is both consumed and marketed. Yet, the evidence suggests that the combination of inequitable land access and large variations in crop productivity across households and regions contributes to considerable heterogeneity with respect to smallholders' position in staple food markets. For example, nationally representative household surveys in eastern and southern Africa where white maize is the staple food indicate that small-scale farm households generally fall into one of the following four categories with respect to the grain market (Table 3):

1. sellers of staple grains: Roughly 20 to 35 percent of the small farms in the region sell maize, the main staple, in a given year. This figure rises in good harvest years and falls in a drought year. However, there are two sub-groups within this category:

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[1] Despite these disparities in land allocation within the small farm sector in these countries, one could find this farm structure un-alarming in comparison with some Asian countries. For example, the mean farm size for 80 percent of the landholdings in South Asia (Pakistan, India, and Bangladesh) is 0.6 hectares. However, the greater scope for off-farm employment, coupled with the higher productivity of farming arising from more effective water control, the use of purchased inputs, and the greater scope for multiple croppings per year in much of Asia warrant caution in comparing farm sizes with those in Africa, or even within African countries.

- a very small group of relatively large and well-equipped smallholder farmers with 4 to 20 hectares of land, usually in the most favorable agro-ecological areas (about 1 to 4 percent of the total rural farm population), accounting for 50% of the marketed maize output from the smallholder sector.
- a much larger group of smallholder farms (20 to 30 percent of the total rural farm population) selling much smaller quantities of grain. These households tend to be slightly better off than households that buy grain, but the differences are not very great in absolute terms.

2. buyers of staple grains: Roughly 50-70 percent of the rural population consistently buys maize, with this figure higher in drought years and lower in good production years. These households are generally poorer and have smaller farm sizes and asset holdings than the median rural household. They are directly hurt by higher grain prices.

3. households buying and selling grain within the same year: In all of the nationwide surveys reported in Annex 1, relatively few households both buy and sell maize.[2] Only about 5 to 15 percent of the rural population buys and sells maize in the same year. These include relatively large farms that sell grain and buy back lesser amounts of processed meal, and relatively poor households that make distress sales of grain after harvest only to buy back later in the season.

Table 3. Distribution of Small-scale Farm Population According to their Position in the Staple Grain Market, Selected Countries.

Household category with respect to main staple grain:	Zambia (maize)	Mozambique (maize)	Kenya (maize)	Malawi (maize)	Ethiopia (maize and teff)
	---------------------------- % of rural farm population -------------------------				
Sellers only:	19	13	18	5	13
top 50% of total sales[*]	2	2	2	1	2
bottom 50% of total sales[**]	17	11	16	4	11
Buyers only	33	51	55	na	60
Buy and sell (net buyers)	3	12[***]	7	na	13
Buy and sell (net sellers)	6		12	na	12
Neither buy nor sell	39	24	8	na	2
	100%	100%	100%	100%	100%

Notes: [*] after ranking all households by quantity sold, this row shows the percentage of households in the smallholder sector accounting for the first 50% of total maize sale; [**]percentage of households accounting for the other 50% of total maize sales. [***]The survey in Mozambique was not able to ascertain quantities of maize purchased therefore whether these households are net buyers or net sellers in unknown.
Sources: see Jayne et al., 2005a.

4. households neither buying nor selling maize: these households make up a small proportion of the rural population in areas where maize is the dominant staple crop. However, in parts of

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[2] This empirical regularity contrasts with the common notion that, because of lack of credit, farmers typically sell at harvest at low prices and buy back latter at higher prices.

northern Zambia and Mozambique, cassava is the main staple. Because of this, a sizable fraction of the rural population at the national level is autarkic with respect to maize.

In addition, sales income is highly concentrated among a relatively small number of large and commercialized farmers in the smallholder sector -- one or two percent of smallholders account for 50% of the overall marketed maize surplus from the smallholder sector (Jayne et al, 2005a). These farm households appear to enjoy substantially better living standards, in terms of asset holdings and total income, than the rest of the rural population: roughly 2 to 5 times as much land and productive assets as the non-selling households; 2 to 7 times as much total household income; and 3 to 8 times more gross revenue from the sale of all crops.

The empirical evidence presented in this section hold several important policy implications. First, farm price supports or stabilization policies that involve altering mean price levels over time (as they usually do), can have unanticipated income distributional effects that run counter to stated poverty alleviation goals. To the extent that the poor are net purchasers of staples such as maize, wheat, and rice, they are directly hurt by policies that raise prices of these commodities.[3] Moreover, the benefits of mean-raising food price policies are likely to be extremely concentrated. Mean-neutral forms of price stabilization would most likely avoid these adverse distributional effects, and might also encourage diversification toward higher-valued crops by maize purchasing households (Fafchamps, 1992). Finally, strategies to link African farmers to markets must take account of the inequality in productive assets and low crop productivity, which contribute to highly concentrated patterns of agricultural surplus generation within the smallholder sector, and to the constraints on household diversification into higher-value crop production imposed by food market instability.

2.4   High return non-farm activities limited among households with minimal land and education

Another potential pathway out of poverty for land-poor households is non-farm income. Barrett *et al* (2001) find a positive relationship between nonfarm income and household welfare indicators across much of rural Africa. However, they also find that because of substantial entry or mobility barriers to high return niches within the rural nonfarm economy, only a small proportion of rural households that are relatively well-endowed in land or human capital have access to nonfarm employment that earns a reasonable return to labor. This implies a vicious and self-reinforcing circle of unequal distribution of land and nonfarm earnings, thereby causing the nonfarm sector to have regressive effects on income distribution in rural Africa. Over time, this can lead to an increasingly skewed distribution of land and other assets (Barrett al, 2001).

Consistent with Barrett et al, we find that while non-farm shares of total income are high among land-poor households, absolute levels of nonfarm income are typically not high enough for these households to compensate for low land endowments and earn total incomes greater than the sample median (Table 2). Only for households that have highly educated members is small farm size not inversely correlated with household income (Table 4). Note that for households in the

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[3] Of course, a general equilibrium approach, taking into account indirect effects on welfare through the labor market, would need to be undertaken before the welfare effects of mean-altering price policies could be fully understood.

bottom land tercile, there are relatively few households with highly-educated heads, but their income levels are nearly as high as households in the top land tercile. For land-constrained farm households, education appears to offer a pathway out of poverty, but human capital accumulation is largely a long-term and intergenerational process. Moreover, the payoffs to education will depend on non-farm job opportunities, which is ultimately dependent on broad-based agricultural growth (*i.e.,* Johnston-Mellor transformation processes).

Education, which played an important role in Asia by allowing households to exit agriculture into more lucrative off-farm jobs, is relatively low in most areas of rural Africa by world standards. Worldwide, about 113 million children were out of school in 1998, and of these, 40 percent were in Sub-Saharan Africa. At 41 percent, the illiteracy rate in the region is still high compared to the rest of the world, but fortunately it is at its lowest point ever. Of particular significance is the advance being made in girls' education, with the percentage of illiterate women slowly declining from 66 percent in 1985 to 49 percent in 1998 (World Bank 2001).

Investments in rural education will contribute to agricultural transformation and growth in a variety of ways—through the adoption of new technology, through greater public empowerment and recognition of their interests in a complex world, through the ability of citizens to articulate their interests and demand greater accountability from the political process, and through the direct contribution to labor productivity that results from public and private tasks being performed by people with higher levels of training and education. Indeed, Africa's future economic growth will depend less on exploiting its natural resources, which are subject to long-run primary commodity price declines, and more on its labor skills and its ability to integrate itself into the global economy.

But investing in education is expensive; so is investing in health and agriculture. These trade-offs are simply too severe for governments to handle on their own with their limited budgets. A serious commitment to development will require a greater response from donor countries.

Table 4. Mean Household Attributes by Landholding Size by Level of Education, Kenya (pooled 1996/97 and 1999/00), Mozambique (2001/02) and Zambia (2000/01).

		Landholding Tercile								
		1 - lowest			2 - middle			3 - highest		
	Total	Education level terciles			Education level terciles			Education level terciles		
	Sample	1	2	3	1	2	3	1	2	3
No. of observations		-- mean value --								
Kenya	1404	176	159	133	120	149	200	127	148	192
Mozambique	4515	342	573	446	422	653	432	570	622	455
Zambia	6921	914	728	619	693	749	681	667	902	968
Landholding size (ha)[1]										
Kenya	1.77	0.58	0.54	0.65	1.36	1.39	1.34	3.55	3.37	3.27
Mozambique	1.59	0.50	0.51	0.49	1.25	1.25	1.26	2.75	3.13	3.10
Zambia	2.73	0.69	0.73	0.71	1.82	1.90	1.86	5.50	5.49	5.82
Years of education of HH head[2]										
Kenya	6.2	0.8	6.0	10.6	0.9	5.7	10.6	0.8	5.8	11.1
Mozambique	3.2	0.1	3.0	6.5	0.1	3.1	6.4	0.2	3.1	6.4
Zambia	6.9	2.9	7.1	10.8	3.5	7.2	10.5	3.9	7.2	10.6
Per capita household income										
Kenya	553.9	304.1	388.3	430.2	445.4	536.3	620.6	544.3	749.3	868.7
Mozambique	57.8	36.1	44.3	75.4	51.5	47.7	61.6	52.5	73.5	83.9
Zambia	122.3	72.2	102.0	209.5	84.8	101.5	167.4	101.0	116.6	176.2
Off-farm income share (%)										
Kenya	29.5	27.2	30.3	41.1	29.0	25.5	35.1	18.5	24.7	32.1
Mozambique	27.3	20.7	28.8	48.4	16.6	26.5	25.6	18.7	25.5	36.7
Zambia	28.5	26.1	35.8	52.2	19.5	24.9	35.4	16.0	21.7	29.6

Source: Kenya (Tegemeo Institute Rural Household Surveys, 1996/97 and 1999/00 crop seasons, Tegemeo Institute); Mozambique (Trabalho Inquerito Agricola 2001/02 production season); Zambia (Post Harvest Survey and Supplemental Survey to the Post Harvest Survey, 1999/00 production season, Central Statistical Office.
Landholding terciles: Kenya (<0.94 ha, 0.94-1.90 ha, >1.90 ha), Mozambique (< 0.89 ha, 0.89-1.69 ha, >1.69 ha), Zambia (< 1.4 ha, 1.4-2.4 ha, >2.4 ha)
Education terciles: Kenya (0-3 yrs, 4-7 yrs, 8-18 yrs), Mozambique (0-1 yrs, 2-4 yrs, 5-19 yrs), Zambia (0-6 yrs, 7-8 yrs, 9-19 yrs)
Notes: 1) Landholding in Kenya refers to area cultivated; in Mozambique and Zambia it refers to total land access, including rented land.
2) Education in Mozambique computed for maximum education in the household (among individuals over 15 years).

2.5 Civil Disturbances

Africa has a high incidence of civil war. Of the eight African countries with per capita incomes under US$200 during the 1990s, six of them have experienced prolonged civil war–Ethiopia, the Congo, Mozambique, Sierra Leone, Burundi, and Somalia (World Bank 2001). There remain a number of weak and failed states, beset by internal violence and external pressures.

Fortunately, there are positive signs of progress. As measured by Freedom House, the number of "free" countries in Sub-Saharan Africa increased from two to eight between 1990 and 2000, the number of "partly free" countries increased from 15 to 24, while the number of "non-free" countries fell from 26 to 13 (Wolgin, 2001). There is, in many countries, a free and vibrant press. Human rights abuses, with some notable exceptions, are declining. More stable political and security conditions should provide important direct and indirect benefits for the livelihood of the small farm.

2.6   HIV/AIDS

Another trend of great concern for small farm agriculture in Africa is the HIV/AIDS epidemic. Twenty years since the onset of the disease, relatively little is known regarding how farm households respond to illness and death and the interventions that would best fit their needs. Because rigorous applied analysis of the impacts of AIDS on rural farm households has been slow to materialize, most of our understanding is based on conceptual models, macro-projections that lack a solid micro-level foundation, and sociological or anthropological community case studies that, while highly detailed and informative, present difficulties for generalization or extrapolation.

For example, most attempts to date to assess the impacts on the agricultural sectors of hard-hit African countries have been theoretical and have relied heavily on the simple logic that loss of an adult due to AIDS causes severe labor constraints in households, resulting in lower area cultivated and a shift towards less labor intensive (lower value) crops, such as cassava or sweet potatoes, and away from more labor intensive (higher value) cash crops (Toupouzis and du Guerny 1999; Harvey, 2004). The subsequent implication of this logic is that HIV/AIDS mitigation policy should prioritize agricultural labor-saving technologies and other assistance such as food aid targeted to afflicted households.

Given the cost of large-scale survey research in Sub-Saharan Africa, and perhaps a perception among donors and ministries of agriculture that HIV/AIDS is a 'health sector issue' (which is beginning to change), it is perhaps not surprising that there are few empirical studies of the effects of HIV/AIDS on rural household welfare and livelihoods. Yet there is some emerging evidence from large-sample micro-level surveys as well as macro-level data which can complement earlier surveys and case studies and serve to validate or modify the predictions of the theoretical literature.

2.6.1 Macro- and micro-level labor supply

The catastrophic death toll that is projected to occur over time in these countries has led many analysts to conclude that the disease will cause acute labor shortages in the "high HIV prevalence" countries of Sub-Saharan Africa, thus requiring adjustments in crop technologies

and farming systems to less labor-intensive production techniques. Undoubtedly, the human and social costs are indeed monumental. However, it is important to take account of the momentum of underlying population growth rates when projecting the trend in future population. Demographic projections indicate that while AIDS is projected to erode population growth to roughly zero in the seven hardest-hit countries of Africa, the net result is a roughly stable number of working age adults over time (Jayne et al, 2005b). Yet the oft-mentioned prediction of a macro-level labor shortage is derived from the difference between the demographic 'with-AIDS' projected scenario and the 'without-AIDS' scenario (what would have happened in the absence of AIDS). However, this difference ('population loss') is considerably larger than that between the 'present day labor force' and the projected size of the labor force in 20 years taking into account the impact of AIDS. Thus, while AIDS-related mortality figures predict a monumental human catastrophe, they do not indicate any major decline in labor-to-available-land ratios (Table 5) and thus, in our view, do not justify the call by some organizations to alter the priorities of agricultural research systems toward labor-saving technology. As a contrasting view, analysts such as Lipton (2005) argue for technologies that are relatively labor-intensive.

Household-level findings suggest that land/labor ratios of many afflicted households are similar to those of non-afflicted households, and imply that agricultural labor may not be the principal production constraint for most afflicted households (Mather et al., 2004). Barnett et al. (1995) conclude from case study research in Uganda, Tanzania, and Zambia, that the effects of adult mortality on rural livelihoods may vary considerably across and within countries given numerous factors such as the extent of HIV infection, labor requirements of the predominant cropping system, population density, and the size of the local labor market. Recent work by Dorward (2003) uses a non-linear programming model and a household typology in Malawi to predict input and output responses to various shocks, such as price, drought, and adult illness. They find that responses to adult illness such as reduced area cultivated and outcomes such as lower yields vary considerably by characteristics of the household, such as percentage loss in household labor, income and asset levels.

Table 5. Comparison of Total Population Size for the Seven Hardest-hit Countries,[*] 2000 vs. 2025

Sex/age categories		2000 estimated	2025 forecasted "no-AIDS" scenario	2025 forecasted "with AIDS"
		------------- Projected Population (millions) ----------------		
Males	< 20 years	18.6	22.9	16.8
	20-59 years	17.5	32.1	18.6
	> 59 years	2.1	4.7	3.2
Females	< 20 years	18.9	23.0	16.4
	20-59 years	17.7	32.6	17.8
	> 59 years	2.3	5.4	3.5

[*] Botswana, Lesotho, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe
Source: US Census Bureau, 2003.

2.6.2 Macro- and micro-level changes in cropping systems

Some studies have conjectured that HIV/AIDS is likely to lead afflicted households to shift towards less labor-intensive crops, such as roots and tubers. While such crops typically demand less overall labor and allow for more flexibility in the timing of labor inputs, they tend to be lower in value and nutrition than cash and grain crops. Particular emphasis has been put on the recent shift in area cultivated from maize to roots and tubers, observed in several countries in eastern and southern Africa. While these crop shifts could be related to HIV/AIDS-related illness and death, it is important to acknowledge that recent crop and input policy changes in many eastern and southern African countries have affected the relative output/input price ratios for grain crops relative to roots and tubers, reducing the profitability in some areas of grains as compared to roots and tubers (Jayne et al., 2005b).

Using household survey data from Mozambique, Rwanda, and Zambia, Mather et al (2004) found that the *ex post* percentage of area cultivated to roots and tubers was similar among households with and without a prime-age death. While one cannot infer from mean *ex post* results alone whether or not afflicted household cropping has changed over time, the results still demonstrate that the *ex post* cultivation of roots and tubers – labor-saving crops – was not on average higher among most afflicted households, as compared with non-afflicted households.   Impact analysis using panel data from Tanzania found that although some farm activities were temporarily scaled back after a male death and wage income fell, afflicted households did not shift towards subsistence crops (Beegle, 2003). Likewise, Yamano and Jayne (2004) found no significant shifts toward root and tuber cultivation in the case of death of any household member, but did find other significant shifts in cropping patterns for households within the lower half of the income distribution which suffered a household head/spouse death. For example, households with a male head/spouse death incurred a significant decline in area cultivated to sugarcane, tea, and horticultural crops, a result related not to labor shortage *per se* but due to loss of the man's land title which serves as a pre-condition to participation in outgrower schemes.

The results suggest that when gender is a main determinant of participation in an economic activity, as with many cash crops (and often with non-farm income), the loss of the participating adult (male) may leave the surviving spouse without access to the activity. Addressing the gender bias in agricultural production and marketing knowledge and opportunities (and education, in the case of non-farm opportunities) could contribute significantly to improved income potential for many households.

2.6.3 The New Variant Famine hypothesis

The New Variant Famine theory proposes that the general burden of care in both affected and non-afflicted households has reduced the viability of rural livelihoods, and reduced the resilience of rural communities to external shocks such as drought (de Waal, 2003). If true, this suggests that the non-afflicted population is not a reliable control group for examining the effects on afflicted households. Yet, this also implies that aggregate welfare indicators in the hardest-hit countries should decline over time, at least that the bottom quartile of households.

Zambia presents a reasonable test case for the NVF theory given that HIV rates are among the highest in Africa at 17 percent (1999), and has been hit by occasional droughts throughout the past decade. The micro-level survey data evidence from annual nationally-representative

production data from 1990-2003 does not appear to support the NVF at this point in time. At the national level, rural per capita calories from food crops produced by smallholders was stable from 1993-1999 (Zulu et al, 2001). Looking at the 1993-2003 period, median area cultivated and area cultivated per capita increased for all households, the bottom quartile (in crop production value), and the top quartile (Govereh et al., forthcoming). While mean and median crop output value, value/capita, and value/ha are decreasing slightly among all households and the top quartile, they are increasing among the lowest quartile. However, median and mean draft livestock value is decreasing for all quartiles, a result perhaps explained by a severe outbreak of cattle disease in the mid-1990s. Mean value of farm draft equipment is increasing for all quartiles. In sum, there does not seem to be evidence, at least in Zambia, that the lowest quartile of small-scale farm households are showing declining trends in area cultivated, crop output value, or asset values compared to the early 1990s.

2.6.4 Heterogeneity of household-level impacts of mortality

Results from the emerging micro-level empirical literature question the usefulness of a homogeneous conceptualization of 'afflicted households,' especially in the context of proposals for targeted assistance and technology development. This homogenous conceptualization perhaps is a reflection of a general assumption by many that small farm households are relatively homogeneous; a proposition discredited by the heterogeneity of land/labor ratios in the general population as discussed in an earlier section of the paper.

While death of any kind undoubtedly brings hardship and suffering to afflicted households, the magnitude of the economic consequences appears to vary significantly according to the extent to which the deceased tend to be primary breadwinners and core members of the household (Yamano and Jayne, 2004), as well as the household's *ex ante* asset levels (ibid, 2004; Drimie, 2002). In addition, in contrast to the general assumption that HIV-related mortality is typically associated with household heads/spouses, Mather et al. (2004) find in four of the five countries analyzed that a majority of deceased prime-age (PA) adults were not household heads/spouses, and thus not likely to be the primary breadwinners of the household. In another example from Tanzania, among afflicted households, poorer households are less likely to receive financial assistance from social networks – as well as less total assistance when received – as compared to less-poor households (Lundberg et al., 2000).

The heterogeneity of household-level impacts found in these studies is further supported by a recent synthesis of studies using nation-wide survey data to compare selected *ex post* (1-3 years post-death) indicators of welfare for households with and without a recent prime-age death (Mather et al., 2004). The results from five countries in southern and eastern Africa show that although afflicted households may well have suffered negative effects on household crop production and income, the *ex post* land/labor ratios and household incomes of afflicted households are quite heterogeneous, the mean values of which are similar to those of households without a death. However, there are some afflicted households which appear to especially be in need of assistance, for those which have suffered the death of a household head or spouse tend to have lower *ex post* land/labor ratios and income relative to households without a death, and thus are more likely to be in poverty.

The implications of this heterogeneity are important for the design of HIV/AIDS mitigation strategies, as well as for considering the HIV/AIDS epidemic within the context of rural poverty alleviation and growth strategies. First, the evidence cited here suggests that

targeting technology development or assistance to a homogenously-conceptualized group of 'afflicted households' is not a good strategy simply because many of these households are similar in many respects to non-afflicted neighbors. In addition, given scarce donor and national funds for rural development, imposing additional constraints on agricultural technology development (such as developing an additional maize variety which saves labor through greater weed resistance or an earlier harvest) will undoubtedly involve tradeoffs between aspects appropriate for the majority of farm-households, both afflicted and non-afflicted. Perhaps a better approach is to consider that many African countries are facing a serious development crisis, driven by various trends – of which HIV/AIDS is but one -- which together are making small-holder livelihoods and welfare more and more tenuous, particularly for a subset of small-holders with low land access and education.

Social safety nets are needed to help the hardest-hit households avoid falling below minimum asset and nutrition threshold levels. The results cited above suggest that the targeting of mitigation efforts such as food aid should be based on empirical evaluation to identify those afflicted households most likely to be in need in a given country context, rather than on a homogenous conceptualization of 'afflicted households.' Yet for the majority of afflicted small farm households, perhaps the most helpful investments are what many development practitioners already consider to be 'good pro-poor development strategies': improved land tenure; labor-saving technologies for water access (village well), fuel and food processing; redressing gender bias in extension and education and thus access to cash crop and non-farm income opportunities; development and dissemination of improved food crop varieties (for yield, drought/stress, etc, depending upon the resource constraints of marginal farmers).   It is important to establish whether these investments or policies are appropriate for the needs of hardest-hit households while also benefiting other poor but non-affected households at the same time. In short, while safety nets are important for the hardest-hit households to protect their assets, investing in pro-poor agricultural productivity growth appears to be one of the most effective means to respond to the HIV/AIDS epidemic. And since resources are extremely scarce, trade-offs must be made between short-term and long-term approaches for redressing the poverty impacts of AIDS.

2.7 Farm Policies in High-Income Countries and Global Agricultural Trade Policies

The prevailing international agricultural trade policy environment is both hypocritical and not supportive of the small farm. International donors try to convince African governments of the virtues of liberalization and open markets, but then subsidize their agriculture and affect world prices for African imports and exports in the process (World Bank 2000). Are these subsidies (and the food aid generated from them) affecting the long-term competitiveness of African agricultural production and agricultural transformation?

There is widespread dissatisfaction among developing countries with the framework for international agricultural trade agreements. In particular, access to developed country markets has not been achieved to the promised extent, and many developing countries have experienced import surges following trade liberalization. Moreover, the Agreement on Agriculture appears to have been designed largely with "developed country agriculture" in mind, as it institutionalizes the production- and trade- distorting practices employed by the most powerful countries. These countries now enjoy a unique privilege among WTO members, in the sense that the agreement gives them the legal right to continue to affect agricultural markets through their production and trade subsidies.

Each year OECD countries provide roughly $50 billion per year in development assistance, while subsidizing their agricultural production by anywhere from US$350 to US$500 billion per year (McCalla 2001). This is greater than the GDP of Sub-Saharan Africa (Wolgin 2001). Some of these subsidies may help African countries, such as those that are net importers of grains. Recent OXFAM and IFPRI reports draw specific attention to the need for changes in developed country agricultural policies and a more level playing field in global agricultural trade agreements to raise agricultural growth and reduce poverty in Africa and other parts of the developing world. For developed country governments and their citizenry who are truly committed to making globalization work for poor people, most of whom are in agriculture, a more serious public discussion of agricultural protectionism in developed countries and its effects on global poverty will need to be forthcoming.

The real debate on globalization is, ultimately, not about the efficiency of markets, nor about the importance of modern technology. The debate, rather, is about the inequality of power (Sen 2000). The future of the small farm in much of Africa will hinge on national and international negotiations regarding access to developing country markets for goods produced by African farmers and the international supply and price effects of multilateral trade agreements.

2.8 Donor and state support to the small farm is declining

Available evidence suggests that after several decades of strong support, international funding for agriculture and agricultural R&D began to decline in both absolute and relative terms around the mid-1980s as support for economic infrastructure as well as health, education, and other social services began to grow (Pardey and Bientema, 2001). This decline has been particularly acute in Africa, where donor assistance to African agriculture fell dramatically during the 1990's in both absolute and relative terms. From 1991 to 2002, donor aid to African agriculture fell from about USD 1.7 billion to USD 1 billion, and the share of donor aid to agriculture fell from 19 to 10 percent, while that of social services (health and education) increased from 32 to 56 percent (Kane and Eicher, 2004). Yet the role of agriculture in food security and poverty alleviation is no less important in Africa than it was in Asia's food crises of the 1960's and 1970's.

There is an abundance of literature concerning the positive and negative impacts on poverty, equity, and the environment in developing countries of Green Revolution modern rice and wheat varieties (MVs) – the technologies that embody the early decades of agricultural R&D. A review of 292 impact studies demonstrates that rates of return to agricultural research remain quite high and have not fallen over time (Alston *et al.*, 2000). Yet, favorable rates of return alone have not alleviated continued (and increasing) under-investment in agricultural R&D.

In addition, international agricultural research systems are faced with the dilemma that while funding levels for agriculture and agricultural R&D have declined in recent years, demands on agricultural research systems to develop agricultural technologies which are more sustainable, equitable, and better-targeted to marginal areas have increased. International agricultural research systems have switched from the "high payoff input" approach (Hayami and Ruttan, 1985; Schultz, 1964), based on modern varieties and the use of external inputs, to

a broader concern for sustainable agriculture and technologies for marginal areas, including maintenance research and reduced reliance on external inputs (Byerlee, 1996).

What explains the decline? The sharp cutback in donor aid to African agriculture since the early 90's can be partially attributed to donor frustration over three decades of the poor performance of many donor-financed agricultural programs (e.g., aid tied to policy reform conditionality) and projects (T&V extension, livestock ranches, and support of parastatal marketing boards).

In addition, most African governments have given low priority to agriculture and rural development. Although the conventional wisdom is that the fiscal resources available to African governments have been slashed under the burden of structural adjustment, this picture does not square with the actual figures. In a cross-country study, Jayarajah and Branson (1995) find that state revenues as a proportion of GDP declined at most one percentage point during the course of World Bank adjustment programs. Nashashibi et al. (1992) conclude that, after implementing macro reform policies, real government revenues went up in nine African cases and down in nine, relative to a "base year." According to published World Bank data across Africa (excluding South Africa and Nigeria), government revenues have declined from an average of 16.3 percent of GDP during 1975-1984 to 15.8 percent from 1990-1996. Thus, while there is abundant evidence that government investment in physical infrastructure, agricultural research, and other key public goods has declined, this trend cannot be explained by severely reduced government revenues in most African countries.

Under-investment in agricultural research in Africa has had serious long-term consequences for agricultural growth. International agricultural commodity prices have declined as efficiency in production and marketing have improved in other parts of the world. Commensurate declines in production and marketing costs have generally not occurred for most important crops in Africa.

To allow incomes of its people to rise, African governments need to invest in their own agricultural R&D systems on a continuous, sustained basis. It is not clear that this point has really hit home. Many of the locally-generated national poverty reduction strategy papers diagnose the main causes of slow agricultural growth to be market liberalization, weak private sector response, declining primary commodity price trends, unfair international trade agreements, and weather disturbances. Without commenting here on the importance of these factors, the relative neglect of the importance of agricultural research is a glaring omission. While many have blamed poor agricultural performance on a declining terms of trade, to a large extent these trends are reflecting research-driven productivity growth elsewhere in the world. The key message is that government policy designed to promote the interests of the small farm and agricultural transformation would recognize that innovation and technical change must be continuous and sustained, and this requires sustained investment in agricultural research and extension systems.

Unfortunately, as with education, the benefits to investments in agricultural research accrue mainly over the long run. Governments all over the world, by contrast, tend to have short-term time horizons. Other types of expenditures of scarce public resources may provide more immediate payoffs that are of greater direct interest to governments. This situation has the classic characteristics of a social trap (Platt 1973): certain actions that are beneficial to society in the longer run remain dormant because of insufficient short-term benefits in a

world of immediate demands. A key challenge, therefore, is how to provide incentives for governments to reallocate their expenditure patterns. Second, what can be done to induce international lenders and donors to re-prioritize agriculture in their development assistance portfolios? The share of the World Bank's and USAID's development budget allocated to agricultural has declined markedly in the past 20 years (World Bank 2000; Attwood 2000). Ruttan (1996) and Mellor (1998) argue that the programming of foreign aid has been captured by myriad special interest groups, including child survival, vitamin A deficiency, microcredit, poverty, microenterprise, empowerment of women, environment, wildlife preservation, etc. Notwithstanding the importance of these activities, the question is whether these topics have shifted attention and resources away from the basic processes of growth, which will most likely start with agriculture.[4] Deriving the tax revenue to finance these other useful investments is also largely dependent on agricultural growth.

3. Where From Here?

The co-existence of relatively low levels of small farm productivity in Africa and the availability and widespread use of technical knowledge and productivity-enhancing inputs in many other parts of the world indicates the need for attention to the barriers to the adoption of productivity-enhancing inputs in African agricultural systems. From the point of view of the individual farmer, it is clearly not a single problem or factor that describes the opportunity set. It is a system. Individuals and communities have limited capacity to deal with the circle of poverty alone. While many factors contribute to poverty, the problems in addressing poverty largely lie in the political-economic environment which structures economic incentives.

Agricultural transformation and consequently structural transformation can only be realized if players in technology generation, institution building, and policy function collaboratively and in a coordinated fashion. Policy-oriented marketing research will need to expand its emphasis from the liberalization of markets to the identification of strategies that will give the incentives to invest in new productive patterns of investment and exchange for the millions of low-input semi-subsistence rural households in the region. This implies a major role for future research in identifying organizational arrangements that can concentrate the technical and management know-how, capital and financing, labor, and connections to local and international markets on the small farm. Outgrower arrangements and farmer cooperatives are two such organizational forms that have tried, with varying levels of success in the past (Dorward, Kydd, and Poulton, 1998). Notwithstanding their mixed history, we feel that it is likely that the future of the small farm will greatly depend on whether farmer-driven organizations (variants of cooperatives or outgrower companies) can succeed in overcoming past difficulties so that their theoretical benefits can be achieved in practice. The need for group coordination seems clear when considering how the majority of small farms in Africa – working as individual units -- can reasonably be expected to acquire the financing required for input purchase, cutting edge technical production know-how, the market clout to access

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[4]Mellor (1998) argues that there was some justification for these special interests in Asia, particularly after the green revolution succeeded in stimulating growth and incomes, "which spawned a legitimate concern for second generation problems—of women, children, and the poor, and of environmental enhancement...But Africa never had the first generation solutions. Indeed, the quest for second-generation solutions has stood squarely in the way" (p. 40).

domestic and international markets on favorable terms, and the political voice in domestic politics to garner some influence over public resource allocation.

These solutions will be fundamentally country-specific, dependent upon the current set of market rules, property rights, exchange arrangements, experience and perceptions derived from history, and organizational structure in each country. Promising areas for future research involve how to create the incentives, through attention to the institutional underpinnings of markets, for coordination between farmer organizations (accountable to farmers), multinational input and commodity trading firms, a supportive public sector, and an expanded role for commodity exchanges, forward contracting, and other mechanisms to reduce the costs and risks of investing in the entire food system. Finding workable strategies to implement these scenarios is likely to be the key challenge facing the future viability of the small farm in Africa well into the twenty-first century.

Increased commitment to agricultural science and technology development appropriate to small farm and semi-arid conditions is likely to be crucial. Lipton (2005) and Bagwati (2005) propose performance contracts between donors and international seed companies to achieve specific outcomes, such as developing hybrid maize varieties profitable over a range of stated areas and conditions. Such innovations may help re-focus the priorities and energies of the private agricultural research industry, which currently may not see the commercial incentives to focus on small, low-income farmers with little effective demand.

Given the existing distribution of landholding sizes within the small farm sectors of eastern and southern Africa, land reform or land redistribution may need to be on the agenda. Farmer organization can help to some extent to overcome dis-economies of scale associated with small farmers' attempts to acquire inputs and marketing output. However, the evidence suggests that farm size within the small farm sector is continuing to gradually decline with modest population growth and the closing of the land frontier in many parts of the region (Jayne et al., 2003). The bottom 25% of rural agricultural households are virtually landless, having access to 0.10 hectares per capita or less in each country examined. Under existing conditions, the ability of this bottom land quartile to escape from poverty directly through agricultural productivity growth is limited by their constrained access to land and other resources. Viewed in a static way, one could conclude that the only way out of poverty for the severely land-constrained rural poor is to increase their access to land. Viewed within a dynamic structural transformation framework, this group's brightest prospect for escape from poverty (which is by no means a sure thing) is likely to involve being "pulled" off the farm into productive non-farm sectors. Abundant evidence of the transformation process elsewhere indicates that growth in non-farm sectors typically starts from a robust stimulus to agriculture, which generates rural purchasing power for goods and services. For many African countries, this implies increased crop productivity in order to increased household disposable income for non-staple crops and consumer goods. During this process, there will be high payoffs to education, as the most highly skilled households have the best access to the well-paying non-farm jobs. Therefore, while greater equity in land holding and increased food crop productivity is critical to rural poverty reduction in the short run, an important long run goal may be to enable the rural poor to access skilled off-farm jobs through investments and policies that support the processes of structural transformation. Education, which played an important role in Asia by allowing households to exit agriculture into more lucrative off-farm jobs, is relatively low in most areas of rural Africa by world standards. Investments in rural education and communications are likely to become increasingly important to facilitate structural transformation.

Even though the AIDS crisis requires immediate action, dealing with the disease in the most cost effective way will require much more research on how alternative interventions affect rural household behavior, under the range of different farming systems found in eastern and southern Africa. At the moment, there is very little knowledge to guide how donor organizations should balance their efforts between mitigation strategies targeted at highly-affected communities vs. long-term pro-poor growth strategies such as investments in agricultural science and technology, extension systems, education, and market development. For the majority of afflicted small farm households, perhaps the most helpful investments are what many development practitioners already consider to be 'good pro-poor development strategies': improved land tenure; labor-saving technologies for water access (village well), fuel and food processing; redressing gender bias in extension and education and thus access to cash crop and non-farm income opportunities; development and dissemination of improved food crop varieties (for yield, drought/stress, etc, depending upon the resource constraints of marginal farmers).

Strategies to link African farmers to markets must take account of the inequality in productive assets and low crop productivity, which contribute to highly concentrated patterns of agricultural surplus generation within the smallholder sector, and to the constraints on household diversification into higher-value crop production imposed by food market instability. Yet the issue of how to stabilize food markets and prices are transcended by issues of governance. The aims of promoting producer and consumer welfare can be promoted – in principle – through either direct government operations or through private trade. In actual experience, neither approach has worked very well. Effective governance is central to the effective operation of both state enterprises and markets. Marketing boards have a mixed track record in Africa. But attempts to rely on markets, given a chronic under-provision of public goods investments, often fail too. The evidence seems clear that, without increased government and donor support for public goods investments to drive down the costs of production and marketing, the future for smallholder farms in Africa is not good. But such investments will also need to be complemented by a policy environment that acknowledges the extreme concentration of marketed staple food output and the possibly anti-poor effects of policies concentrating on transferring benefits to staple food sellers rather than investing in market institutions and infrastructure that promote a broad range of crops, including those likely to be more important for cash incomes on very small farms.

Lastly, we underscore the importance of an honest and open treatment of the behaviors of both donor organizations and governments in high-income countries that currently compromise the effectiveness of development assistance. While these problems are thorny indeed, a more honest discussion is the first step toward tackling them. Failing to address them will simply prolong the problem. Given the general agreement that much larger financial commitments will be necessary to achieve a long-term growth path for African agriculture and its allied sectors, education and health, it will be crucial to develop the conditions for more effective absorption and use of development assistance (Bagwati, 2005). Reform is required of both donor and local governments, as well as the international trade environment. This will certainly require enlightened leadership on all fronts, with the honesty to be frank about the incentive problems, and the political will to overcome them. In such a political environment, there would be reason to be strongly optimistic about the potential for the small African farm, as well as for the emerging interdependent social and economic systems in the rest of the world.

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Appendix 1: Notes on the National Rural Household Datasets

Kenya: Analysis is based on survey of 1,578 small-scale farming households surveyed in 1997 and re-surveyed in 2000. The survey was designed and implemented under the Tegemeo Agricultural Monitoring and Policy Analysis Project (TAMPA), implemented by Egerton University/Tegemeo Institute, with support from Michigan State University. The sampling frame for the survey was prepared in consultation with the Central Bureau of Statistics. First, 24 districts in the nation's 8 agriculturally-oriented provinces were purposively chosen to represent the broad range of agro-ecological zones and agricultural production systems in Kenya. Next, all non-urban divisions were assigned to one or more AEZs based on secondary data. Third, proportionally to population across AEZs, divisions were chosen purposively from each AEZ. Fourth, within each division, villages and households within selected villages were randomly selected. We excluded from this analysis two pastoral districts (40 households) that differed substantially from other zones and had high rates of attrition. Of the 1,538 remaining households that we attempted to revisit in the 2000 survey, 1,460 households in six provinces were located and re-interviewed, and these households form the basis for analysis in this paper.

Mozambique: In 2002, the Mozambican Ministry of Agriculture and Rural Development (MADER) in collaboration with the National Institute of Statistics (INE) conducted the Trabalho do Inquerto Agricola (TIA) survey. The sampling frame was derived from the Census of Agriculture and Livestock 2000, and was confined to small- and medium-scale farm households. The sample was stratified by province (10 provinces) and agroecological zones. Eighty of the country's 128 districts were included in the sample. A total of 4,908 small and medium-sized farms were interviewed in 559 communities that were the primary sampling units. The sample is nationally representative of rural farm households to the provincial level.

Zambia: The Post Harvest Survey of 1999/2000 and the linked 2001 Supplementary Survey (SS) to the Post Harvest Survey, both conducted by the government's Central Statistical Office, are the basis for the Zambia data reported in this paper. The sample is considered nationally representative of small- and medium-scale farm households to the provincial level. The PHS/SS is based on a sample frame of about 8,000 small-scale (0.1 to 5 hectares) and medium-scale farm households, defined as those cultivating areas between 5 to 20 hectares. Large-scale farmers are not included in this survey. Households were included in the sample only if they were found through initial screening questions to cultivate crops or raise livestock. Because the PHS is an agricultural household survey, by definition, the sample contains no landless households.

Ethiopia

The data come from two sources: the 1995/6 Annual Agricultural Sample Survey (ASS), fielded by the Ethiopian Central Statistical Authority (CSA) and the Food Security Survey (FSS), fielded on a subset of ASS households in 1996 by the CSA and the Grain Marketing Research Project. The 1995/6 Agricultural Sample Survey uses the same frame of enumeration areas (EAs) as used to conduct the 1994 Population Census. Some 615 rural EAs in 373 weredas are sampled out of roughly 60,000, with probability proportional to population size.   In each of the EAs, 25 farm households are randomly selected, for a total of 15,374 households. Out of these, 7 are randomly sampled to be in the Food Security Survey, some 4,112 households total.