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Smallholder Agriculture in East Africa: Trends, Constraints and Opportunities

Adeleke Salami, Abdul B. Kamara and
Zuzana Brixiova



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AFRICAN DEVELOPMENT BANK GROUP

Smallholder Agriculture in East Africa: Trends, Constraints and Opportunities⁽¹⁾

Adeleke Salami, Abdul B. Kamara and Zuzana Brixiova

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Abstract

Adeleke Salami, Abdul B. Kamara and Zuzana Brixiova

Smallholder agriculture continues to play a key role in African agriculture. This paper investigates trends, challenges and opportunities of this sub-sector in East Africa through case studies of Kenya, Ethiopia, Uganda and Tanzania. In these agriculture-based economies, smallholder farming accounts for about 75 percent of agricultural production and over 75 percent of employment. However, contributions of smallholder farming, and agriculture in general, to the region's recent rapid growth during 2005 - 08 have remained limited. Instead, growth was driven by services, in

particular trade. This paper finds that at the national level, weak institutions, restricted access to markets and credit. These factors, including inadequate infrastructure, have constrained productivity growth of smallholder farming. Measures needed to improve productivity of smallholder farmers include ease of access to land, training to enhance skills and encourage technology adoption and innovation, and removal of obstacles to trade. At the regional and global levels, international trade barriers need to be addressed.

Keywords: Smallholder agriculture, institutions, productivity, case studies, East Africa

JEL classification: O13, Q1, P52

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ACRONYMS AND ABBREVIATIONS

ACP	Africa Caribbean and Pacific
ADLI	Agriculture Development Led Industrialization
AEO	African Economic Outlook
AERC	African Economic Research Consortium
AfDB	African Development Bank
AGOA	African Growth and Opportunities Act
AGRA	Alliance for a Green Revolution in Africa
ARD	Agriculture and Rural Development
AU	African Union
BROSDI	Busoga Rural Open Source Development Initiative
CAADP	Comprehensive African Agriculture Development Program
CERUDEB	Centenary Rural Development Bank
CIRPÉE	Inter-University Center on Risk, Economic Policies and Employment
COMESA	Common Market for Eastern and Southern Africa
DFID	UK Department for International Development
DPPA	Disaster Prevention, Preparedness Agency
DSGD	Development Strategy and Governance Division
EAC	East African Co-operation
EAC	East African Community
EBA	Everything But Arms'
EDRE	Development Research Department
EGTE	Ethiopian Grain Trade Enterprise
EU	European Union
FAO	Food and Agriculture Organization
FDCF	Financial Deepening Challenge Fund
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
ICT	Information and Communication Technologies
IFAD	International Fund for Agriculture Development'
IFPRI	International Food Policy Research Institute
IGAD	Inter Governmental Authority on Development
IIED	International Institute for Environment and Development
IMF	International Monetary Fund
ITC	International Trade Centre
KACE	Kenya Agricultural Commodity Exchange
KTDA	Kenya Tea Development Authority

MAAIF	Ministry of Agriculture, Animal Industry and Fishers (Uganda)
MDGs	Millennium Development Goals
MCA	Millennium Challenge Account
MFPED	Ministry of Finance, Planning and Economic Development (Uganda)
MOFA	Ministry of Foreign Affairs (Uganda)
MTID	Markets, Trade, and Institutions Division
MTTI	Ministry of Tourism, Trade and Industry (Uganda)
NEPAD	New Partnership for Africa's Development
NGO	Non Governmental Organizations
NMB	Tanzania's National Microfinance Bank
NSE	Nairobi Stock Exchange
NTBs	Non-Trade Barriers
ODA	Official Development Assistance
ODI	Overseas Development Institute
OECD	Organization for Economic Cooperation and Development
OSAN	Agriculture and Agro-Industry Department
PEAP	Poverty Eradication Action Plan
RATIN	Regional Agricultural Trade Intelligence Network
R&AWG	Research and Analysis Working Group
ReSAKSS	Regional Strategic Analysis and Knowledge Support System
RIFF	Regional Integration Facilitation Forum
RMC	Regional Member Countries
SADC	Southern African Development Community
SSA	Sub-Saharan Africa
TAI	UNDP Achievement Diffusion Index
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
USAID	US. Agency for International Development
WFP	World Food Program
WOUGNET	Women of Uganda Network
WTO	World Trade Organization

1. INTRODUCTION

1.1 Background

Until recently, the African agricultural landscape was characterized by sluggish growth, low factor productivity, declining terms of trade, and often also by practices that aggravated environmental problems. Since the late 1970s to mid 1980s, many African countries have implemented macroeconomic, sectoral and institutional reforms aimed at ensuring high and sustainable economic growth, food security and poverty reduction. Some recent agricultural growth accelerations notwithstanding, the sector's growth remained insufficient to adequately address poverty, attain food security, and lead to sustained GDP growth on the continent (Dessy et al., 2006 and World Bank, 2008).

All four East African countries examined in this study - Ethiopia, Kenya, Tanzania and Uganda - can be characterized as "agriculture-based," that is, agriculture is the backbone of these economies.¹ Agriculture is dominated by smallholder farmers who occupy the majority of land and produce most of the crop and livestock products. The key long-standing challenge of the smallholder farmers is low productivity stemming from the lack of access to markets, credit, and technology, in recent years compounded by the volatile food and energy prices and very recently by the global financial crisis. Despite the number of sound agricultural policies adopted by most countries, implementation has been lagging. Moreover, growing disenchantment of some donors with the sector amplified the gap between policy formulation and implementation. Continued involvement of a few donors, including the African Development Bank (AfDB), notwithstanding, investment in agriculture has suffered from a declining trend in several decades before the crisis. The recent surge in food prices as well as the need for greater diversification towards domestic-oriented production brought about by the financial crisis could serve as a wake up call for the sector to receive due attention, given its importance and untapped potential.²

African smallholder farmers can be categorized on the basis of: (i) the agro-ecological zones in which they operate; (ii) the type and composition of their farm portfolio and landholding; or (iii) on the basis of annual revenue they generate from farming activities. In areas with high population densities, smallholder farmers usually cultivate less than one hectare of land, which may increase up to 10 ha or more in sparsely populated semi-arid areas, sometimes in combination with livestock of up to 10 animals (Dixon *et*

¹ In agriculture-based economies, rural population accounted on average for almost 70 percent of total population, while agriculture amounted on average to 29 percent of GDP in 2005. Annual agricultural growth during 1993 -2003 amounted to 4 percent and slightly exceeded that of non-agricultural growth (3.4 percent). At 51 percent in 2002, rural poverty remained substantial (World Bank, 2008).

² The African agriculture is believed to have an enormous potential for growth given the continent's natural resource endowment (FAO, 2009).

al, 2003). On the basis of farm revenue, smallholder farmers range from those producing crops only for family consumption to those in developed countries earning as much as USD 50,000 a year (Dixon *et al*, 2003). Most smallholder operations occur in farming systems with the family as the centre of planning, decision-making and implementation, operating within a network of relations at the community level.³ In this study, smallholder farmers, defined on the basis of land and livestock holdings, cultivate less than 2 hectares of land and own only a few heads of livestock.

Taking a close look at agriculture in four countries of East Africa is timely, especially given the countries' rapid pre-crisis growth rates of 7.3 percent during 2005 - 2008. These growth rates were attributed to relatively stable macroeconomic conditions, reduced conflict since the mid-1990s, improved governance and market liberalization, as well as increased private sector involvement in their economies. Furthermore, the institutional advancements, stronger regional and sub-regional organizations, and stronger civil society and community networks have made governments more accountable and thus also contributed to the impressive economic performance (AfDB/IFAD, 2009; AfDB and World Bank, 2009). Given that all East African economies are agriculture-based, it is important to understand to what extent the sector contributed to the strong growth performance before the crisis.

While Africa's longer-term growth has been threatened by the impact of the global financial and economic crisis, growth performance of East Africa has remained strong. In October 2009, the AfDB predicted that Africa's economic growth would reach only 3.9 percent in 2010 (up from 2 percent in 2009), well below the pre-crisis rates. With an expected growth rate of 5.8 percent in 2010 though, the longer-term growth prospects of East African countries, and especially the agriculture sector, remain bright for several reasons. Firstly, provided that these economies continue to expand at rapid rates, their growth will translate into increased incomes and upward shifts in the aggregate demand for higher value-added agricultural products, such as processed food. This will generate opportunities for expansion of more complex production and value-addition in the agriculture sector in the region. Secondly, the focus of donors on infrastructure will improve market access of the agriculture sector, leading to economies of scale. By utilizing their comparative advantages, smallholder farmers would be able to specialize and exchange products through markets. Put differently, smallholder farmers would become market-oriented agricultural producers. Finally, since the majority of the poor is engaged in smallholder agriculture, there is need for a better understanding of its contributions to attaining the MDGs and reducing poverty in East Africa.

Despite the importance of smallholder agriculture in East Africa, the strategic conceptual and empirical analysis in the context of the crisis, which would guide policymakers and development practitioners in their efforts to revitalize agriculture in the aftermath of the crisis, is sparse. Moreover, recent studies tend to examine specific constraints to smallholders' activities (Liverpool and Winter-Nelson, 2010; Reardon *et al.*, 2009; Markelova *et al.*, 2009; Obare *et al.*, 2003 and others), but do not take a

³ Smallholder farming is often referred to as family farming, subsistence farming and low-income farming.

comprehensive view of the sector. In contrast, this paper investigates the overall trends, challenges and strategic opportunities for smallholder agriculture. The study aims at helping this important segment of the population to benefit from opportunities emerging from East Africa's economic growth and increasing regional integration. The analysis has also examined how the recent escalation of food prices and related opportunities can be seized to fully utilize East Africa's agricultural potential, with a view to applying experiences and best practices from East Africa to the rest of the continent.

1.2 Objectives of the Study

The study investigates the trends, constraints and opportunities facing smallholder agriculture in East Africa in light of the enormous changes taking place in the world and on the continent, as well as the evolving international financial conditions. The study has the following objectives: (i) to assess the performance and future challenges and opportunities facing the smallholder agriculture in East Africa; (ii) to highlight the conditions under which smallholder agriculture in the region can be revitalized and effectively adapt to (and where possible benefit from) the changes in the external environment such as the food and fuel price rises, the global financial and economic crisis; and (iii) to guide the Bank's development operations in the sector, with a view to helping it deliver more effective support to East African agriculture.

1.3 Methodology

The study was conducted by the Bank's Development Research Department, with the support and collaboration of the Agriculture and Agro-Industry Department (OSAN) and the Bank's field offices in the study countries. The study combined review of the existing literature and country case studies on Kenya, Ethiopia, Uganda and Tanzania. The countries studied were selected based on the size of their economies, the high proportion of smallholder farmers (over 75 percent) and relatively high contribution of agriculture to the GDP.

In addition to drawing on the Bank's database, secondary data on agricultural policies, agricultural output, processing and other economic indicators were obtained from relevant government institutions and agencies such as the FAO, IFAD, IMF, World Bank, country research institutes, and other agencies. The interpretation of the data was informed by discussions with relevant country officials from the study countries.

1.4 Structure of the Study

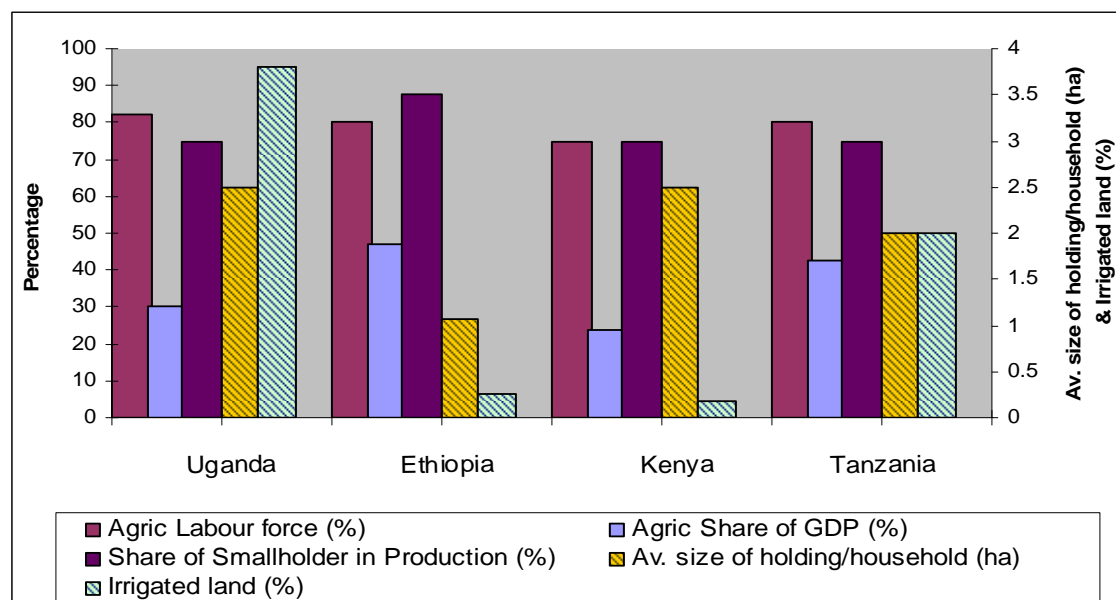
The remainder of the report is organized as follows. Section two examines the trend in agricultural development in East Africa, with a focus on the performance of smallholder agriculture. Section three analyzes the major constraints to smallholder agricultural production, while section four outlines the opportunities for revitalizing smallholder agriculture in the region. Section five presents conclusions and policy implications.

2. TRENDS IN SMALLHOLDER AGRICULTURE IN EAST AFRICA

2.1 Smallholders and Agricultural Development

The four East African economies covered in the study – Uganda, Ethiopia, Kenya and Tanzania— are all agriculture-based, but there are variations in terms of the sector’s contribution to GDP. In Ethiopia and Tanzania, agriculture remains the main contributor to the GDP, contributing 47 percent and 43 percent, respectively. In Uganda and Kenya, however, the rapid development of the service sector with a growth rate of about 9.5 percent, has outpaced agriculture, contributing 45 percent and 60 percent of the GDP, respectively, far above agriculture’s contribution of 30 and 34 percent. Nevertheless, agriculture still accounts for about 75 percent of the labor force in all the study countries, underscoring the importance of the sector in job creation and poverty reduction across countries (Figure 2.1 and Table 2.1).

Figure 2.1: Economic Contributions of the Agricultural Sector in 2007



Source: AfDB (2009) and FAOSTAT (2009).

Table 2.1: Economic Profile and Contribution of Agriculture to the Economy 2007

Economic Indicators	Uganda	Ethiopia	Kenya	Tanzania
Population (million)	31	78	38	40
GDP (USD billion PPP)	29.04	62.19	58.8	48.9
GDP Per capita (USD)	900	800	1,700	1,300
GDP Growth Rate (%), 2000 – 2007	6.5	11.4	7	7.3
Agricultural GDP Growth Rate, 2000-2007	7.1	10.0	7.1	6.9
Agriculture Share of GDP (%)	30.2	47	23.8	42.8
Industry (%)	24.7	13.2	16.7	18.4
Services (%)	45.1	39.8	59.5	38.7
Agricultural Labour force (%)	82	80	75	80
Total Land Area (000' km ²)	236	1,127	583	945
Arable land area cultivated (%)	21.7	10	8	4.23
Irrigated land (%)	3.8	0.26	0.18	2
Ag. size of holding/household (ha)	2.5	1.06	2.5	2
Share of Smallholder in Production (%)	75	87.4	75	75

Sources: AfDB (2009) and FAOSTAT (2009).

In spite of its population that is almost double that of the three other countries and vast land area, Ethiopia has still not realized a commensurate economic potential, as the country has the lowest per capita GDP in this group and one of the lowest on the continent. Its economy, however, has recorded the highest growth rate (11.4 percent on average) in recent years including in agriculture.⁴ With respective GDP growth rates of 6.5 percent, 7.0 percent and 7.3 percent in 2008, Uganda, Kenya and Tanzania have also been able to realize high growths of GDP per capita, but the contribution of agriculture to growth in these economies has been mixed. For example in Uganda, agriculture contributed only marginally to Uganda's rapid GDP growth of 2005 – 08 (Table 2.2). Instead, growth was driven by services, in particular trade.⁵

⁴ Growth was mostly driven by public investment with minimal involvement of the private sector.

⁵ The low contribution of agriculture to the overall growth holds for other countries as well, with exception of a few years in Kenya and Ethiopia.

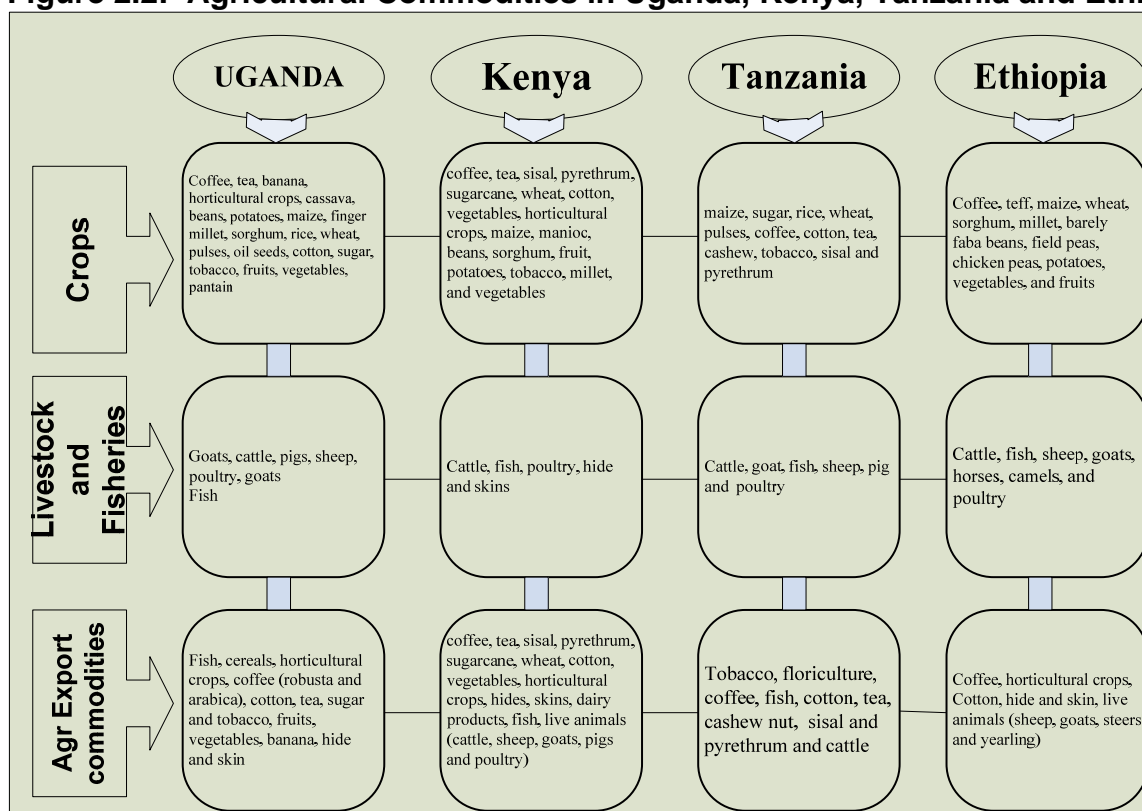
Table 2.2: Contributions of agriculture to growth in Uganda, 2005 - 2008

	2004	2005	2006	2007	2008
	(In 2002 Shillings)				
Total GDP	13,467	14,814	15,859	17,156	18,582
Agriculture	2,773	2,842	2,791	2,838	2,902
Industry	3,139	3,658	3,892	4,201	4,571
Services	6,590	7,170	7,908	8,537	9,444
Net taxes	965	1,144	1,269	1,580	1,666
	(growth in percent)				
Total GDP	...	10.0	7.1	8.2	8.3
Agriculture	...	2.5	-1.8	1.7	2.3
Industry	...	16.5	6.4	7.9	8.8
Services	...	8.8	10.3	8.0	10.6
Net taxes	...	18.5	10.9	24.5	5.4
	(contribution to growth)				
Agriculture	...	0.5	-0.3	0.3	0.4
Industry	...	3.9	1.6	1.9	2.2
Services	...	4.3	5.0	4.0	5.3
Net taxes	...	1.3	0.8	2.0	0.5

Source: Authors with data from Ugandan Bureau of Statistics

Over 75 percent of the total agricultural outputs in the four countries are produced by smallholder farmers with farm sizes of about 2.5ha on average, producing mainly for home-consumption, and using traditional technologies. Limited commercial and semi-commercial production also occurs. Besides, less than 4 percent of total land area is irrigated. Major crops include cereals, root crops, banana tea, pyrethrum, sisal, cut flowers, coffee, cotton and tobacco. Coffee, cotton, horticulture produce and tea are the main export crops. Cattle and poultry dominated the livestock sub-sector. Other important livestock produced are sheep, pigs and goat (see Figure 2.2 for a detailed list of agricultural products produced by the four case study countries). Forestry, horticulture and fishing are also important economic activities in most of the study countries. In particular, horticulture is becoming the largest sector in the Kenyan economy, generating annual revenue of about USD 2 billion, with 240 large scale producers and over 150,000 smallholder farmers, and employs 1.5 million laborers.

Figure 2.2: Agricultural Commodities in Uganda, Kenya, Tanzania and Ethiopia



Source: Authors, 2009.

Moreover, food security in the studied countries remains a challenge, despite the significant potential to boost agricultural production. Realizing this potential requires policy re-orientation, particularly enhancing access to markets and credit, adoption of technology, and increasing crop variety. Raising productivity, that is increasing the persistently low agricultural yields, requires also improved access to agricultural inputs. Thus, policies that enhance access to both input and output markets remain key. In particular, improving small farmers' access to traditional and emerging markets requires attention.

2.2 Smallholder Agriculture and Poverty Reduction

By definition, agricultural growth is the primary source of poverty reduction in most agriculture-based economies. The expansion of smallholder farming can lead to a faster rate of poverty alleviation, by raising the incomes of rural cultivators and reducing food expenditure, and thus reduces income inequality (Mellor 1966, 1976; Magingxa and Kamara 2003; Diao and Hazell 2004; Resnick 2004; Bahram and Chitemi 2006; Anríquez G. and K. Stamoulis, 2007; and World Bank, 2008). As observed by Ravallion (2001), a rise in average household income by 2 percent leads to a fall in the poverty rates by about 4 percent on average. The 2008 World Development Report also observed that GDP growth originating in agriculture is about four times more effective in reducing poverty than GDP growth of other sectors (World Bank, 2008).

Various estimates have indicated that there have been positive, though marginal, changes in the poverty profiles of the four studied countries, but not to the level needed to meet the MDG1- Eradicate extreme poverty and hunger. Most of the household surveys conducted in the four countries in the last two decades showed that poverty is more prevalent among rural dwellers. Also, changes in poverty levels by employment across sectors indicate that change in poverty status among rural dwellers engaged in agriculture was higher than among rural populations engaged in other vocations. In addition, change in poverty among farmers and fishing folks in the rural sector was higher than change in poverty level among those engaged in other occupations in urban centers, except those engaged in paid employment and self employment.

Specifically, the share of poor people (poverty head count index) in Ethiopia is estimated to have declined from 45.5 percent in 1995/1996 to 38.7 percent in 2007 (Table 2.3). In 2004/05, the proportion of the population below the poverty line stood at about 39.3 percent in rural areas and 35.1 percent in urban areas. In Kenya, the proportion of the poor declined from about 52.3 percent in 1997 to 45.9 percent in 2005/06. While the percentage of the poor declined marginally in rural areas from 46.4 percent in 1997 to 42 percent in 2005/06, urban poverty was reduced by 16.5 percentage points from 43.5 percent in 1997 to 27.4 percent in 2005/06. The declining trend of poverty is also evident in Uganda, where about 56 percent of the population lived below the poverty line in 1992/93, but 31 percent in 2005/2006. However, poverty in Uganda is not evenly distributed, but rather concentrated in rural areas. For example in 1995/96, about 50 percent of the population lived below the poverty line in rural areas, compared to 20 percent in urban areas. In Tanzania, recent estimates show that there has not been any significant change in poverty distribution by sector and region over the past two decades, with the majority of the poor being concentrated in the rural areas.

Table 2.3: Trends in Poverty Indices (% below the poverty line)

National	Year	National	Urban	Rural
Ethiopia	1995/96	45.5	33.2	47.5
	2004/2005	38.7	35.1	39.3
	2007	38.0	NA	NA
Kenya	1997	52.3	49.0	53.0
	2005/2006	45.9	NA	NA
Tanzania	1991	35.6	28.1	40.8
	2007	33.6	NA	33.3
Uganda	1992/93	56	NA	NA
	2005/2006	38	NA	31.3
SSA	1993	45	NA	NA
	2004	40	NA	NA

Sources: Authors, computed from various national data (2008).⁶⁷

⁶ NA= not available.

Transition from agriculture to other sources of income (such as paid-work or self employment and entrepreneurship) presents far higher potential for poverty reduction. In this context, many suggest that increase in productivity in agriculture that would allow movement of workers from agriculture to other sources of income and in particular industrialization are necessary for growth and poverty reduction (Gollin; Parente; and Rogerson, 2002). A substantial untapped potential exists also in the form of rural entrepreneurship.

Against this background, it can be concluded that the modest reduction in poverty witnessed in the four East African countries can be attributed to the contributions of the agricultural sector, especially smallholder farming. The improvement in the poverty status, however small, has implications for the nutrition of households and consequently feeds back to agriculture.⁸

2.3 Agricultural Productivity

Agricultural productivity is one of the key determinants of high and sustained agricultural growth, and in fact a key determinant of its growth over the longer term. Faster agricultural growth has put countries on the path of a much broader transformation process: rising farm incomes raising demand for industrial goods; lowering food prices, curbing inflation and inducing non-farm growth, and creating an additional demand for workers. Rising on-farm productivity also encourages broad entrepreneurial activities through diversification into new products, the growth of rural service sectors, the birth of agro-processing industries, and the exploration of new export market (Harvey, 2006; World Bank, 2008).⁹ To sum up, as Gollin, Parente and Rogerson (2002) underscore, rising agricultural productivity releases farmers for other activities, leading to structural transformation needed for Africa's income to catch up with more advanced economies.

Countries with abundant land or rapid expansion of off-farm work have expanded the area cultivated per worker by adopting labor-saving technologies. Given the relative abundance of land in the case study countries, a temporary sectoral growth strategy reliant on expansion of area could be considered as consistent with their resource endowments (Gordon, 2008). It would follow the historic path of other land-rich countries, such as Argentina, Australia, Canada, the Russian Federation, and the United States. In those countries, labor productivity rose sharply as additional land was brought into cultivation. Growth was accompanied by marked structural change in farming and by rapid technological adoption, largely in mechanical technology, that

⁷ Sources include: Tanzania's National Bureau of Statistics, 2002, 2007; MoFED, 2006; Kenya National Bureau of Statistics, 2007; and UNDP, 2007)

⁸ As more people rise above the poverty line of USD 2 a day, the demand for animal products such as milk, butter, egg and meat increase. People earning above USD 2 a day consume more of the high value products with high nutritional value, compared to those below poverty line who live solely on cereals.

⁹ Harvey (2006) emphasized the strong linkage between agricultural productivity, small-scale farmers and economic growth. He noted the impact of agricultural productivity on transformation of poor countries to prosperous ones and concluded that increasing agricultural productivity is a necessary condition for poverty alleviation.

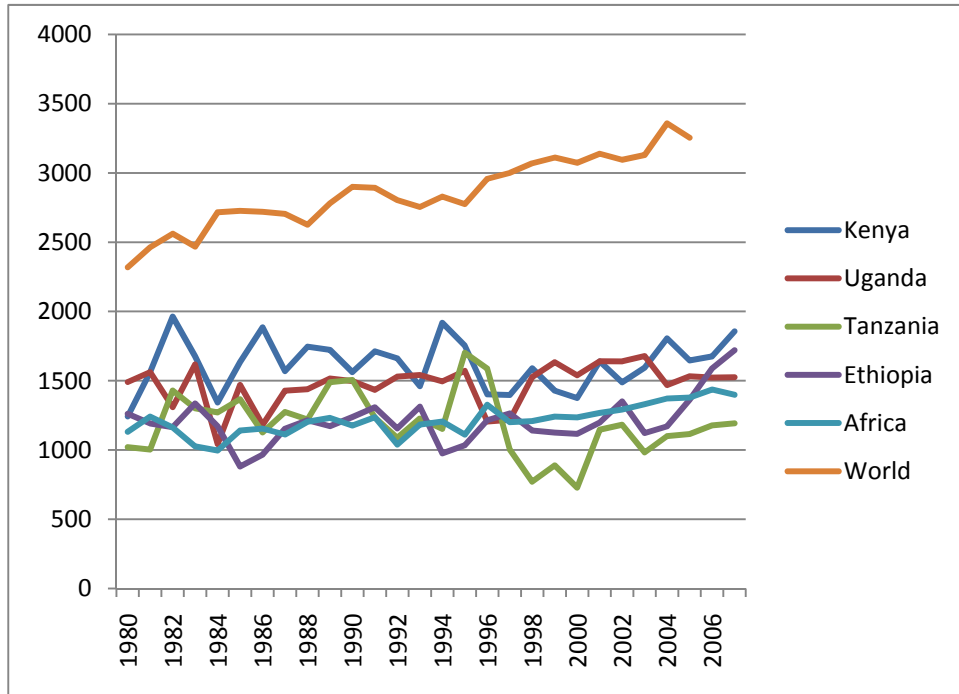
reduced labor requirements in agriculture. Over the longer-term, technological improvements and productivity gains would need to drive the agricultural growth in East Africa as well.

The experience of the four countries and their strategies for agricultural growth can be also viewed in the global context. The international experience shows that countries that have achieved sustained agricultural growth have done so by adopting technology, which led to increased joint productivity of land, labor and capital (that is total factor productivity). Whether the pattern of technological change has been labor saving or land saving has depended on which factor is relatively scarce. In East Africa, the access to additional available land for agricultural purposes has been the major constraint (Section 3).

These general findings are supported by a recent study on Ethiopia by Dercon and Zeitlin (2009). The authors posit that technology adoption and expanding land holdings of individual smallholders, that is changes in factor ratios, lead to productivity gains. However, technology adoption and increased access to land influence the overall productivity in different ways. While technology adoption improves productivity of all factors of production, increased access to land raises labor productivity at the expense of land productivity. The authors underscore the role of economic incentives and high returns on technological adoption and agricultural innovation.

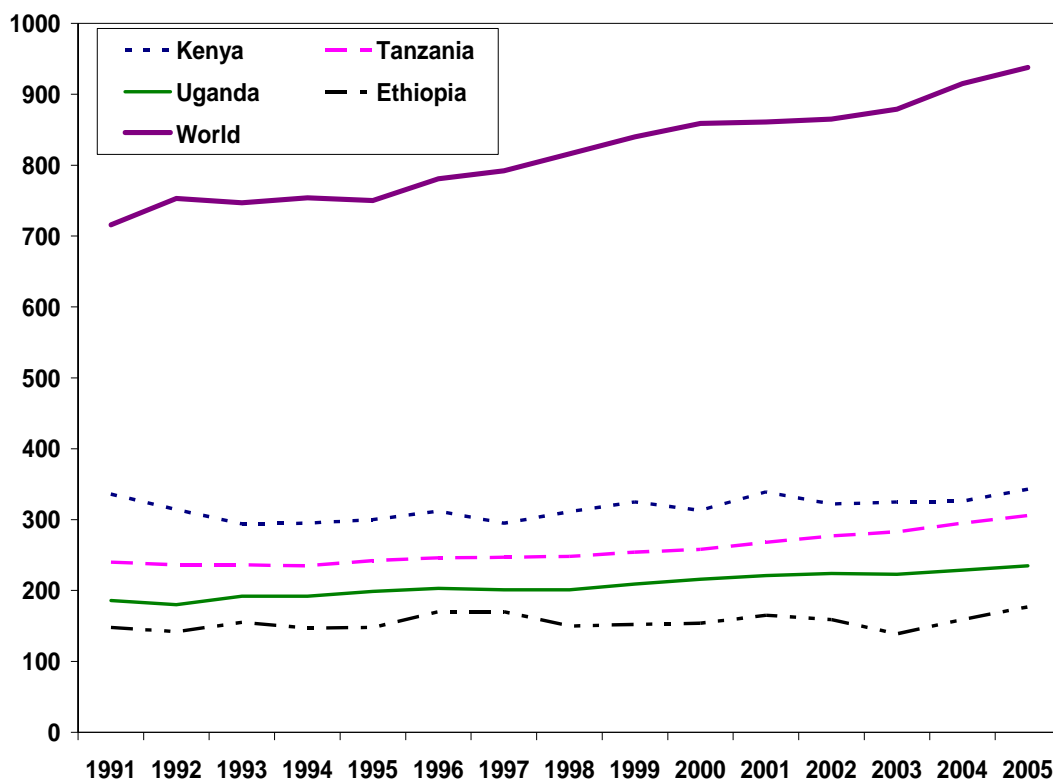
The cereal yield per hectare remained virtually unchanged in all four countries during 1980 – 2007 and it is also way below the world average (Figure 2.3). It is in this context that Oxford Analytica (2009) concluded from its strategic analysis of East African agriculture that the yields of staples such as rice and maize are only about one-half to one-third of what they could be with the proper application of fertilisers, irrigation and seeds. Similarly, the agricultural value added per worker in the four countries has showed an upward trend in the last five years, although with the average level far below that of the world average and short of the level needed to reduce rural poverty (Figure 2.4).

Figure 2.3 Cereal Yield (kg per hectare), 1980 - 2007



Source: National Statistical Offices.

Figure 2.4: Agriculture Value Added Per Worker (Constant 2000USD), 1991 – 2005



Sources: AfDB (2009) and World Bank (2009).

According to World Bank (2007), the average farmer in sub-Saharan Africa produces only one ton of cereal per hectare – less than half of what an Indian farmer produces, less than a fourth of a Chinese farmer’s production, and less than a fifth of an American farmer’s production. East African countries thus need to draw on the experiences of land-scarce Asian countries (Box 2.1) where yield increases in crops were the defining characteristic of the Green Revolution and transformation of the rural sectors between the 1960s and the 1990s. The success of the Asian Green Revolution hinged on smallholder-focused productivity transformation with crucial implications for poverty reduction, food security and economic growth.

In general, land expansion using existing techniques carries environmental costs as forests and wildlife areas are encroached on, and fish stocks depleted. Moreover, as increasingly marginal land comes into cultivation, productivity declines. The agricultural growth path thus needs to combine features of the land-intensive and labor-intensive models that conserve the resource base and thus will differ from the past experiences. Because of the diversity of East Africa’s endowments, growth paths deriving from better cultivation of larger tracts will be optimal in more land-abundant parts of the countries, whereas those associated with high yields and intensive cultivation will suit areas with less abundant land. Where an increase in area per worker is possible (in relatively land-

abundant areas), total factor productivity (yield) increases would be less crucial in the near term. The converse applies to areas where land is scarce – in such cases yield increases are necessary even in the short-term.¹⁰

The implications of improvements in agricultural productivity vary among four case study countries based on their resource endowments, demographic characteristics, marketing opportunities, business climate, and accumulated physical and human capital. So far, the countries have achieved their agricultural growth more through expansion of cultivated areas than through yield increases, pointing to limited technology adoption and outdated agricultural practices. This is in marked contrast with other parts of the world, where almost all agricultural growth is the result of yield increases. In East Africa, as elsewhere in Africa, increases in the productivity of land on the scale of the Asian Green Revolution have been elusive, although some progress has been achieved in specific areas such as the uptake of improved varieties of maize, beans, and cassava.

Box 2.1: Lessons from Agricultural Success in Asia

The greatest success stories in agricultural growth and poverty reduction emerged from the “green revolution” in east, south-east and parts of south Asia. This applies especially to China and India, which together account for 40 percent of the world’s population. Both countries have implemented a series of economic reforms in the past two and half decades: China initiated this process at the end of the 1970s, while India began in the early 1990s. The reforms have led to rapid economic growth, with a growth rate of 8–9 percent per annum in China and 6–7 percent per annum in India. The dramatic agricultural yield increases were associated with new high-yielding crop varieties (of rice and wheat), irrigation, and use of inorganic fertilizers and pesticides. In parallel, the countries undertook heavy investment in rural infrastructure, extension, agricultural research, credit systems for input purchases, and interventions in input and grain markets (Dorward *et al.*, 2004).

The Asian green revolution made a dramatic contribution to world food supply, through lower food prices as well as high economic growth, resulting in poverty reduction. The determining factor in the Asian “green revolution” was the increased productivity of land through enhanced crop varieties, extended application of fertilizers and improvements in irrigation facilities. At the same time, concerns emerged regarding overuse of chemicals, loss of biodiversity, soil degradation, pest problems, and nutritional and risk implications of monoculture systems (Bhalla and Singh, 2001).

In India, food grain production increased by 3.5 percent a year throughout the 1980s, helping poverty reduction. The incidence of poverty declined from over 50 percent in the early 1970s to 35 percent in the late 1990s. Public expenditure on agricultural development (with subsidies on fertilizers and credit) and rural infrastructure were key determinants of agricultural growth and poverty reduction (Fan *et al.*, 2004). India’s small-holder farmers (those owning less than 2.0 ha of farmland) comprise 80 percent of the country’s farmers, but own only 33 percent of the total cultivated land; they nonetheless produce 41 percent of the country’s food-grains. Their productivity is somewhat higher than that of medium- and large-size farms. Moreover, their marketable surpluses are increasing. In 1970, the *small-size* holdings in India were net buyers or produced meager surpluses. However, in the 1990 and beyond they were generating a marketable surplus of 7.2 Mt / ann (million ton per annum) of rice, 1.3 Mt / ann of wheat, 2.1 Mt / ann of coarse cereals, and 1.7 Mt / ann of oilseeds.

In China, national interests were important in generating the agricultural reforms that commenced in 1978. This followed two decades of policy failures during the Great Leap Forward and the Cultural Revolution had weakened the economy and damaged the credibility of the political leadership. Economic reform was initiated in 1978 in the agricultural sector because of a “perception at the top that stagnation of agricultural productivity was a bottleneck hindering further development of the overall economy”. The key elements of the reform package were: (i) abolition of the communal property rights; (ii) the introduction of the household Contract farming; (iii) price and market liberalization; and (iv) legal reforms (Guo *et al.*, 2007). In both China and India, commercially-oriented small farms were major beneficiaries of the public interventions, particularly land policies, grain marketing, support services, and agricultural R&D. These issues are important in the more fragile and diverse African agro-ecosystems as well.

Sources : (Peacock *et al.* , 2004; Gulati, Fan, and Dalafi, 2005; Hazell *et al.* , 2007; and Singh, Kumar and Woodhead, 2002)

3. CONSTRAINTS TO SMALLHOLDER AGRICULTURE IN EAST AFRICA

Smallholder agriculture in the four East African countries studied has been facing numerous constraints. While some are unique to each of the countries, most are of a similar nature, implying that common solutions would address them across countries. The constraints discussed below are not new, but rather long-standing and perhaps even chronic. In addition to smallholder farmers, the constraints to some extent also impact large-scale or plantation farmers.

3.1 Long-standing Constraints to Smallholder Agriculture

3.1.1 Land Tenure, Access Rights and Land Management

The uncertainties regarding land tenure and the inadequate access to land have been a critical challenge to smallholder farming in East Africa. These problems can be examined from different perspectives. The constraints related to the tenure system, such as insecurity of land tenure, unequal access to land, lack of a mechanism to transfer rights and consolidate plots, have resulted in under-developed agriculture, high landlessness, food insecurity, and degraded natural resource. Furthermore, the available land in East Africa is overly subdivided into small and uneconomic units, resulting generally in fragmented production systems and low productivity. In fact, the farm sizes range from as low as about 1ha per household in Ethiopia and 2.0 ha in Tanzania and 2.5ha in Uganda and Kenya.

Despite their small sizes, the landholdings in the study countries exceed the African average of 1.6 ha, but remain well below those of North America (121 ha), Latin America (67 ha) and Europe (27 ha). In addition to this very low absolute level of landholding, the distribution of available land is highly inequitable. Specifically, households in the highest per capita land quartile in East and Southern Africa control 5 to 15 times more lands than households in the lowest quartile. In Kenya, for example, mean farm sizes for the top and bottom land quartiles were 6.69 and 0.58 hectares, respectively, including rented land (Jayne et al., 2006).

The land ownership issues go well beyond small sizes of plots. For example, in Ethiopia, all land is state-owned, according to the country's 1994 constitution. In practice, traditional land tenure arrangements prevail as an outcome of subsistence agriculture, with peasant associations responsible for allocating land to residents (Kamara, *et al* 2004). According to Kebede (2002), privatization of land would seem to be the most effective way to reduce insecurity associated with the tenure schemes and uncertainties created by state ownership.

Equally important, in terms of access to additional land, is proper management of the existing one. According to Kimaru and Jama (2005), in East Africa sustained gains to agricultural productivity are threatened by land degradation, especially land erosion and loss of fertility. A number of programs during the past several decades were implemented by the Swedish International Development Agency and other development partners with a view to preserve the agricultural land in the region.¹¹ The study found that clear land-use and agricultural policies need to be developed to provide a framework for researchers, extension workers and smallholder farmers on environmentally-sensitive practices. Nevertheless, the lack of clarity of property rights and un-equitable access to land exacerbate the land degradation problem.

3.1.2 *Financing Agriculture and Access to Credit*

For investment, smallholder farmers in all four countries depend on savings from their low incomes, which limits opportunities for expansion.¹² For example, a survey of a sample of 344 rural households in Tanzania between May and August 2001 showed that half of total rural household income came from farming, 46.6 per cent from non-farm employment (wages and self-employment) and less than 4 percent from remittances. Because of the lack of collateral and/or credit history, most farmers are bypassed not only by commercial and national development banks, but also by formal micro-credit institutions. In addition to own sources, farmers thus rely on incomes of friends and relatives, remittances, and informal money lenders.

In all countries studied, the share of commercial banks' loans to agriculture has been very low compared to manufacturing, trade, and other services sectors, hampering expansion and technology adoption. For example, in Kenya, the lack of capital and access to affordable credit is cited by smallholders as the main factor behind the low productivity in agriculture. Access to formal credit in Tanzania and Ethiopia is mainly confined to large urban centers, where collateral requirements are high. In Uganda, high interest rates inhibit agricultural investments. While more recently micro-finance institutions have taken financial services to millions of previously un-bankable clients due to innovative instruments, they have so far largely failed to reach poorer rural areas and/or smallholder agricultural producers whose livelihoods are characterized by highly seasonal investments, risks, and returns (Peacock *et. al.*, 2004). The success of the new financing initiatives as exemplified by Equity Bank of Kenya (Box 3.1) and Standard Bank Model (Box 3.2), along the lines of the Grameen Bank in Bangladesh, in providing banking services to the poor including the smallholders needs to be highlighted.

¹¹ In Uganda, for example, land degradation was estimated to lead to annual losses of up to 12% of GDP. While such losses are not reflected in GDP, they reduce living standards and slow development (Kimaru and Jama, 2005).

¹² A study on the rural livelihood in Kenya, Malawi, Tanzania and Uganda by Ellis and Freeman (2002) revealed that farm (i.e., crop and livestock) production accounted for more than 50 per cent of the total household income.

Box 3.1: Mobile Banking and Farmers Access: The Case of Equity Bank, Kenya

Having commenced business in 1984, Equity Bank has evolved from a Microfinance Institution to a publicly listed commercial bank. Several partnerships have contributed to the success of this bank: the Financial Deepening Challenge Fund (FDCF)¹³ in particular partnered with the Equity Bank to set up a fund of £450,150 (USD 654,000) for a mobile bank's project. Equity Bank is bringing mobile banks to some of the most isolated parts of rural Kenya that have no access to commercial financial institutions.

The mobile banks offer banking goods and services to many small businesses and smallholder farmer, providing their customers with the same financial services as in regular branches, including deposits and savings, money transfers, and remittance processing and loans. Such service reduces congestion in the Equity's existing branches and increases the bank's customer reach. Mobile customers pay only an additional small fee for their mobile services relative to the rates for the same transactions at branches.

As Equity's mobile banking scheme extended its reach, five more villages and over 100 smallholders and farmers in Kenya's remote Siaya district now have access to banking facilities. The United Nations Development Programme has provided USD 81 million in loans in partnership with the Equity Bank to set up a fund serving women. Equity's loans are based on an evaluation of a business's cash flow, rather than on collateral. Clients can borrow as little as USD 25 and as much as USD 160,000 or more, depending on their past repayment record.

A major new partnership was launched with Equity Bank to provide smallholder farmers and small agricultural enterprises with the needed financing to break out of poverty and build viable businesses. The Alliance for a Green Revolution in Africa (AGRA), the Equity Bank, the International Fund for Agricultural Development (IFAD) and the Kenya Ministry of Agriculture established a loan facility of USD 50 million (3 billion Kenyan shillings) to accelerate access to affordable financing for 2.5 million farmers and 15,000 agricultural value chain members such as rural input shops, fertilizers and seed wholesalers and importers, grain traders, and food processors. This loan facility will operate parallel to a USD 5 million "cash guarantee fund" from AGRA and the International Fund for Agricultural Development, which will reduce part of the risk of lending by the Equity Bank.

Sources : AGRA and FDCF's website, Africa Renewal (2009) and [www.enterprisechallengefund.org/ecfund/Uploadfile/EquityBank_CaseStudy\(1\).pdf](http://www.enterprisechallengefund.org/ecfund/Uploadfile/EquityBank_CaseStudy(1).pdf)

Furthermore, spending on agriculture by most African governments is also very low at an average of 6 percent of total expenditures since 1980. Some spend as low as 1 percent of their budget on agriculture. In the four case study countries, the share of agriculture in government budgets between 2002 and 2008 averaged between 3.5 percent and 17 percent (see Table 3.1). Apart from Ethiopia which recorded 14, 13, 17 and 12 percent in 2004, 2005, 2006 and 2008 respectively, the three other countries had far below 10 percent of their national budgets, pledged at the Maputo (in Mozambique) meeting by African Union (AU) Heads of State and Government in July 2003. The low public spending is a serious concern given the shortage of adequate

¹³ The FDCF funds and supports twenty-eight projects in Africa and Asia that help improve access to financial products and services by low-income customers. The FDCF is managed by Enterplan and funded by the UK government through the Department for International Development.

rural infrastructure (power, roads and water supply) and the need to develop efficient input and output markets, and functional extension services.

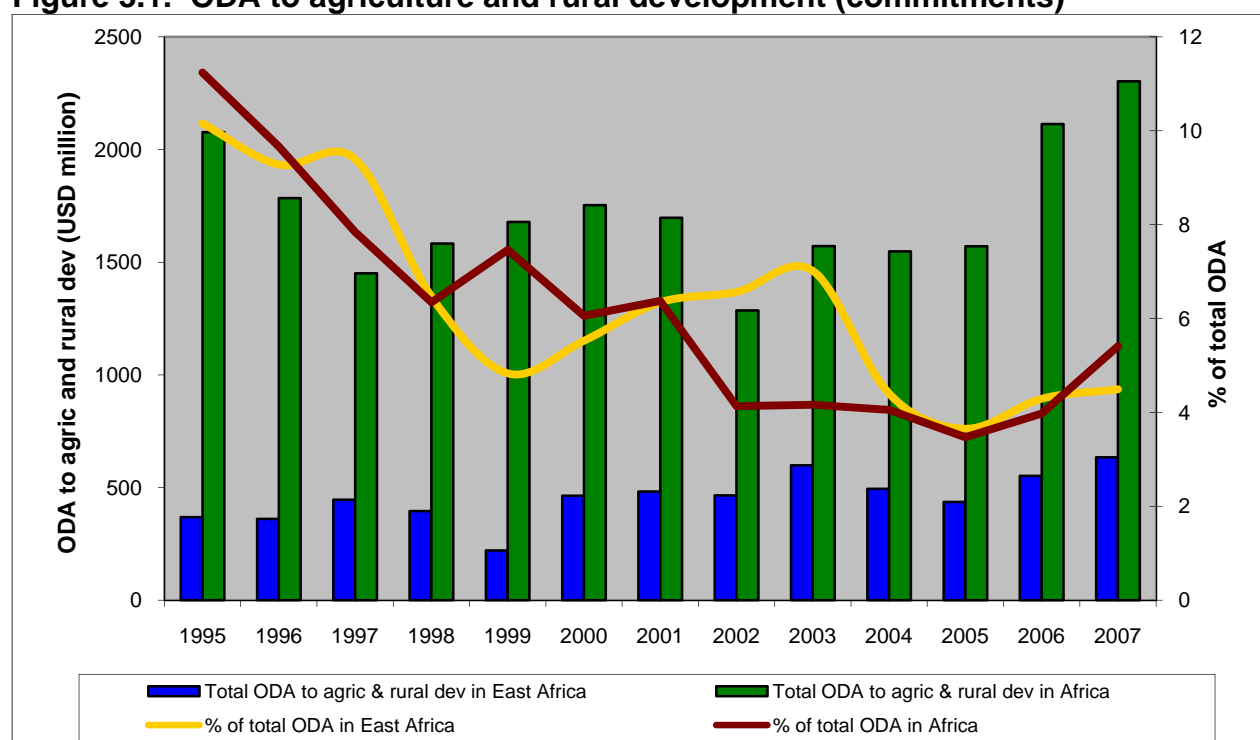
Table 3.1: Public Expenditure on Agriculture (As Percent of Total Expenditure)

	2002	2003	2004	2005	2006	2007	2008
Ethiopia	6.6	9.5	14.3	13.7	17	--	11.7
Kenya	5	4.6	5.1	6.6	5.9	4.4	4.8
Tanzania	4.5	6.8	5.5	5.5	--	--	--
Uganda	4.2	4.2	7	9.7	5.2	3.5	5.4
Africa	4.5	5.6	6.5	6.5	8.2	7.3	8.0

Source: AfDB (2002); IMF (2007)¹⁴, ReSAKSS (2009)¹⁵

Though the total amount of Official Development Assistance (ODA) to agriculture and rural development in East Africa has been increasing in absolute terms, the share of development aid to agriculture and rural development has followed a declining trend. For example, in 1999, ODA to agriculture and rural development reached only about USD 221 million, but it had more than doubled (to USD 634 million) by 2007 (See Figure 3.1).

Figure 3.1. ODA to agriculture and rural development (commitments)



Note: Agriculture and rural development (ARD) includes agriculture, forestry and fishing.

Source: Authors using data from OECD-DAC CRS online database

¹⁴ Government Finance Statistics (IMF, 2007)

¹⁵ Assessed on 05/10/2010 at Regional Strategic Analysis and Knowledge Support System (ReSAKSS) website at <http://www.resakss.org/>

Box 3.2: *Small-scale financing South Africa's Standard Bank Financing Model*

In spite of the agricultural sector's enormous share of continental employment and GDP, less than 1 per cent of commercial lending in Africa goes to agriculture. Moreover, most of the loans to the sector go to large scale farmers, leaving smallholder farmers underserved. The main reason for the lack of interest of commercial banks to lend to agriculture is the risky nature of this activity, due to the constraints discussed in this paper and amplified by fluctuating commodity prices and government inefficiencies. At the same time, microfinance institutions charge high interest rate – at times up to 100per cent interest on trading activities and urban areas, resulting in insignificant allocation of credit to smallholder farmers.

In search for innovative ways to address this long-standing problem, South Africa's Standard Bank, Africa's biggest bank (with experience of over 100 years of large-scale farming financing), signed a USD 100mln deal with Alliance for a Green Revolution in Africa (AGRA) in March 2009. The objective of the deal is to provide financing to small-scale farmers and agricultural businesses in East and South Africa. Specifically, AGRA and the Millennium Challenge Account (MCA) Mozambique will provide a 20 percent default guarantee on the loans to be dispensed in Tanzania, Uganda, Ghana and Mozambique over the next three years.

The new Standard Bank facility is meant to lend USD25m to each of the four countries over three years at prime plus 3-5 per cent to reach 750,000 farmers. Standard Bank also plans to lower the amount of loan guarantee it receives from AGRA and MCA, from 20 percent in year-one to 10 per cent in year-two, 5 per cent in year-three, and finally 0 per cent in years beyond. In conjunction with AGRA and governments of the countries covered, Standard Bank has factored in most risks and problems that make commercial bank lending to the sector , and particularly to smallholder farmers, a “no go” area, aiming to turn lending to agriculture into a profitable activity. Specifically:

- **To reduce** risks related to fertilizers and seeds, **AGRA plans to** invest USD150m in seed companies to located in the four countries. Simultaneously, AGRA is training the farmers so that they are better able to use fertilizers correctly and rotate crops, to reduce land depletion prevalent in East Africa.
- To mitigate **drought-related losses**, AGRA will introduce weather insurance thought utilizing weather-indexed insurance products, building on its experience with this type of insurance in South Africa.
- To reduce the **enormous transaction costs** related to working with smallholder farmers, AGRA has been training agro-dealers, who act as intermediaries between small-scale farmers and markets. It also organized small-scale farmers into co-op groups of 500 to 1000 farmers to ease farm operations and loan administration.
- To get around the **collateral constraint**, the Standard Bank has abolished the collateral requirement altogether in its lending and has instead been mobilizing large corporations to commit to buy the upcoming crops.
- In the future, Standard Bank intends to utilize futures markets to set stable commodity prices in advance.. AGRA is improving on-site **storage technologies**.

Standard Bank is confident of that its public-private partnership approach will deliver the desired result base on the past successful experiences of such scheme in other countries like the Rockefeller Foundation's supported Centenary Rural Development Bank (CERUDEB) in Uganda; the AGRA and Tanzania's National Microfinance Bank (NMB) in Tanzania; the Equity Bank in Kenya and AGRA partnership. However, the new USD100m Standard-AGRA deal collectively is said to be unprecedented in scope. Standard Bank is taking on a risk, hoping to start a way of profitable commercial lending to agriculture, which constitutes a large growth field.

Source: Adapted from Keeler (2009).

These figures are small when compared with an annual estimate on average of USD18 billion per year by the NEPAD Comprehensive Africa Agriculture Development Program (CAADP) to achieve the World Food Summit objective of reducing hunger by half in the whole of Africa (NEPAD, 2002). Moreover, this aid has been mainly concentrated on rural development and infrastructure and to a lesser extent on agricultural research and extension. On the other hand, the share of aid going to agriculture and rural development in the region declined from 11.8 percent to 3.5 per cent between 1995 and 2005, only recovering somewhat to 5.4 percent in 2007. Again, this is still an exceptionally low percentage compared with the percent of ODA going to agriculture and rural development in the region previously (i.e. 11.8 percent in 1995).

From the foregoing, it is clear that there is inadequate funding for agricultural operations in Africa and the case study countries in particular, which negatively affects the farming operations of smallholder farmers. In addition to the countries committing 10 percent of their budget to agriculture, an IFPRI study conducted by Fan and Rosegrant, (2008) revealed that incremental annual investment required in order to achieve MDG1 in East Africa and SSA by 2015 are about USD 2.0 and USD 4.8 billion. This will increase total government agricultural spending to USD 3.8 and USD 13.7 billion per year in East Africa and Africa respectively (Table 3.2).

**Table 3.2: Annual Total Agricultural Spending (USD billion in 2008 USD)
Required to Meet MDG 1 in Africa by 2015**

	Sub-Saharan Africa	West Africa	East Africa	Southern Africa
Total	13.7	9.1	3.8	0.8
Additional/Incremental	4.8	2.8	2.0	0.04

Source: IFPRI Study conducted by Fan S. and M. W. Rosegrant, (2008)

3.1.3 Access to Input and Output Markets

Improved access to input and output markets is a key precondition for the transformation of the agricultural sector from subsistence to commercial production. Smallholder farmers must be able to benefit more from efficient markets and local-level value-addition, and be more exposed to competition. The studied East African countries are still grappling with marketing of both agricultural inputs and outputs, with markets not adequately equipped to serve the needs of the poor. According to the 2005/2006 household survey conducted in Uganda, 30 percent of communities surveyed did not have access to roads that were passable even in the dry season and two-thirds of communities lacked any bus or taxi connections. In most East African countries, more than half the population lives five hours or more from a market center.

On the input side, the average application rates of fertilizer for arable crops in four countries are estimated to be 30 kg/ha/year in Kenya, 14 kg/ha/year in Ethiopia,

5kg/ha/year in Tanzania and 1 kg/ha/year in Uganda – far less than the world average of 100kg/ha/year (Smaling et al , 2006 and Ariga et al, 2006) . There is also the problem of high cost and waste of key inputs such as seed and fertilizers. For this reason, farmers have substantially reduced use of quality inputs such as seed, fertilizer, and pesticides. For example, in 2006, it was reported in UNDP (2007) that the respective use of improved seeds, fertilizers, agro-chemicals and manure were only 6.3 per cent, 1.0 per cent, 3.4 per cent and 6.8 per cent of the parcel of agricultural land in Uganda. Also, the 2007 Tanzania's Poverty and Human Development Report revealed that 87 percent of Tanzanian farmers were not using chemical fertilizers; 77 percent were not using improved seeds; 72 percent were not using pesticides, herbicides or insecticides (agrochemicals), as a result of high costs of agricultural inputs and services (R&AWG, 2007).

On the output side, since the majority of smallholder farmers in the four countries are in subsistence production, marketing is underdeveloped and inefficient. Adequate storage facilities constitute another constraint to both marketing and food security: In Africa, large quantities of agricultural commodities produced by farmers tend to rot away unmarketed, while the smallholder farmers do not have the technology for timely consumption (Kamara, et al, 2002).

An additional key constraint on the output side to raising productivity of smallholder farmers in East Africa has been the inability of most of them to get linked into the supermarket chains. The main barrier is that they cannot meet the high quality and safety demands as well as delivery schedules that international value chains require, preventing them to compete in such markets.¹⁶

3.1.4 Infrastructure

Poor infrastructure continues to impede agricultural activities in Africa, including in the four case study countries. The key challenges are inadequate and poor conditions of the market facilities and transportation systems, including road and rail. Previous infrastructural investments were often ineffective as a result of poor design and poor maintenance, sometime due to stop-go practices of donors funding these investments. The road system, which is the most important for market development in terms of distribution of inputs and output to and from farms, is the most serious infrastructural bottleneck facing agricultural development.

As a result of poor road network, smallholder farmers depend on inefficient forms of transportation including use of animals. In addition, irrigation facilities are poor as less than 4 percent of all agricultural output is produced under irrigation in East Africa,

¹⁶ For example, Neven et al. (2009) examined whether smallholder farmers in Kenya's horticulture sector have been excluded from supermarket channels. They found that a threshold capital is needed to enter the supermarket chain, leaving small farms out. Most of the direct suppliers to the supermarket chains were medium-sized commercial farms, run by well-educated farmers. Small farmers benefited only indirectly, through increased demand for labor.

compared with about 33 percent in Asia (AfDB/IFAD, 2009). In sub-Saharan Africa, including East African countries, average post-harvest losses are estimated to amount to over 40 percent, and even up to 70 percent in some fruits and vegetables) – (UNIDO, 2007).

In Kenya underdeveloped rural roads and other key physical infrastructure have led to high transport costs for agricultural products to the market as well as of farm inputs, reducing farmers' competitiveness. In addition, electricity in rural areas is expensive and often not available; which has reduced investment including in cold storage facilities, irrigation, and processing of farm produce. Lack of storage and processing facilities constrains marketability of perishable goods such as fish, dairy products, and vegetables. The infrastructural and logistic constraints are also impediments to trading. Uganda's links to coastal ports are reliant on a single rail-line through Kenya. For example, the Ugandan government announced in January 2009 that its coffee exports dropped both in volume (8 per cent) and value (23 per cent or USD 10 million) due to logistical problems and limited supply of containers compared with the same month in 2008.¹⁷

3.1.5 Agricultural Extension and Innovation

Research and extension services have been disintegrated and ineffective for any technological transformation to take effect. On average, the case study countries and indeed most African countries spend less than 0.7 percent of agricultural GDP on research. On the other hand some countries, especially the developed ones, spend up to 3 percent (Karugia et al. 2009). In Ethiopia the focus has been on smallholder intensification through improved access to modern inputs like improved seeds and fertilizer. However, delivery systems have not performed as expected, which has caused delays in procurement and distribution of inputs. In Kenya the effectiveness of extension services declined throughout the 1990s due to inappropriateness of the training and visit extension model pursued, delayed adoption of alternative models and sharp reduction in the operational budgets of the sector ministries. In Tanzania, services generally focused on increasing production through short-term technical packages, without paying attention to farmers' circumstances, markets, and sustainability. Despite various attempts to strengthen them, the linkages between research, extension and training were weak, and collaboration between public and private partners limited. The weak technology diffusion and innovation in both Tanzania and Kenya was confirmed by the UNDP Technology Achievement Index (TAI) where they were both listed as marginalized with 0.080 and 0.129 scored respectively (UNDP, 2001).

In Uganda smallholder farming is challenged with new institutional forms of private sector governance, like buyer-driven food chains and supermarkets with high quality and sanitary standards. Removal of implicit and explicit taxes, plus liberalization of the

¹⁷ Utilizing a static model, Gollin and Rogerson (2009) show that a reduction in the share of subsistence agriculture in Africa requires an increase in agricultural productivity and reduction in transport costs.

marketing system, dramatically raised the producer's share in the price of export crops from 9 percent up to 70 percent in some cases, especially coffee. While these measures are positive in the sense that they remove distortions, smallholder farmers have difficulties competing in these liberalized markets (see example of Kenya above).

3.1.6 Policy-Related and Institutional Constraints

As noted earlier all the four case study countries have over time implemented a series of economic reforms and instituted agricultural policy as well as strategic frameworks. So far, however, hopes that policies would bring about positive and durable results remain unmet. The remaining main policy bottlenecks include those that pertain to land tenure and land distribution to different segments of the population, marketing of agricultural commodities and inputs, and price regulatory frameworks. In Ethiopia, for example, the inappropriate agricultural policies related to land distribution, collectivization and rigid price regulation have been identified as one of the constraints to investment in agriculture and hence a handicap to productivity

In Kenya persistently large public borrowing and high lending rates have discouraged investment in agriculture. Even though Tanzania has instituted several agricultural reforms and strategies including the agricultural development framework in the early 1970s and Agricultural Sector Development Strategy (ASDS), most of the policies had no significant impact on the majority smallholder farmers. In Uganda, despite the adoption of the Plan for Modernization of Agriculture in 2002 the smallholder farmers still receive a disproportionately small amount of developmental resources.

No doubt, some of the inability of government to implement these programs stems from weak administrative and technical capacity particularly in ministries of agriculture. Institutional support to agricultural development in the four countries studied has been inconsistent and largely inadequate. As elsewhere in Africa, institutions responsible for agricultural development need to be strengthened, with an emphasis on well-functioning markets and risk management (FAO, 2009).

As the experience of successful agricultural reformers shows, the importance of market oriented reforms for sustained productivity improvements in agriculture cannot be overstated. For example, the increase in rice output and productivity in Vietnam during 1981-1994 can be ascribed mainly to market reforms and in spite of modest growth of most inputs and with limited technological change. The key factor among the Vietnamese market reforms was an institutional change – reform of land property rights, which markedly improved the economic incentives of farmers to use the land efficiently (Che et al., 2006).

At the same time, the experience of Tanzania illustrates that market reforms are necessary but not sufficient for raising agricultural productivity. Even though the country undertook substantial market-oriented reforms during the 1990s, agricultural performance remained disappointing. The main bottlenecks to farmers' more effective supply responses to improved incentives were structural – limited access to markets, credit and inadequate infrastructure (Danielson, 2002). Hence the combined

experiences of Vietnam and Tanzania show the importance of reforming the institutional framework underpinning agriculture as well as the complementarities of reforms in the area of infrastructure, access to markets and to credit.¹⁸

3.1.7 Climate Change and Related Food Security Challenges

Climate change, resulting mostly from global warming, has been among the major causes of reduced agricultural production and productivity in many parts of Africa, including East Africa. In all the four countries, most crop and livestock farming is rain-fed, and therefore, susceptible to weather fluctuations. Over the last three decades the frequency of droughts and floods in East Africa has increased, resulting in crop failures and loss of livestock. Ethiopia has been hit hardest by persistent drought, making food security the key issue for poverty reduction (Box 3.2).

Furthermore, with increasing land degradation, land resilience has been reduced and the effects of drought and floods exacerbated. In 2008, Kenya's tea production fell by about 6 percent as a result of early-season drought. In early 2009, the Kenyan government reported that 10 million citizens were at risk of food shortages, and consequently declared a national emergency and appealed for USD 400 million in aid. The emergency has been caused by a combination of drought; high food prices, and the effects of post-election violence in early 2008 that disrupted farming in the Rift Valley, the country's breadbasket. Unfortunately, early-warning systems are inadequate. Ground-and-satellite-based systems for forecasting medium-term weather and seasonal agricultural output as practiced in countries like India are rare in East Africa.

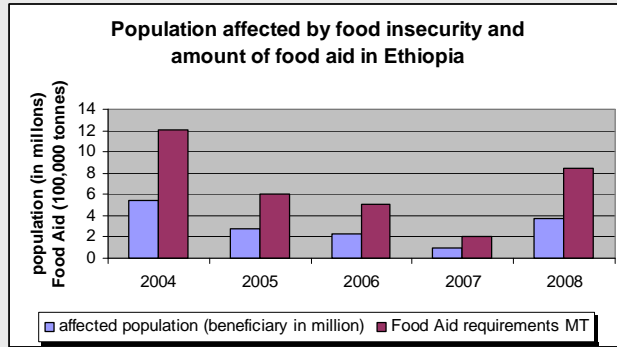
Box 3.3 : Food Security in East Africa: The Case of Ethiopia

Since 1957 Ethiopia has experienced serious droughts culminating in the international reaction following extensive media coverage in 1984. With 75 percent of people dependent on agriculture activities and another 10 percent living entirely on livestock, the country remains vulnerable to weather changes. Famine is also a consequence of policy failures and the ongoing civil war in the north of the country. Ethiopia considered the water tower of East Africa because its highlands are the primary source of the Nile, suffers chronic drought. Currently, the country is faced with the problem of drought as well as volatility in global food crisis that has pushed prices sky high. Over 4 million Ethiopians are affected by food insecurity and require over 800,000 metric tonnes of food aid.

¹⁸ At the same time, as experience of Tanzania illustrates, market reforms are not sufficient for achieving rise in agricultural productivity. For example, structural

Institutions

The principal institution created to manage food insecurity is now named the Disaster Prevention, Preparedness Agency (DPPA) marking a shift in strategy from pure relief provision to limiting the impact of drought. The Agency has developed an Early Warning System that gathers data from multiples sources, including climate data and provides information to a large number of users. For example, the national Meteorological Agency collects, analyzes and produces forecasts and disseminates information in the form of regular Bulletins. The main objective is to ensure timely response and satisfying food security.



Actions Taken

To enhance the preparedness of the DPPA it is now a requirement that 10 day weather forecasts, monthly weather summaries and three seasonal forecasts are provided. Websites of the meteorological office and international organizations and NGOs and other media are used in disseminating such information.

The government actions include safety net, a welfare-for-work program in which more than 7 million chronically needy farmers receive cash or food in exchange for labor on work done on new roads, and other public infrastructure. Regular assessments of various food security indicators are carried out. Two emergency needs assessments are produced twice a year in November and June and are also used in planning appeals for aid. Furthermore, rapid assessments are conducted whenever needed to identify the number of people affected and the need for and type of assistance. The UN World Food Program (WFP), The World Bank Food Security Project and other global institutions play an important role in this process.

Weaknesses

Much remains to be done to improve the early warning system in terms of data quality, personnel, coverage of assessments, and communication of findings.

Conclusion

The food security situation has improved since 1984. Institutions have been established to reduce vulnerability to food insecurity. The problem of climate change and drought is likely to continue. These problems, in addition to external global economic vulnerability are likely adding further pressure on smallholder farmer's output and food security in Ethiopia. However, greater efforts must be directed to increase investment in agriculture and sustainability measures taken to reduce vulnerability.

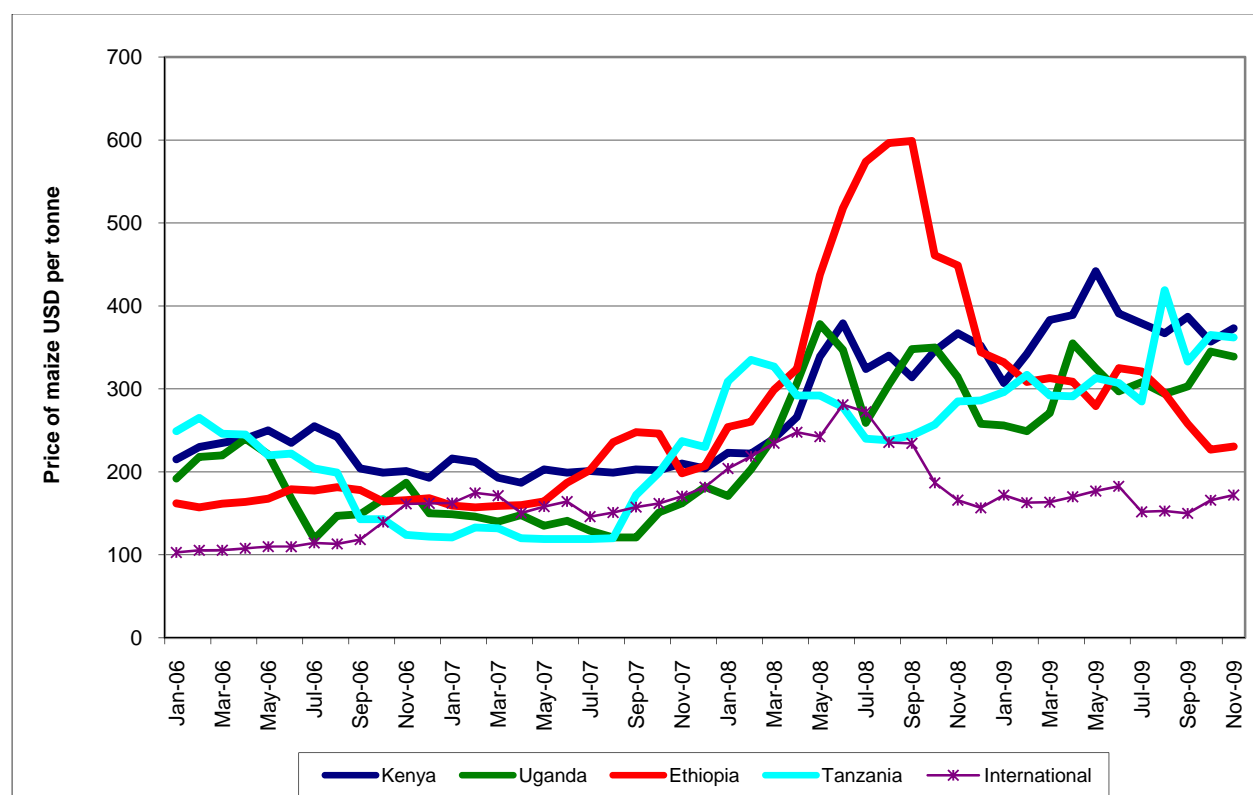
Source: Compiled from International Research Institute for Climate and Society publication, edited by Hellmuth *et al* (2007).

3.2 Constraints related to the Food and Financial Crises

3.2.1 Smallholder Farmers in the Context of the Food Crisis

In 2007 and the first half of 2008, the world experienced a dramatic increase in food prices to crisis levels but these have recently started to fall. Nominal, as well as real, international prices of all major food commodities reached their peak, in nearly 30 years, during the first half of 2008 (Figure 3.2). Although the food market situation differs from country to country the future evolution of food prices remains uncertain with some projections suggesting a permanent shift to higher levels yet for others, it is just a temporary market disturbance that will soon revert to the long-term trends in food prices (Kamara *et al* 2009). On the whole the global food prices have fallen, but not as low as the previous levels before the recent spike and may rise sharply again in the future.

Figure 3.2: Monthly Price of Maize, January 2006- December 2009



Source: Authors using EGTE (2010)¹⁹RATIN (2010)²⁰, FAO (2010)²¹

¹⁹ Data accessed on 05/01/2010 Ethiopian Grain Trade Enterprise (EGTE) at <http://www.egtemis.com/marketstat.asp>

²⁰ Data accessed on 05/01/2010 from Regional Agricultural Trade Intelligence Network (RATIN) at <http://www.ratin.net/>

²¹ Data accessed on 05/01/2010 from FAO website at <http://www.fao.org/giews/pricetool/>

The food crisis led to macroeconomic instability and increasing poverty and hunger levels in many African countries. A vulnerability index²² constructed by the African Development Bank using 2007 data ranks Kenya as the most vulnerable country among the four countries considered in this study, followed by Uganda that is rated as being moderately vulnerable. Vulnerability of Ethiopia and Tanzania are rated as low (Kamara *et al*, 2009).

In 2008, high global food prices contributed to high inflation in many countries, including the four East African countries studied especially in Kenya and Ethiopia where inflation jumped from 9.8 percent and 17.8 percent in 2007 to 25.8 percent and 25.0 percent in 2008, respectively. Inflation also increased in Uganda and Tanzania in 2008 to 12 percent and 10.3 percent from 6.1 percent and 7.0 percent in 2007, respectively.²³ As a consequence of rising production cost, smallholder farmers in most of East Africa cut back on the area planted. Some medium and large scale farmers were able to take advantage of the emerging market opportunities and raise production. Some producers even changed from subsistence farming to more production, which has higher returns per unit area of land. For example, some producers in Uganda have started to sell high value food staples (*matoke*) and buy cheaper foods-maize or cassava flour (IFAD, 2010). By mid-2009 most commodity prices had fallen but are still higher than they were before 2007.

In East Africa, the causes of the food crisis vary from one country to another. Feedback from Food and Crop Assessments as well as relief agencies in those countries suggests that increasing fuel prices contributed to rising food prices in all the countries covered in this study. Rising transport costs affected both output and input prices. In Kenya for example, the cost of fertilizer has more than doubled, with prices reaching USD 1212/MT in the 2008/2009 production season, up from the preceding year's USD 550/MT. Another important factor has been civil unrest in Kenya and northern parts of Uganda. Also important is that food prices continue to be influenced by production levels. In a number of countries, unfavorable agro-climatic conditions like drought are a key factor behind price rises in Ethiopia, Kenya and Tanzania.

Food trends in East Africa do not seem to follow global trends. For example, in 2008 maize prices in Ethiopia continued to rise to more than USD 550 per ton from USD 535 per ton and in Kenya prices initially fell between May and June to USD 320 per ton before rising to about USD 340 in July. Only Tanzania has experienced a continuous fall in maize prices from about USD 330 per ton in January to about USD 240 in July 2008. In Sudan, Eritrea and Ethiopia, wheat prices have been increasing contrary to what has happened on the international market. As with the other cereals, wheat prices vary considerably between these countries. In Ethiopia wheat prices stood at about USD 700 per ton, but were as high as USD 1800 in Eritrea by the end of July 2008. The huge

²² Vulnerability index measures a country's vulnerability to high food prices in terms of the country's: Cereal balance, Ability to pay for food imports, Degree of urbanization and, Import dependency.

²³ On the positive side, a weakening dollar and domestic monetary policies have contained the pass-through of rising global prices into an immediate and proportionate rise in domestic price levels.

price differences in cereals between East African countries reflect the fragmentation of their markets, arising mainly from government controls and poor transport infrastructure.

On the positive side, high food prices may stimulate a supply-side response from food producers with the capacity to increase production. Such farmers will need to be supported with adequate infrastructure and institutional systems. Thus rising food prices may represent an important opportunity for promoting agricultural and rural development in many food deficit countries, provided an enabling policy environment and supportive measures are already in place or established quickly. In the longer term, however, climate change and water scarcity are expected to negatively affect food production. Without coordinated actions and adequate policy measures, these new developments will make achieving the Millennium Development Goals, in particular MDG1, even more challenging. Over the medium term, failure to act expeditiously may lead to a significant increase in the number of people in need of emergency as well as long-term assistance. Policy and investment responses by Governments and development partners need to be country and context specific and should address both immediate and long term challenges in a coherent and mutually reinforcing manner.

3.2.2 Implications of Volatility in International Fuel Prices

In the last two years international oil prices have been very volatile. They rose to an unprecedented level of USD 147 a barrel in mid-2008. Since July 2008, but fell to as low as USD 40 a barrel in the wake of the financial crisis. Fuel prices have since recovered and are expected to remain in the USD 70 – 80 range in the medium term. This volatility in oil prices is not favorable to smallholder farmers and those below the poverty line in Africa and other developing nations.

All the four case study countries are net oil importers, which makes them vulnerable to the volatility in oil prices. The high fuel prices increase the import bill, leading to deterioration in the trade balance, depreciation of the currencies and the balance of payment situation. Balance of payment deficits result in the loss of official foreign exchange reserves. In Kenya, foreign exchange reserves fell from USD 3.4 billion at the end of December 2007 (equivalent to 3.1 months of 2008 import cover) to USD 2.9 billion at the end of December 2008 (equivalent to 2.8 months of 2009 import cover). Other countries in the region experienced the same macroeconomic conditions that are not conducive to agricultural development.

The increase in the oil prices in recent times made some governments and investors to divert attention and limited resources to the production of crops for bio-fuel. This policy of promoting the production of crops for bio-fuels as against crop production needs to be re-examined in order not to displace food crops and push food prices higher (ODI, 2008a). However, as fuel prices have fallen sharply, the production of bio-fuel is less attractive and may reverse the growth in the production of crops for bio-fuel.

As stated above, the price of oil has fallen, but the supply challenges continue to deny consumers the benefits of low crude oil prices as local oil marketers pass on the high transport and operational costs to consumers. High oil prices lead to high energy,

transport and production costs, which farmers are not able to fully pass on to buyers, resulting in reduced profits to farmers. In addition, high fuel prices negatively impacted budget positions, which affected governments' capacity to cope with the financial requirements in economic and social sectors.

3.2.3 *Implications of the Global Financial and Economic Crisis*

Since the middle of 2008, the world has experienced the most challenging economic situation since the great depression in the 1930s. Africa has not been spared from the global financial and economic crisis. The continent's GDP growth declined from 6.1 percent in 2007 to 2 percent in 2009 (Kasenkende, *et al*, 2009). East Africa seems to have suffered less compared to other regions, with growth at about 5 percent in 2009.

In the context of the agriculture sector, both small and large-scale farmers have been affected by the global financial and economic crisis. However, smallholder farmers are less directly affected because they are less integrated into the world financial markets, and thus less exposed to the losses in the equity and financial markets as large scale farmers. At the same time, the large-scale farmers have a greater capacity to absorb the shocks, because their asset holdings are more diversified. In fact only a few large-scale farmers listed in some of Africa's stock exchanges had their share value dipped as the stock exchange markets lost value, especially in the second half of 2008.²⁴

But lack of exposure and access to international financial markets and emerging market chains (supermarkets, for example) prevented East African smallholders from realizing high income and achieving high productivity growth during booms. On the contrary, lack of exposure rescue them from the direct effect of the financial and economic challenges. The real question that emerges is whether smallholder farmers should not seek greater integration with the markets. The answer lies in the relative costs that smallholder farmers face in taking either decision. What has become clear, however, is that the global economic crisis may delay and even slowdown the escape of East African smallholder farmers from poverty. The crisis, with its resulting credit crunch especially for micro, small and medium-sized businesses, could lead to drying up of credit for smallholders, and thus limit their means to purchase inputs such as fertilizers, chemicals and seeds resulting into greater food shortages. The smallholder farmers thus suffer from second-round effect of the crisis, even in countries without direct exposure to global markets.²⁵

On a more positive note, the global financial and economic crisis as well as the food and fuel crisis have provided new opportunities for East Africa's agricultural

²⁴ All the agricultural companies listed on the Nairobi Stock Exchange (NSE), Kenya, including Kakuza Limited (Tea growing, livestock farming, horticulture, and forestry development); Rea Vipingo Limited (sisal production); Sasini Tea and Coffee Limited (Tea and Coffee); Williamson Tea Kenya Ltd (Tea); Kenya Orchards Ltd (fruits and vegetable); and Limuru Tea Company Limited (Tea) lost more than 30 percent value in 2008.

²⁵ As the export proceeds decline, the deposit base of the banks decreases, lowering the growth of credits. Lower inflows of remittances would have similar effect in the case of microfinance institutions.

development and poverty alleviation. On balance, the food, fuel and financial crises have triggered towards more coordinated responses of the governments, development partners, private sector and other stakeholders, focusing on rural development. The world has been forced to rethink its agriculture development approaches, including the role of subsidies to smallholder farmers. This recent development could revitalize agriculture in general and smallholder farming in particular.

4. OPPORTUNITIES IN EAST AFRICAN SMALLHOLDER AGRICULTURE

4.1 Investment Opportunities

The potential of agriculture and smallholder farming can be illustrated by the enhanced income generation in several East African agricultural export sub-sectors. In this context, Kenyan horticulture exports often serve as an example of agricultural export success in Africa. Horticulture constitutes one of the largest earners of foreign exchange in agriculture, with over 50 percent of proceeds being generated by smallholders.²⁶ According to Minot and Ngigi (2009), the key factors behind the Kenyan horticultural success were: (i) a real exchange rate aligned with its equilibrium value; (ii) macroeconomic stability; (iii) an enabling investment climate; (iv) solid infrastructure; (v) links with European markets, and (vi) deliberate efforts to facilitate cooperation between farmers and exporters. These factors were complemented by training and support for small-scale irrigation.

The lessons of the Kenyan success can be applied to other countries with similar agro-ecologies and production potential. Indeed, Ethiopia's exports of fruit and vegetables have also been increasing, with average annual growth during 2002 – 08 amounting to 24 percent. An example of the JJ Kothair Farm in Upper Awash area illustrates the ongoing transformation. For years the Farm has been producing vegetables for local markets, but it switched to exports in 2008 after being paired with Aurora Fresh, an international marketing company carrying out exports to the UK. The transition to exports was not costless, however. Among other investments and retraining, it required new packaging equipment and irrigation systems, to meet the quality standards of the overseas markets (USAID, 2009).

Successes in specific agricultural sub-sectors notwithstanding, overall agricultural productivity has remained low due to poor access of smallholder farmers to modern inputs, sub-standard infrastructure and, in some cases as in Ethiopia, government over-regulation of the sector. The lasting improvements thus require improved private sector participation, especially in agro-processing of export commodities such as tea and

²⁶ However, while smallholders involved in horticulture benefit from their niche, their number is too small to impact the overall agricultural sector (Minot and Ngigi, 2004).

coffee. Diversification into other non-traditional export crops is also needed. Investment opportunities exist in tea plantation and processing as well as packaging of tea for export. Similar opportunities exist in coffee processing and packaging for final products like instant coffee, growing of robusta coffee used in blending Arabica coffee, and manufacture of coal from coffee husk. The pyrethrum sub-sector portrays opportunities in seed production/plant propagation and investments in plantation.

African agricultural potential has not escaped the attention of foreign investors. The recent large scale land investments in Africa (including East Africa) are a case in point. These investments present opportunities for the transformation of farming in Africa through better irrigation infrastructure, jobs, and technology transfer and food security. In addition, these investments may benefit smallholder farmers through contract farming. However, the environmental impact factor of these new investments needs to be reviewed and factored into the of the agreements for such investments. The land investments also come with other risks and opportunities (Box 4.1).

Investment potentials exist for smallholder farmers in various areas of agricultural production and agribusiness, ranging from primary production and food processing to providing professional services. Furthermore, investment opportunities abound in support services such as establishing farm machinery and equipment plants; operating tractor hire centers; establishing training institutes and research centers; developing human and animal power technologies; operating agriculture mechanization centers; training of extension experts and agricultural researchers; establishing agricultural information centers and seed multiplication farms.

Box 4.1: Food Crisis and Foreign Direct Investment in Africa's Agriculture

Africa countries experience a decline in foreign direct investment in the last five years before the global spike in food prices. Following the surge in global food prices, some countries like United Arab Emirate, South Korea, United States of America, Japan, Saudi Arabia, China and United Kingdom etc. shopped for African countries with vast arable land to invest in agricultural production for export and to meet the domestic needs. A few examples of such investments in the case study countries are; In Ethiopia, British Sun Biofuels, a UK company recently acquires over 3,000 hectares to grow *Jatropha*, used for production of bio-diesel; Sekab, a Swedish company, planning to invest up to 400 million dollars in producing bio-fuels in Tanzania, using up to 2 million acres (about 809,400 ha); Egypt plans to grow wheat and corn on 840,000 hectares in Uganda; In 2008, the government of Qatar began negotiations with Kenya for a long-lease on 100,000 acres (about 40,500 ha). In the same vein, five multinational firms from the United States, Japan, and Britain applied in Kenya for land to cultivate crops such as *jatropha*, croton, sweet sorghum and sugar.

As noted by Castel and Kamara (2009), the investments are largely export-oriented and do not necessarily contribute to national food security objectives. This is especially true for biofuel projects in Tanzania or in cases where agreements are signed for the production solely for export to Saudi Arabia in Ethiopia. These large-scale land investments in Africa (including East Africa) have huge opportunity to inject funds into the region's highly staffed agricultural sector. These extensive acquisitions of land for agricultural purposes not only facilitate access to capital for smallholder as well as large scale farmers, but also attract technology, knowhow and markets. It also has potentials to bring macroeconomic benefits, such as GDP growth, employment creation, infrastructure development, improved government revenues and livelihood improvement in rural areas.

Though, these deals create opportunities, they also have some social and economic challenges that need to be handled with utmost care in order not to erode the benefits. The case of the large scale sugarcane production deal in the Wami River basin in Bagamoyo District by a Swedish company which will displaced about 1000 small-scale rice farmers on their lands without compensation as they have no title on the land is a good example. Another example is the pastoral land areas in Tanzania and Kenya, where seasonal grazing areas of pastoral populations is likely to be lost to foreign investors, putting their livestock and crop activities at risk.

Sources : (Castel and Kamara 2009; Collier and Dercon, 2009; Cotula, 2009; Cotsula *et al* ,2009; Morgan, 2009b; Oxford Analytical, 2009a; Oxford Analytical, 2009b and Sulle, 2009)

4.2. Other Opportunities for Revitalizing Smallholder Agriculture

Despite the constraints listed above, over the longer term smallholder agriculture presents numerous opportunities, which are highlighted below.

4.2.1 Rising Global demand

The increasing trend in global demand in developed as well as emerging countries, driven in part by population growth, has created opportunities for the expansion of smallholder agriculture. In particular, the demand in emerging countries, especially India and China where the population has doubled to an estimated 1.2 billion and 1.33 billion in 2009 from their respective numbers fifty years earlier, will provide opportunities for smallholder farmers to expand their production. Though India and China have been self-sufficient in food production until recently, inadequate cultivable land will make future imports of agricultural commodities inevitable.

Furthermore, smallholder agriculture is projected to be economically sustainable in the future because of expanding urban centers, rapid economic growth in most of the case study countries and the accompanying demand for more diversified products, mainly fruits and vegetables. As discussed above, markets for nontraditional exports such as horticulture have expanded recently. In addition, urbanization and rapid economic growth in Africa and many developing countries before the global financial crisis has pushed up consumers' purchasing power, generated rising demand for food, and shifted food demand away from traditional staples toward higher-value foods like meat and milk. This dietary shift is leading to increased demand for grains used to feed livestock (Von Braun, 2008). There is also rising demand for fruits, vegetables and more processed and precooked foods. However, with the increasing amounts of land being shifted out of agriculture, urbanization also poses a challenge in the studied countries.

4.2.2 Discovery of Mineral Resources

The recent discovery of mineral resources in some East African countries constitutes another opportunity for future expansion of production and productivity rise of smallholder farming. Specifically, in Tanzania, gas production started at the offshore Songo Songo natural gas fields in July 2004. In Uganda, oil has been found, while exploration has been in progress in Kenya. The export of oil and gas by East African countries is expected to raise income levels and thus also demand for food and other commodities.

4.2.3 Success Stories from other Developing Countries

The success stories in India, China, South Korea, and Vietnam (discussed above) where smallholder farming was the bedrock of the highly successful agricultural revolution give hope for a brighter future and a greater role for smallholder farming in East Africa in achieving the full potential for agricultural growth. Surprisingly, within less than three decades the story of Vietnam changed from a net importer of rice to the second largest exporter largely by Vietnamese smallholder farmers who constituted about 70 per cent of the rice farmers in the country. With these examples, there is a reason to believe that East African and indeed African smallholder farmers would be able to do the same given the similarity of agro-ecologies and existing opportunities.

4.2.4. Climate Change and Environmental Implications

Climate change and its environmental implications for large scale farming make it imperative to achieve optimal combinations of smallholder and large-scale farming. Since smallholder crop and livestock farms have less negative impact on the environment than large farms, raising their productivity on existing land would be environmentally friendlier than relying on large-scale production alone, which is often associated with environmental hazards, such as cutting down large trees. On the basis of environmental considerations, smallholder farming in environmentally sensitive areas should be encouraged, along with large farms elsewhere.

4.2.5. Market Information and Partnerships

During the past 20 years, there have been advances in cooperation between countries in Africa, both regionally and at the level of the African Union (AU), which have supported regional trade. Regional Economic Communities are committed to creating customs unions and common markets. As progress is made in this area, trade within East Africa and Africa generally has been increasing, although it is still well short of potential. In the immediate future, the main markets for African farmers are within Africa: they are large and growing faster than international markets for most agricultural commodities.

Moreover, the use of local radio, mobile phones and the internet, has increased the avenues for timely and wider delivery of useful market information (AfDB, UNECA, and OECD, 2009). Recently, Nokia in partnership with Kenya Meteorological Department launched a new service called “Nokia Life Tools” that will enable rural-based communities and persons living in small towns to receive regular updates on climatic changes; farm input and farm produce prices on their mobile phones. Estimated retail prices of the new devices range from 25 to 90 EUR (Ksh. 2,500 to Ksh. 9,000).

In addition to Nokia Life Tool, other major ICT-based initiatives in East Africa to provide fast and readily available flow of information are the SMS Sokoni, provided by Kenya Agricultural Commodity Exchange (KACE) and mobile operator Safaricom in Kenya and Busoga Rural Open Source Development Initiative (BROSDI) by the Women of Uganda Network (WOUGNET), (AfDB, UNECA, and OECD, 2009). All these new initiatives help empower smallholder farmers to make quick and informed decisions that will enhance their productivity.

4.2.6 Food Insecurity in East Africa

The food supply and demand gap and even chronic food insecurity persist in East Africa. Ethiopia, for example, suffers from structural food insecurity largely due to poor exchange of food across regions and may remain so for the foreseeable future. The government and international community intervene in Ethiopia through provision of food aid. However, the use of food aid should be reserved for only extreme humanitarian emergencies and should not be allowed to degenerate to an “aid dependency syndrome”, depressing local food prices and discouraging local production. Food aid therefore should be cut-off as soon as the immediate crisis is over. The best option in this context is to support local production of staples. This is yet another opportunity to be filled by smallholder agriculture. Nevertheless, given the various constraints and market failures that the sub-sector faces, well-targeted (and time-bound) government interventions may be needed, as was done in some other countries (Box 4.2).

Box 4.2: The case of Malawi Subsidy Program

In 2005, Malawi imported more than 300,000 tons of food to feed nearly 5 million people. Some of the causes of the food shortage has been drought and the poor crop harvests that the country has suffered for many years. However, in 2006 and 2007, the country produced a quantity of maize that exceeded the country's needs. Behind these record results is the Government of Malawi's fertilizer and seed subsidy program, introduced in 2005 and co-funded by the Department for International Development (DFID). Through the program, around 2 million households comprising of mainly **smallholder farmers** were able to buy fertilizer at the subsidized price of USD 6.5 per 50 kg bag (less than a third of the USD 27 per kg retail price), and make a saving of USD 2.80 on seed. For distribution, the Government used private sector agricultural dealers as well as state-owned outlets, enabling customers to choose, for the first time, where they bought from. This important step forward was made possible by DFID funding.

Although it is difficult to show the impact of individual factors on maize production, results from an independent evaluation suggest that the subsidy led to an additional 300-400,000 tonnes of maize being produced in 2006 and 600-700,000 tonnes in 2007. In 2008, Malawi had a maize surplus of 500,000 metric tonnes. These figures remove the impact that better than average rainfall may have had on the maize yield. The value of this extra production has, in 2007, been between USD 100 million and USD 160 million, which far exceeds the USD 70 million cost of the seed and fertilizer subsidy. In spite of the huge success already recorded, the government plan to further increase the country's food production through an ambitious irrigation project known as the "green belt" along lakes and major rivers that will help farmers harvest crop all year round instead of a single growing season. Donor support towards the program is increasing and its implementation is being refined to make it more targeted and effective.

Sources: (<http://www.dfid.gov.uk/casestudies/files/africa%5Cmalawi-harvest.asp>; Dugger, 2007; FAO and UNDP, 2008; and Masina, 2009).

4.2.7 Supermarkets, Contract Farming and Collective Action

Supermarket operators, which vertically integrate collection, distribution, and retail sale of food, are becoming increasingly important in East Africa. Most notably, supermarkets have a share of 20-30 percent of food sales in Kenya. The other three case study countries have supermarkets but with less share of food sale. In principle, the growing importance of supermarkets would make farmers more responsive to changes in prices and consumer tastes by linking customers and farmers more effectively. However, in practice supermarkets require uniform quality, minimum large quantities, consistency, and high standard of hygiene and timeliness of supply that can be difficult to meet for smallholder farmers. They may also require the ability to trace consignments back to the source to confirm how they have been produced (Hazell, 2005). Smallholder farmers, who are often undercapitalized and often undereducated, struggle to meet these requirements. These challenges are easily surmountable with good extension services, contract farming and collective action, as exemplified by the Eagle project in Uganda (Box 3.2). Training programs for farmers could also help.

Contract farming and collective action can help incorporate smallholders in high-value supply chains that require specialized inputs and sell to markets for specialized

outputs.²⁷ However, of critical importance is awareness of and compliance with standards for high-value products. If well-utilized, stronger linkages of smallholders with supermarket chains are likely to improve marketability and profitability of their products. In this regard, East African countries can draw on experiences of other countries. For example, evidence from Madagascar suggests lessons on how smallholder farmers can benefit from the emerging retail networks. In Madagascar, one of the poorest countries in the world, small-scale farmers that produce vegetables for supermarkets in Europe receive assistance and supervision through contract mechanisms, which help them meet the complex quality standards of the European markets. As documented in Minten *et al.* (2009) "...the number of farmers of vegetables for exports has grown in Madagascar, despite major disadvantages of geography, bad local infrastructure, low rural education levels, and high compliance and transaction costs..." Authors conclude that given the right incentives and contracts, small farmers in Africa can benefit from the emerging supermarket chains.

Madagascar's experience seems to illustrate contract farming at its best. As Gou, *et al.* (2007) claim:

... contract farming provides a means to manage complex production processes with greater precision ... This can result in higher quality, safer food with lower production and marketing costs....contracting can overcome imperfections in input and output markets or institutional deficiencies by providing credit, seeds, machinery services, human capital and market access to farmers.

Competition among contractors is a key precondition for the system to work. In the context of East Africa, Uganda's Nile Breweries Eagle Project is an example of an effective use of contract farming (Box 3.2).

²⁷ Contract farming is an arrangement where the farmer produces and supplies a specific agricultural product and the entrepreneur buys it at an agreed price. Well-aligned incentives and monitoring system are preconditions for the arrangement to work (SIDA, 2006).

Box 3.2: Contract Farming: Nile Breweries Eagle Project, Uganda

The Eagle Project launched by Nile Breweries in 2002 involves the cultivation and harvesting of Epuripur sorghum by local farmers for production of low cost, high quality beer by Nile Breweries, which will ensure a cycle of sustainability for all partners involved. The main partners involved are Nile Breweries Ltd, Afro-Kai Ltd. – seed commodity broker and Ugandan farmers and their families.

Nile Breweries is the manufacturer of Malt and Beer Afro-Kai Limited is a private limited company incorporated in 1984, in agriculture commodity trade business. The mission of this company is to ensure processing and supply of production in order to satisfy expectations and needs of customers. Afro-Kai Limited provides variety and quality of grains produced through partnership with smallholder farmers through application of modern technologies. Afro-Kai is in charge of coordinating production which requires identification of areas that are suitable for production and provides easy access for transport. Other intervention like selection of farmer, arrangements for the ordering and supply of inputs and provision for farmer credit seems important challenges for the company.

Nile Breweries through Afro-Kai, their sorghum agent, distributes Epuripur Sorghum seeds, a local species of sorghum to farmers in Apac, Lira, Masindi, Oyam and Soroti districts. The farmers after harvest supplies Nile Breweries Limited the Epuripur Sorghum for the production of low cost, high quality Eagle Extra and Eagle Larger beer by Nile Breweries Limited which will ensure a cycle of sustainability for all partners involved.

Through establishment of an out-growers' scheme, Nile Breweries and Afro-Kai played a key role in grains marketing, where smallholders were effectively linked to the market. The project enhances more confidence of the financial institutions to support Uganda's farmers. The farmers also benefits from the extension services through farmer training programs and provision of technical advice on all aspects of crop management. The farmers involved in the scheme were guaranteed stable prices and were sure of regular and predictable income. This has enabled them to send their children to school and buy medical care and food. More than 8,000 farmers from 26 districts are involved in the growing of Epuripur sorghum with harvest in excess of 6,000 metric tones per annum, which injects of over USD 2 million each year into the rural economy in Uganda and creates jobs and wealth for Uganda farmers.

Sources: (Balya, 2007; Nile Breweries, 2009; and Odomet, 2009)

5. CONCLUSIONS

Revitalizing the agricultural sector, and in particular smallholder agriculture, is a precondition for achieving high and sustainable growth, poverty reduction and food security in East Africa. Despite its enormous potential, however, the performance of agriculture (including smallholders) has so far been disappointing. Recent growth acceleration in Ethiopia and a few successful sub-sectors in other studied countries notwithstanding, contributions of smallholder farming, and agriculture in general, to the region's recent rapid growth during 2005 - 08 have remained limited. The sector has so far failed to provide the basis for development, including through industrialization, in spite of a series of reform attempts undertaken in these countries.

This study concludes that concerted efforts of all stakeholders, including governments, NGOs, and development practitioners are needed to remove the existing bottlenecks to productivity growth in smallholder agriculture and progress with the region's

development agenda. Research reviewed in this study suggests that given the interdependent constraints that amplify each other, several measures need to be implemented jointly for the reforms targeted at the smallholder sub-sector to succeed this time around. In particular, improving land property rights and access to land, increasing access of farmers to credit, providing appropriate incentives for the market mechanism to work, and encouraging farmers' training so they are more inclined to use modern methods of production are key. Other ongoing efforts, in particular improving infrastructure, also play an important role, as the recent increase in agricultural productivity in Ethiopia illustrates. Reforms to the smallholder sector need to be complemented by the development of commercial farming to achieve high and sustainable increase in agricultural productivity.

One of the critical lessons from the Asian "Green Revolution" is that sustained agricultural growth cannot be achieved by markets alone. The East African governments have a key role to play in revitalizing smallholder farming and transforming smallholder farmers from subsistence to commercial agriculture. They must create an enabling environment conducive for agriculture in general, and smallholders specifically, which requires stepping up the budgetary allocations to agriculture in line with the Maputo declaration. This would ease implementation of policy and regulatory improvements, development of infrastructure, environmental protection, and secure property rights. Governments also need to ensure that the ministries of agriculture are performance driven. Moreover, productivity gains through innovation and technology adoption can be facilitated through farmers' training. This ensures that the farmers have the required skills for production of commodities that meet the quality standards that will allow them to compete on domestic and international markets. The input and output markets also cannot be completely left to the private sector. Given the poor infrastructure and imperfect information, governments may need to intervene to ensure that farmers have access to input and output markets through provision of market information and innovative adoption of technology, such as mobile banking in Kenya.

The African Development Bank and other development partners also play valuable roles in helping develop the agricultural sector, including smallholder farming, in East Africa. In addition to funding, the Bank encourages East African countries to adopt preventive measures against food crisis, including through mobilizing resources. In the broader development context, the Bank promotes regional integration for enhanced trade and investment flows, supports mechanisms that prevent conflicts, and facilitates their early resolution. Finally, through policy discussion with its RMCs, the Bank identifies the best practices for adoption by individual countries, tailored to their specific circumstances.

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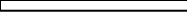
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