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DSGD DISCUSSION PAPER NO. 9

**SMALLHOLDER AFRICAN AGRICULTURE:
PROGRESS AND PROBLEMS IN
CONFRONTING HUNGER AND POVERTY**

Danielle Resnick

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July 2004

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OVERVIEW

In contrast to uniformly pessimistic assessments about Sub-Saharan Africa's (hereafter Africa) ability to meet the Millennium Development Goals (MDGs), this paper examines recent trends in poverty, malnutrition, and growth to delineate where the challenges are the greatest within the entire region and sub-region and to highlight informative cases of success in specific countries. The performance of agriculture, especially smallholder agriculture, receives particular attention due to its role in sustaining the livelihoods of a majority of Africa's poor. In recent years, the importance of smallholder agriculture has been greatly recognized, demonstrated by both African governments and the donor community pledging to engage in the requisite interventions for generating agricultural growth. By seizing on this new enthusiasm and learning from case studies of smallholder successes, agriculture could significantly contribute to Africa's ability to meet the MDGs.

SMALLHOLDER AFRICAN AGRICULTURE: PROGRESS AND PROBLEMS IN CONFRONTING HUNGER AND POVERTY

Danielle Resnick *

I. BROAD TRENDS IN AFRICA

Currently, Africa is far from achieving the two targets constituting the first MDG: halve between 1990 and 2015 both the proportion of people living below \$1 dollar a day and the proportion of people who suffer from hunger. Indeed, Africa not only has the world's highest proportion of its population living below the international poverty line but also experienced an increase in this proportion from 47.4 percent in 1990 to 49 percent by 2000 (World Bank MDG database). Meeting the first MDG target requires Africa to achieve an annual GDP growth rate of 7 percent (AfDB 2003). Yet, according to **Table 1**, only 10 out of 37 African countries have achieved a 5 percent or higher average GDP growth rate between 1997 and 2003. As a whole, Africa is growing at about 3 percent and if it continues according to this trend, projections indicate that 42.3 percent of the population will remain in poverty by 2015 rather than the target of 23.7 percent (World Bank MDG database).

Likewise, at 33 percent, Africa has the world's highest percentage of undernourished people, and this proportion has only improved by 3 percent since 1990. Children are particularly vulnerable with an average of 24 percent underweight and 35 percent stunted by 2000 (UNSCN 2004). As **Table 2** shows, the percentage of children underweight or stunted is higher in the rural than the urban areas in all countries for which recent data is available.

Considering that agriculture is the primary source of livelihood for approximately 65 percent of Africans, represents between 30 and 40 percent of African GDP and

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accounts for almost 60 percent of Africa's export income, reducing these high levels of poverty and hunger in Africa will require greater agricultural and rural development (IFAD 2003). More specifically, this agricultural growth must be centered on the small farmer since small-scale farms account for over 90 percent of Africa's agricultural production and are dominated by the poor (Spencer 2001). According to the MDG's Hunger Task Force, smallholder-farming systems also contain 75 percent of Africa's underweight children (Millennium Project Task Force 2004).

On an aggregate level, however, progress at promoting smallholder growth over the last decade has been elusive. Although per capita agricultural incomes have slightly improved, reaching \$163 by 2002 compared with \$151 in 1990, both per capita agricultural and food production remains at their 1990 level. In fact, food insecurity remains a major problem, requiring shipments of over 3 million market tons of cereal food aid in 2002 and resulting in food emergencies in 24 African countries by early 2004 (FAOSTAT; FAO GIEWS).

These trends reflect the cumulative legacy of multiple, well-known factors. Among many others, they include low land productivity, inadequate rural infrastructure, vulnerability to natural disasters, inappropriately designed or partially implemented structural adjustment programs, and high levels of insecurity. In fact, most of the countries in **Table 1** with the lowest average GDP growth rates between 1997 and 2003, including Burundi, Côte d'Ivoire, the Democratic Republic of the Congo, Guinea-Bissau, Sierra Leone, and Zimbabwe have experienced civil conflict, border wars, and/ or extreme political instability during the same period. In addition, Africa is plagued by a high prevalence of HIV/AIDS, which, among other things, decreases labor productivity, erodes assets, and blocks the transfer of knowledge from one generation to the next. According to the FAO, the pandemic has already reduced national economic growth rates across Africa by about 2 to 4 percent a year (FAO 2003).

Table 1: Comparison of Annual GDP Growth Rates Across Countries and Sub-Regions

Countries & Sub-Regions	1997	1998	1999	2000	2001	2002	2003	1997-2003
Africa	3.9	2.4	2.7	3.2	3.7	3.5	3.5	3.3
Angola	7.9	6.8	3.3	3	3.2	15.3	4.5	6.3
Botswana	6.7	5.9	5.5	7.5	5.2	3.9	5.4	5.7
Lesotho	4.8	-3.5	0.5	1.9	3.3	3.8	3.9	2.1
Malawi	3.8	3.3	4	1.1	-4.2	1.8	4.4	2.0
Mozambique	11.1	12.6	7.5	1.5	13	7.7	7	8.6
Namibia	4.2	3.3	3.4	3.5	2.3	3.3	3.7	3.4
South Africa	2.6	0.8	2	3.5	2.7	3.6	1.9	2.4
Swaziland	3.8	3.3	3.6	1.9	1.7	3.6	2.2	2.9
Zambia	3.3	-1.9	2.2	3.6	4.9	3.3	4.2	2.8
Zimbabwe	1.4	0.8	-4.1	-6.8	-8.8	-12.8	-13.2	-6.2
Southern Africa	5.0	3.1	2.8	2.1	2.3	3.4	2.4	3.0
Benin	5.7	4.6	4.7	5.8	5	6	5.5	5.3
Burkina Faso	6.8	8.5	3.7	1.5	5.9	4.4	6.5	5.3
Cameroon	5.1	5	4.4	4.2	5.3	6.5	4.2	5.0
Central African Rep.	7.5	3.9	3.6	1.8	1	-0.8	-5.8	1.6
Chad	4.2	7.7	2.3	1	9.5	9.9	10	6.4
Congo, Rep.	-0.6	3.7	-3	8.2	3.6	3.5	0.8	2.3
Cote d'Ivoire	5.7	4.8	1.6	-2.3	0.1	-1.6	-3.8	0.6
Gabon	5.7	3.5	-8.9	-1.9	2	0	2.8	0.5
Gambia	4.9	6.5	6.4	5.5	5.8	-3.2	8.7	4.9
Ghana	4.2	4.7	4.4	3.7	4.2	4.5	4.7	4.3
Guinea	5	4.8	4.6	1.9	3.8	4.2	2.1	3.8
Guinea-Bissau	6.5	-27.2	7.6	7.5	0.2	-7.2	-1.2	-2.0
Mali	6.1	8.7	3	-3.2	13.3	4.4	3.2	5.1
Mauritania	2.8	3.9	5.2	5.2	4	3.3	4.2	4.1
Niger	2.8	10.4	-0.6	-1.4	7.1	3	4	3.6
Nigeria	3.2	0.3	1.5	5.4	3	1.5	10.6	3.6
Senegal	5	5.7	5	5.6	5.6	1.1	6.3	4.9
Sierra Leone	-17.6	-0.8	-8.1	3.8	5.4	6.3	6.5	-0.6
Togo	3.5	-2.3	2.4	-0.8	-0.2	4.6	3.1	1.5
West Africa	3.5	3.0	2.1	2.7	4.5	2.7	3.8	3.2
Burundi	0	4.7	-0.9	-1.1	2.2	4.5	-0.5	1.3
Congo, Dem. Rep.	-5.6	-1.6	-4.3	-6.2	-2.1	3.5	5	-1.6
Ethiopia	4.7	-1.4	6	5.4	7.7	1.2	-3.8	2.8
Kenya	2.1	1.6	1.3	-0.1	1.2	1	1.5	1.2
Madagascar	3.7	3.9	4.7	4.8	6	-12.7	9.6	2.9
Rwanda	13.8	8.9	7.6	6	6.7	9.4	0.9	7.6
Tanzania	3.5	3.7	3.7	5.6	6.1	6.3	5.5	4.9
Uganda	5.1	4.7	7.9	5.4	5.3	6.7	4.9	5.7
East Africa	3.4	3.1	3.3	2.5	4.1	2.5	2.9	3.1

Notes: Highlighted countries are closest to the 7 % GDP growth rate needed to achieve the MDGs.

Source: IMF World Economic Outlook Database, 2004

Table 2: Comparisons of Malnutrition Across Countries

	<i>Calories</i>	Children Underweight (%)			Child Stunting (%)		
		<i>National</i>	<i>Urban</i>	<i>Rural</i>	<i>National</i>	<i>Urban</i>	<i>Rural</i>
Southern Africa							
Angola	1900	32.4	29.7	32.4	45.2	43.3	49.6
Botswana	2270	12.5	11.5	13.6	23.1	23	23.1
Lesotho	2310	17.9	13.3	18.9	45.5	39	47
Malawi	2170	25.2	12.9	27.3	49	34.2	51.3
Mozambique	1950	26.1	20	28.2	35.9	27.3	38.9
Namibia	2700	26.2	17.6	29.9	28.5	21.8	31.4
South Africa	2890	8.5	9	14	24.9	19.8	30.1
Zambia	1900	27.9	23.4	30.3	46.8	36.7	51.3
Zimbabwe	2100	13	7.5	15.6	26.5	20.6	29.2
West Africa							
Benin	2480	22.9	17.9	25.4	30.7	24.4	33.9
Burkina Faso	2460	34.5	22.3	36	36.8	22.7	38.8
Cameroon	2240	20.0	14.3	25	29.3	22.3	31.8
Central African Rep	1960	22	22.4	23.6	23.5	26.2	29.7
Chad	2150	38.2	26.4	28.5	29.1	25.5	30
Côte d'Ivoire	2830	23.6	13.2	25.1	25.1	18.2	28.6
Gabon	2580	12.2	10	16.8	20.7	17.4	28.9
Gambia	2280	24.7	9	21	19.1	13.2	22.3
Ghana	2620	24.1	15.6	27.9	25.9	14.3	29.7
Guinea	2330	19.1	22.4	37.4	40.9	31.4	46.9
Mali	2370	34.2	20.2	37.1	38.2	24	42.5
Mauritania	2730	32.6	26.7	35.9	34.5	30.2	37.9
Niger	2130	40.4	29.9	41.7	39.7	26.3	41.8
Nigeria	2770	29.2	26.7	27.7	33.5	24.6	27.3
Senegal	2280	23.3	15.4	26.4	25.4	18.9	28.7
Togo	2310	24.4	16.1	27.9	21.7	14.8	23.9
East Africa							
Burundi	1610	43.1	21.5	46.9	56.8	33.3	58.6
Congo, DR	1570	34.4	23	38.6	45.2	28.1	51.9
Eritrea	1670	39.6	29.1	44.9	37.6	27.9	42.5
Ethiopia	1910	46.5	33.9	48.7	51.5	42.2	52.6
Kenya	2040	21.6	13.3	23.9	33	24.7	34.7
Madagascar	2070	40	35.6	41	48.3	44.6	49.2
Rwanda	2000	28.3	15.3	25.9	48.1	27.4	45.3
Tanzania	1970	29.4	20.6	31.4	43.8	26.1	47.6
Uganda	2470	23.6	12.4	23.6	39.1	26.5	39.9

Note: Percentages are for children under 5 years old, except for Cameroon, Madagascar, and Togo where the percentages are for children under 3 years old. Children are classified as "underweight" or "stunting" if they fall below two standard deviations below the mean for the international reference group. Data are for the most recent year available for each country.

Source: FAO/FIVIMS and World Health Organization

Seizing Market Opportunities

Despite these downward trends, there is considerable potential for Africa to increase agricultural growth and alleviate hunger and poverty. Contrary to the pessimism expressed in some quarters, adequate market opportunities exist that have yet to be fully exploited and that could support more rapid and sustained agricultural growth in Africa. Staple foods represent a promising domestic market opportunity, particularly because Africa is not only a net importer of many staple foods but also because projections show that continent-wide demand for human consumption and livestock feed will double by 2015, adding another \$50 billion per year to effective demand (IFPRI 2002). Many African farmers are well positioned to compete in these staple markets. There is also some scope for increasing traditional agricultural exports (e.g. coffee, tea, cocoa, cotton and sugar) but primarily through trade negotiations as well as through improving quality and capturing niche markets, such as organics (Diao *et al.* 2003). While there is limited small farm involvement in non-traditional exports (e.g. fruits, flowers, vegetables and some processed foods), which precludes this sector from raising incomes and reducing poverty on the scale required in most countries by 2015, they have the fewest demand constraints and remain the most profitable option. Moreover, growing urban markets in Africa are increasing the demand for more diverse and higher value-added foods, thereby offering new opportunities for many African farmers.

Overall, there appears to be room for significant growth in agricultural sales if African small farmers can become progressively more competitive along the entire supply chain. For example, establishing a uniform system for grading and controlling the quality of agricultural products would go a long way toward sharpening Africa's competitive edge in global markets. In addition, reducing the exorbitant marketing margins created by transportation and transaction expenses would substantially lower food costs and raise producer incomes. Reducing these margins involves improvements in road and transportation networks, increased access to market information systems, and enhanced coordination and contractual arrangements among farmers, traders, and buyers. An added advantage is that these investments in rural infrastructure and market

development would facilitate links with the non-farm sector, stimulating overall income and employment in both rural and urban areas and leading to additional demands for agricultural products.

Moreover, many African countries possess a comparative advantage in those commodities imported by other African countries. By reducing their trade barriers in both the agricultural and non-agricultural sectors, African countries can increase intra-regional agricultural trade by more than 50 percent (Diao and Yanoma, 2003). Intra-African trade can also increase food security by facilitating the transfer of production from high potential agro-ecological zones to areas with structural food deficits. In some cases, such as southern Tanzania and northern Mozambique, these high potential areas may be better integrated with markets in neighboring countries than domestic ones. Since cross-border exports may not be subject to the same level of stringent quality standards required for international markets, intra-African trade might be more accessible to smallholders (Peacock *et. al.*, 2004). Greater cross-border trade in food staples could also help stabilize food supplies and prices at sub-regional levels in drought years.

As an example of the potential growth opportunities that exist in African agriculture, economy-wide simulations conducted by IFPRI reveal that if food (livestock and grain) and exportable goods (traditional and non-traditional) grow at 1.5 percent and 6 percent per year, respectively, while productivity in manufacturing and service sectors grows at 4 percent per year, then despite markets clearing at lower prices, per capita agricultural income grows at 2.97 percent per year, per capita food consumption grows by 2 percent per year, and per capita agricultural exports grow by 5.7 percent per year (Diao *et al.* 2003).

Strengthening Pan-African Commitment

Although intra-African trade is still a small proportion of total African trade, the value of a sub-regional approach to trade has long been recognized. The 1991 Abuja Treaty advocated consolidation of tariff and non-tariff barriers, strengthening sectoral integration at the continental level, and strengthening the existing sub-regional economic

groups and establishing new ones where necessary. More recently, there have been important developments in many of Africa's sub-regional economic communities (RECs) that offer great promise (These are discussed in more detail below). Despite the continuing challenges facing these RECs, they promote greater intra-African trade and provide a means for countries to pool resources, take advantage of economies of scale, and ultimately achieve the capacity to be a competitive force in the global market (Mutasa, 2003).

The sub-regional focus promoted by RECs will also be integral to the workings of the New Partnership for Africa's Development (NEPAD). Established in 2001, NEPAD offers an important forum for generating pan-African consensus and action to achieve development goals. Since agriculture is one of NEPAD's five focus areas, the organization launched in 2002 the Comprehensive Africa Agriculture Development Program (CAADP), which concentrates on land and water reclamation and management, infrastructure and markets, food production and hunger reduction, and institutional capacity building (FAO and NEPAD, 2002). Recognizing the decline in public expenditures on agriculture, African Heads of State and Government pledged in 2003 to allocate at least 10 percent of their national budgets to implement the CAADP and expressed their desire to achieve throughout the continent a six percent annual growth in the agricultural sector over the next 20 to 25 years. Since then, a number of NEPAD member countries have increased the level of national contributions to the sector and offered tax and other incentives to attract private investment to agriculture (FAO 2004).

Sustaining International Support

The efforts of African governments to revitalize smallholder agriculture need to be supported by the international community. Encouragingly, the major conferences following the Millennium Summit have echoed commitment to the goal of slashing hunger and poverty and have acknowledged the significant role of agriculture in achieving this goal, which indicates that this is not just a passing fad within the development community. Participants at the *World Food Summit: Five Years Later* in June 2002 called for an increase in funding in both donor and African national budgets

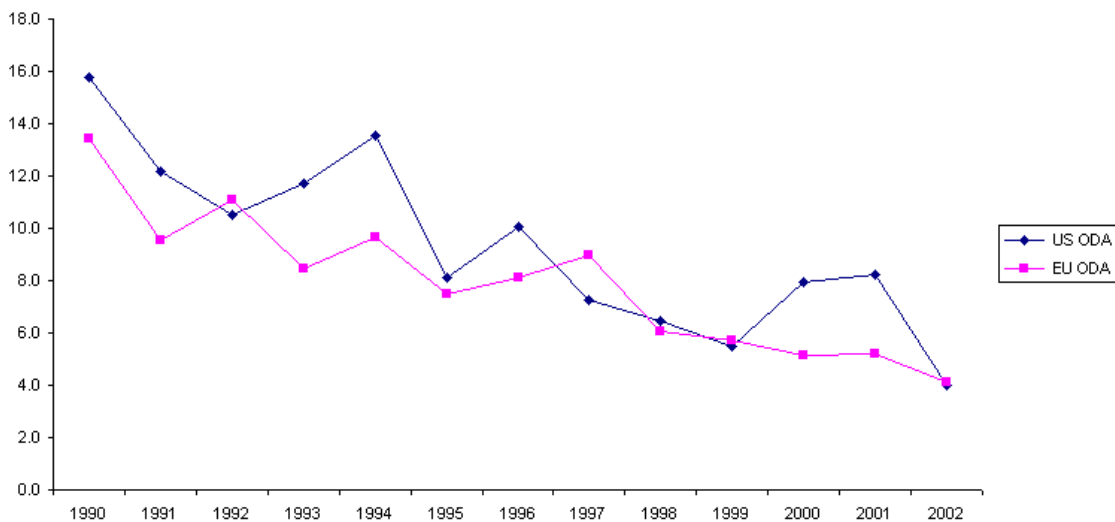
for agricultural and rural development. At the *World Summit on Sustainable Development* in August/ September 2002, it was once again echoed that agriculture plays a significant role in providing equitable development (IFAD 2003). In April 2004, an IFPRI-organized conference *Assuring Food and Nutrition Security in Africa by 2020* brought together three African Presidents as well as government officials, researchers, members of the business community, and representatives of multilateral and bilateral development organizations to examine the progress and remaining challenges to achieving food and nutrition security in Africa by the year 2020. Approximately 61 percent of conference participants stated that they believed food security can be attained in Africa by 2020, and almost 92 percent claimed that they were even more committed to the goal at the end of the conference than they were at the beginning.

In addition, key bilateral donors, including the Canadian International Development Agency (CIDA), the Department for International Development (DFID), and the US Agency for International Development (USAID) have developed extensive agricultural and rural development programs. Yet, the levels of financial support to African agriculture remain disappointing. Indeed, even though overseas development assistance (ODA) from members of the OECD's Development Assistance Committee (DAC) has increased to Africa, their ODA to African agriculture has fallen. Specifically, ODA to Africa from the United States increased from 1.5 billion USD in 2000 to 2.3 billion USD by 2002. However, **Figure 1** shows that the share allotted to African agriculture decreased from 8 to 4 percent during the same period and was overshadowed by the amount dedicated to both emergency and non-emergency food aid. Although the EU devotes more money to agriculture than to food aid, member states have demonstrated a similar tendency to allocate more money to Africa over the past few years but less to the agricultural sector.

In addition to increasing ODA allocations, Africa's agricultural sector needs greater access to international markets. Existing efforts towards this goal include the United States' African Growth and Opportunity Act, which provides duty- and quota-free access to US markets for almost all products. Currently, 38 African countries are deemed

eligible for AGOA benefits because of their commitment to economic and political reforms (ITA). The European Union, which constitutes Africa’s largest export market, established in 2001 the Everything But Arms (EBA) Initiative, which also grants duty- and quota-free access to the imports of all products, excluding arms and munitions, from the least developed countries (LDCs) without the LDCs having to give preferential access to the EU in return (Hinkle and Schiff, 2004). Since Africa officially contains 33 LDCs, the region is a major target of the EBA. Unlike other arrangements, such as the Cotonou Agreement, one of the major benefits of the EBA is that it does not have a time limit (Brenton 2003).

Figure 1: Percent of ODA to Africa Allocated to Agriculture



Source: Calculations based on data from the OECD Creditor Reporting System

Nevertheless, the impact of these arrangements has been limited for a number of reasons. First, AGOA and EBA circumscribe the number of beneficiaries because of their restrictive rules of origin. Also, while AGOA accounted for 55 percent of the United States’ imports from Africa in 2003, only about 8 percent of these AGOA imports were agricultural products while the majority were petroleum and textile/apparel imports. Moreover, most of the AGOA imports are concentrated among only a few countries, such

as South Africa, Nigeria, Equatorial Guinea, and Angola (Robinson-Morgan 2004). Likewise, studies have shown that most African LDCs continue to access the EU through the Cotonou Agreement, which offers special tariff-rate quotes for particular commodities, rather than through the EBA. Furthermore, EBA stipulates that full liberalization of tariffs on bananas, rice, and sugar, three of the most important export commodities for Africa, will not occur until the latter half of the decade (Brenton 2003).

In addition, the US, EU, and other members of the OECD offer huge subsidies to their domestic producers that counteract the potential benefits of preferential trade agreements. For all OECD countries, subsidies total approximately \$330 billion and in the US alone, subsidies under the Farm Bill equal \$15-20 billion per year, exceeding the value of Africa's total annual agricultural exports (World Bank 2003; FAO/ NEPAD 2002). Further negotiation during the current Doha Round of the World Trade Organization (WTO) on subsidy reform is crucial in order for Africa to benefit from world market integration. In fact, IFPRI model projections reveal that if both the United States and the European Union fully opened their markets and eliminated agricultural subsidies, Africa's total agricultural exports would increase by 20 percent, and the region's total agricultural income would increase by 5.7 percent (Diao and Yanoma, 2003). These projections only reflect the benefits from short-run adjustments in prices, production and consumption. Creating a more favorable market environment can also be expected to induce more private investment, thereby leading to longer-term productivity growth in African agriculture and offer even larger long-term benefits.

II. DELVING DEEPER INTO AFRICAN TRENDS

Since the continent consists of numerous countries with a wide range of natural endowments, historical and cultural experiences, and political and economic structures, Africa-wide averages obscure sub-regional and country level successes and challenges. A sub-regional assessment not only provides a more detailed and instructive view of agricultural-related developments but also complements efforts, such as NEPAD's, to promote agricultural growth through taking advantage of economies of scale and spillovers across countries.

Southern Africa

The Southern Africa region possesses a number of unique characteristics, including high urbanization rates, wide income disparities, a historical bias towards mineral exports, and the world's highest rates of HIV/AIDS. Despite containing less than 2 percent of the world's population, it contains 30 percent of all people living with HIV/AIDS worldwide (FAO 2003). Moreover, fertilizer application rates have decreased in almost every country while irrigation rates as a percent of cropland remain lower than the African average, ranging from 0.3 to 3.5. Along with a number of other compounding factors, these qualities have contributed to stagnant land productivity and falling labor productivity (Pardey *et. al* 2003).

Southern Africa is also the sub-region where agriculture as a share of GDP is the lowest, equaling only about 16 percent of GDP by 2002, even when South Africa is excluded. At 2 percent, average agricultural growth over the last six years is not far below the African average of 2.9 percent during the same period but, it remains lower than that achieved in the other two sub-regions. However, at \$183 by 2002, per capita agricultural incomes are higher than the African average and have slightly increased in the sub-region over time. Incomes are much higher in Botswana, Namibia, South Africa, and Swaziland while much lower in Angola, Malawi, Mozambique, and Zambia.

Combined with bad weather, poor infrastructure, and ineffective macroeconomic policies in some countries, the region's low food production and agricultural productivity culminated in the 2002-2003 famine, during which almost 14 million people faced starvation. More recently, high rainfall has helped the region recover and an increase in cereal production reduced the expected amount of food assistance during the 2003-2004 year. Yet, drought persists in Lesotho and Swaziland while flooding in Angola, Zambia, Botswana, Zimbabwe, and Mozambique has damaged crops. In addition to weather, food security in Angola is affected by the integration of internally displaced peoples (IDPs) and ex-UNITA soldiers and in Zimbabwe by eroding purchasing power caused by escalating inflation due to political instability (FAO GIEWS).

Notwithstanding these trends, expanding market opportunities offer promise about the growth prospects for the region in general and for smallholders in particular. For instance, many South African supermarket chains are sourcing fruits and vegetables from African countries rather than importing from overseas. Some are also providing technical assistance to local producers and participating in schemes that help small farmers better supply food retailers. For small farmers, the benefits of this arrangement include receiving good profits from a stable market while simultaneously being compelled to improve the quality of their outputs. Yet, in order for smallholders to be better integrated into the emerging supermarket distribution system, greater effort is needed to reduce transaction costs and improve efficiencies along the supply chain. By enhancing the logistical mechanisms of supermarket procurement, Africa's markets could become less fragmented and thereby allow for greater intra-regional trade (Weatherspoon and Reardon, 2003).

Already, the market value of intra-Southern African trade exceeds that of the region's trade with the rest of Africa (Diao *et. al.* 2003). This trade is facilitated by organizations such as the Southern African Development Community (SADC) and the Southern African Customs Union (SACU). In 2000, SADC members signed a Free Trade Protocol, which is projected to help trade grow significantly, especially between South Africa and the less developed SADC members of Malawi, Mozambique, Tanzania,

and Zambia (COMESA 2003). Although still low at 8.8 percent, intra-SADC trade as a percentage of SADC's total exports has almost tripled between 1990 and 2002 and will probably continue to grow as SADC aims to establish a Free Trade Area by 2008 (UNCTAD).

SADC is also beginning to grapple with the complex intellectual property rights and safety issues related to biotechnology adoption. All SADC members have agreed to develop national technology policies and establish national biosafety regulatory systems. They also recently adopted common guidelines for regulating GM crops and for building both the capacity and awareness to make decisions on other GM issues (Balile, 2003). In South Africa, which remains the only African country to use GM crops for commercial purposes, smallholders are experiencing the benefits of this technology. In Kwa-Zulu Natal, smallholders recently adopted *bacillus thuringiensis* (Bt) cotton as a more effective, lower cost and environmentally benign way of controlling pests than chemical spraying. Findings show that the average yield per hectare and per kilogram per seed was about 33 percent higher than for traditional seed varieties. Even though the cost of Bt seeds is higher, the cost is outweighed by the increase in yields and the reduction in chemical application costs. Thus, the gross profit margins are 31 percent higher for adopters than for non-adopters (Beyers and Thirtle, 2003).

Other forms of modern plant breeding have proved equally valuable. For instance, in Zambia and Malawi, disease and pest-resistant varieties of cassava that require few purchased inputs and can double yields with the same amount of labor and land have increased production by an average annual growth rate of between 6 and 8 percent per year. Smallholders dominate cassava production and those who market their crops have doubled their cash returns while subsistence farmers have enjoyed increased food security (Haggblade and Zulu, 2003).

The impact of technology and trade developments on poverty reduction among smallholders will vary according to country-specific conditions. In Zambia, for instance, poverty has actually increased over the past 30 years with 58 percent of the population living below the national poverty line. According to IFPRI model projections, the

country will not halve poverty until 2040 if it continues at its current annual per capita GDP growth rate of 1.8 percent (Thurlow, 2004). High inflation, erratic exchange rate movements, steep interest rates, heavy dependence on copper exports and foreign aid, and incomplete implementation of structural reforms partially account for the country's economic stagnation. There are also problems specific to the agricultural sector. Approximately 73 percent of the country's 5.6 million small-scale farmers are living in poverty (CSO, 1998). They are hindered by poor infrastructure, a lack of agricultural finance and credit, weak access to land and other agricultural inputs, and inadequate irrigation systems. Recent droughts and the HIV/AIDS pandemic have exacerbated their situation (AfDB 2003). Consequently, IFPRI projections indicate that in order to halve poverty by 2015, Zambia requires an 8.4 percent annual GDP per capita growth rate, which can only be achieved through balanced growth across all sectors of the economy. Given current circumstances, the ability of agriculture to contribute to this growth rate will depend on significant improvements in infrastructure and market development (Thurlow, 2004).

One example of the private sector assisting with market development is in seed cotton production, which has increased fivefold in Zambia from 20,000 to 100,000 metric tons between 1995 and 2002 (Voest 2002). Cotton has become the main cash crop for smallholders, who produce over 98 percent of the country's cotton. The productivity of Zambia's smallholder cotton farmers is higher than the average for Africa with many achieving yields of 1200 kilograms per hectare compared with the African average yield of 825 kilograms per hectare. Much of the increased production can be attributed to the private cotton firms providing agricultural credit for smallholders by deducting the costs of inputs from farmers' earnings at the time of sale (Grovereh *et. al*, 2000). In the medium term, smallholder production may be boosted even more as African countries demand locally grown cotton to produce and export garments to the United States under AGOA (Voest 2002).

Similarly, smallholder agricultural production is particularly important for reducing poverty in Mozambique, especially since 80 percent of the population depends

on agriculture for their livelihoods, 71 percent of the rural population lives below the national poverty line, and 98 percent of the country's farms are smaller than three hectares. Even though it is still recovering from both a civil war that ended over a decade ago and disastrous floods in 2000, the country's average GDP growth rate between 2000 and 2003 averaged 8.1 percent with agricultural growth reaching 13 and 9 percent in 2001 and 2002, respectively. Encouragingly, agricultural production particularly increased among smallholder crops, such as maize, cashew nuts, and cotton. Sugarcane production also increased substantially, by about 172 percent in 2002, and even though 60 percent of sugarcane cultivation occurs on large plantations, the rehabilitation of the sugar industry has created new jobs in the rural areas among the peasant population, thereby showing the potential for stimulating backwards linkages (MoPF, 2003).

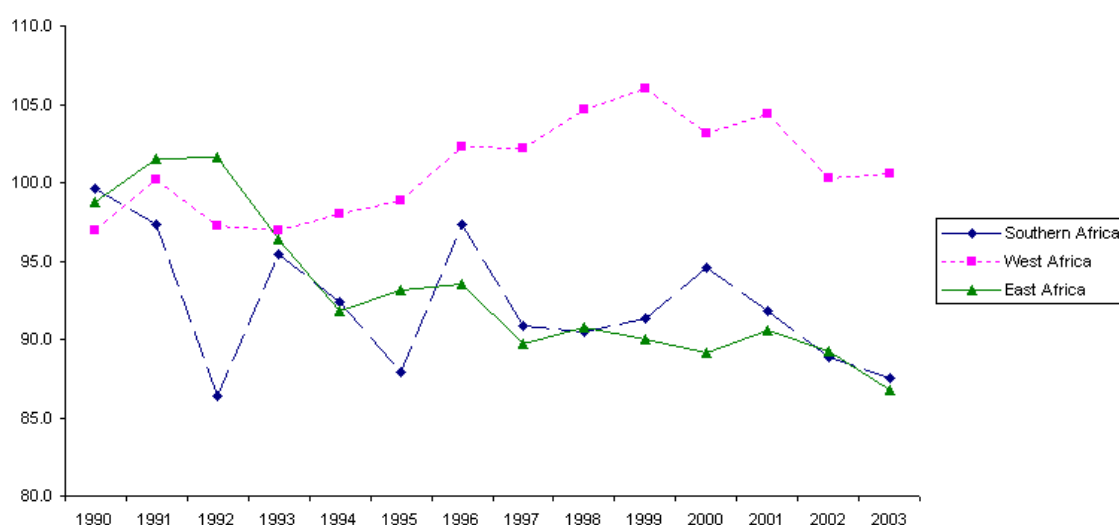
These positive developments can be partially attributed to the Government's continued commitment to macroeconomic reforms that control the level of public expenditure and maintain low inflation. It is also due to the efforts of the government's Ministry of Agriculture and Rural Development (MADER), which is disseminating improved agricultural production techniques, simplifying the procedures related to land use rights, promoting greater access to input markets and agricultural commercialization, and creating rural micro-finance institutions. Admittedly, government expenditure on agricultural and rural development as a percentage of total expenditures has increased only marginally, from 5.2 percent in 1999 to 5.5 percent in 2002. Nevertheless, the government's expenditures on complementary sectors, including education, health, and infrastructure, are quite high. Among other interventions, the Government intends to expand the number of available roads in order to integrate poor, isolated regions into national markets and help reduce transport costs (MoPF, 2003).

West Africa

Despite recent wars in Sierra Leone, Guinea, and Liberia as well as continuing instability in Côte d'Ivoire, the West African sub-region has experienced the continent's highest rates of growth over the past six years with both GDP and agricultural growth

averaging around three percent. Although per capita agricultural incomes decreased by 35 percent between 2001 and 2002, from \$315 to \$204, the sub-region still has higher per capita agricultural incomes than the other two sub-regions. Similarly, per capita food and agricultural production has not skyrocketed but West Africa has at least maintained its 1989-1990 level of production while the other two sub-regions have experienced a decrease (**Figure 2**).

Figure 2: Comparison of Per Capita Agricultural Production Across Sub-



Regions

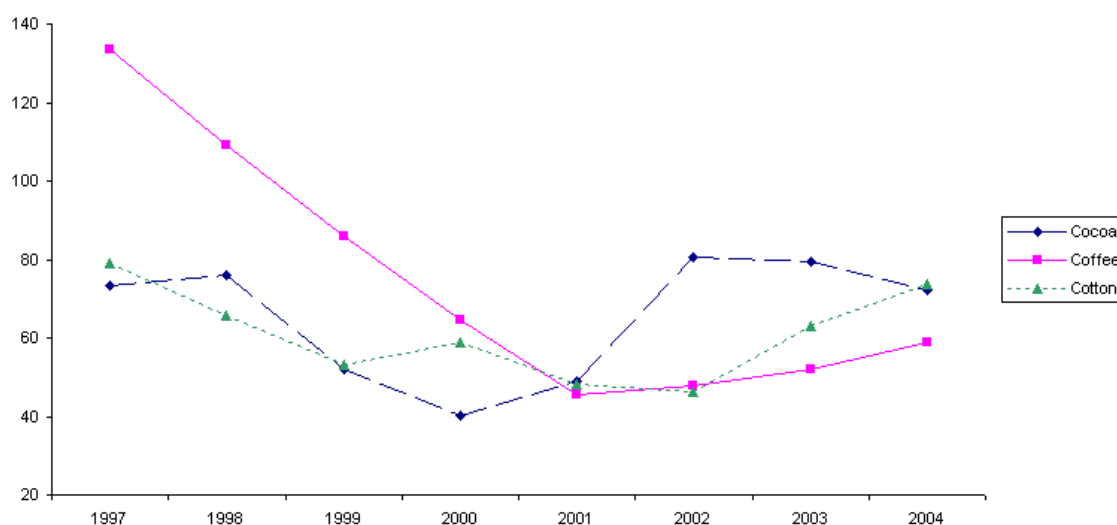
Source: FAOSTAT

Regardless of this growth, the region could benefit from increased use of agricultural inputs. Most of the countries only use one-third of their potentially arable land and irrigate about one percent or less of arable cropland. Even though fertilizer application rates are slightly higher than those found in East Africa, they are more than twice as low than those in Southern Africa. While HIV/AIDS prevalence is not as high as in Southern Africa, it still averages around 5 percent of the adult population and according to a recent FAO report, HIV/AIDS will cause Côte d'Ivoire and Burkina Faso to lose between 24 percent and 20 percent of their work forces by 2020. Other diseases,

including measles and malaria, also pose significant risks to the region's labor productivity (FAO 2002).

In the immediate future, the ability of agriculture to contribute further to the sub-region's growth requires improvements in the trade environment. Already, the sub-region is benefiting from the recovery of prices for its two main export commodities: cocoa and cotton (**Figure 3**). Nevertheless, the production of West African cotton, which is a critical export crop for smallholders, remains stymied by the \$6 billion in subsidies bestowed by the US, EU, and China on their domestic cotton producers. The Sectoral Initiative in Favor of Cotton submitted by Benin, Burkina Faso, Chad, and Mali during the Cancun Conference of the Doha Round highlighted that the four countries jointly lose about 250 million dollars in annual export revenue because of these subsidies (WTO, 2003). Indeed, the subsidies are responsible for a 10-40 percent decline in world cotton prices (Diao 2003b). Meanwhile, research in Benin shows that just a one percent fall in world prices causes the incidence of poverty among cotton producing households to increase by 1.5 percent (Badiane).

Figure 3: World Prices (US cents / lb.) for Selected Commodities



Source: FAO's Commodities and Trade Division, International Cocoa Organization (ICCO), International Coffee Organization (ICO), COTLOOK

Although further negotiations on international trade conditions are crucial, IFPRI model projections show that intra-African market improvements in the cotton sector would have an even bigger impact. By reducing marketing margins in cotton trade, the total value of African cotton exports rises by more than 60 percent, tripling the gains that occur from liberalizing world cotton markets and eliminating developed countries' cotton subsidies. Lowering trade margins raises the real prices faced by cotton producers and hence production of cotton increases by 37 percent, which is more than four times greater than the gains obtained from trade liberalization (Diao 2003b).

Already, West African countries are exploring possibilities for greater sub-regional trade spillovers. Although intra-African trade is greater than intra-West African trade, greater trade occurs within the sub-region's economic communities than in those of Southern and East Africa. Indeed, trade within the Economic Community of West African States (ECOWAS) as a percentage of its total exports equals 11.1 percent and might increase as the ECOWAS countries that do not belong to the francophone-dominated West African Economic and Monetary Union (WAEMU) pursue fast track monetary harmonization in the near future (COMESA 2003). As for the countries within WAEMU, trade is equal to 12.6 percent of total exports (UNCTAD).

Smallholders are increasingly taking advantage of the opportunities offered by these organizations. For instance, ECOWAS protocols and agreements have enabled Ghanaian smallholders to participate more actively both in cross-border trade and in the production of non-traditional goods (Sarpong, 2003). In fact, the value of non-traditional agricultural exports increased from \$26 million in 1993 to about \$75 million by 2001. By 2001, at least 75 different non-traditional agricultural products were being exported, including seafood, pineapples, yams, and shea nuts (DAI, 2003). Smallholders have also been introduced to sunflower cultivation, which requires little herbicide, pesticide, and fertilizer, and has modest water requirements. Smallholders benefit from the President's Special Initiative to diversify smallholder agricultural incomes as well as from Government provision of improved cassava and rice seeds, credit for fertilizers, and mass vaccinations of livestock (AfDB 2003).

Recent improvements in macroeconomic stability and progressive reductions in external trade tariffs have been conducive to growth in both agriculture and in the wider economy, thereby supplementing the Ghanaian Government's already impressive strides in poverty reduction. In fact, IFPRI projections show that if the country continues to achieve a two percent annual growth rate in per capita GDP, the poverty ratio could be reduced from 40 to 20 percent by 2020. Although this is not far from the MDG, the attainment of an annual per capita GDP growth rate of 3.2 percent could halve poverty and reduce child malnutrition from 25 to 13 percent by 2015. In order for staple crops to contribute to this increased growth, significant demand constraints, including low non-agricultural incomes and low growth in the livestock sector that would otherwise increase demand for feed, must be overcome. In order for non-traditional crops to continue growing, constraints in trade services and transportation need to be removed (Diao, 2003a).

Indeed, landlocked Mali's expansion into non-traditional agricultural exports occurred through overcoming transportation bottlenecks. Specifically, a non-profit, government-funded agency known as the Agricultural Trading and Processing Promotion Agency (APROFA) assisted smallholders during the 2000/2001 crop season with improving the quality of their mangoes, establishing a joint venture with an Ivorian private operator, and developing sea shipment logistics to connect Mali to the EU market through the port of Abidjan. This resulted in a meteoric rise in Mali's mango exports to the EU, enabling the industry to become a \$1.3 million business. Moreover, it demonstrates the value of planning interventions at every stage of marketing and production as well as ensuring that the supply chain addresses market requirements (Danielou *et. al.*, 2003).

Likewise, horticultural exports are becoming an important agricultural sub-sector in Senegal. Between 1998 and 2001, exports of fruits and vegetables grew by approximately 41 percent in volume, from 6592 tons to 9352 tons, and increased by 7 percent per annum in dollar terms, which exceeded total export growth during the same period. Moreover, these exports became more diversified to include cherry tomatoes,

mangoes, melons, papaya, and asparagus to complement long-standing trade in green beans. By 2007, it is projected that the volume of total exports will more than double to 22,450 tons. Among other factors, the sector's growth has been assisted by an autonomous agency known as the Agricultural Export Promotion Project (AEPP). In addition to conducting studies about horticulture's market potential, supporting producer groups active in the sector, and providing information on quality standards in foreign markets, the AEPP has ongoing plans to create refrigeration centers, rehabilitate freight facilities at the Dakar airport, provide technical assistance, and engage in pilot projects. Although considerable constraints remain, including insufficient infrastructure and market integration, growth in the sector can contribute significantly to rural poverty reduction. Smallholders are particularly dominant in export horticulture and because of the sector's labor-intensive nature, it can create a number of employment opportunities (IF 2003). In fact, the sector has thus far created 10,000 rural jobs, 35 percent of which are filled by women (IFLEX 2004).

In addition to taking advantage of burgeoning market and trade opportunities, the West African sub-region is adopting technologies that are suitable to its unique geography and climate. Most notably, the cross-breeding of high yielding Asian rice varieties with drought- and disease-resistant African varieties resulted in New Rice for Africa (NERICA) cultivars, which have been introduced to 17 West and Central African countries. NERICA not only requires less fertilizer and provides more protein than conventional varieties but also predominantly benefits women and the poorest smallholders. Research indicates that by 2006, the savings for the West African region in terms of rice imports will be approximately USD 88 million annually. The contribution of NERICA is so significant that its main developers, Dr. Monty Jones and Professor Yuan Longping won the 2004 World Food Prize (WARDA 2004).

East Africa

Conflict has plagued a majority of East Africa's countries, stymieing growth and exacerbating food insecurity. Although agricultural and GDP growth rates between 1996

and 2002 are on par with those of the other two sub-regions, East Africa has the lowest per capita agricultural incomes, per capita agricultural production, and per capita food production. At the same time, almost 80 percent of East Africa's population depends on agriculture for their livelihoods and agriculture constitutes 40 percent of the region's GDP, figures that are substantially higher than in the other two sub-regions.

Traditionally, East Africa has received more cereal food aid than the other two regions, a trend predominantly driven by Ethiopia and Eritrea and to a lesser extent, Rwanda, Kenya, and Sudan. High food insecurity has coincided with high malnutrition. In particular, per capita energy intake has actually decreased by 100 calories over the last decade, a trend especially driven by declines in Burundi, the DRC, Madagascar, and Tanzania. The sub-region not only has Africa's highest rate of child stunting, around 44 percent, but also has experienced no improvement in this area within the last decade. Moreover, East Africa is the only sub-region expected to experience an increase in the percentage of children underweight by 2005 (UNSCN 2004).

However, these generally negative trends obscure not only the vast disparities between the region's countries but also positive policy changes that have yet to make an impact on the data. For instance, Ethiopia has East Africa's lowest per capita agricultural incomes and structural food insecurity plagues about 2 to 3 million people every year. The country is not only grappling with its vulnerability to extreme weather conditions but also recovering from protracted conflict with Eritrea and declining coffee prices. Since the 1990s, the current government has engaged in a series of reforms, such as market liberalization, subsidy removal, and tariff reductions, to transform the country from a command economy (AfDB, 2003). Nevertheless, malnutrition and poverty in Ethiopia are major problems with 47 and 57 percent of children underweight and stunted, respectively, and 44 percent of the total population living below the poverty line.

Since agriculture constitutes about 40 percent of the country's GDP and represents a source of livelihood for about 85 percent of the population, growth in agriculture is crucial for reducing hunger and poverty. However, IFPRI model projections show that if the sector continues to grow at its current rate, the population living in

poverty will actually increase by 2015. If there were annual productivity improvements of 1.2 percent, 3.1 percent, and 8.8 percent in the staples, livestock, and nontraditional export sectors, respectively, a 4.3 GDP growth rate and 5.3 agricultural GDP growth rate could be achieved and both national and rural poverty would be halved by 2015. An even more substantial impact occurs if productivity increases in these three sectors are accompanied by a decrease in marketing costs and a 20 percent productivity increase in the service sector. This scenario results in a 5.3 GDP growth rate and a 6.1 agricultural GDP growth rate, which subsequently causes the national poverty ratio to fall to 17 percent and rural poverty to fall below 20 percent. Reducing these marketing costs involves improving the road network and providing more storage and marketing facilities (Diao *et. al.* 2004).

These policy prescriptions coincide with the aims of Ethiopia's Agricultural Development Led Industrialization Strategy (ADLI), which accords agriculture a leading role in stimulating growth and providing food security. Under the ADLI, smallholders are targeted through agricultural extension and credit schemes, the expansion of primary education and health care, and greater provision of rural roads and water supply. The government has also focused on improving the efficiency of the agricultural input market, addressing land tenure issues, and training programs for farmers. While expenditures on agriculture and food security as a share of total expenditures have decreased slightly, from 8 to 7.5 percent between 1999-2000 and 2002-2003, expenditures on roads increased by 4 percent during the same period and defense expenditures fell by almost 28 percent (MoFED, 2003).

In contrast to Ethiopia, Uganda is East Africa's wealthiest country, measured in terms of GDP per capita and per capita agricultural incomes. By maintaining low inflation and export openness, prudent fiscal management that enables higher investments in poverty alleviation, and initiating a set of political, administrative, and managerial reforms, the Ugandan government demonstrates its commitment to creating an enabling environment for investment and growth. Indeed, real GDP grew by 6.3 percent in 2001/02 and agricultural growth has remained at between 4 and 5 percent since 1999.

Favorable agricultural output can be partially attributed to good weather conditions as well as some of the Government's initiatives under the Plan for the Modernization of Agriculture (PMA), including the distribution of tea plantlets to households, the supply of cotton seeds to ginners, and stocking the lakes with fish. As the central element of the government's strategy to increase the incomes of the rural poor, the PMA has been a means for increasing the poor's access to productive assets, improving rural infrastructure, and linking national research to farmers. Although the agricultural sector has suffered from declines in the price of coffee, which led to a \$222 million decrease in coffee export earnings between 1998 and 2002, there has been an 81 percent increase in non-traditional exports during the same period. In fact, non-traditional exports account for 65 percent of all goods exports, and earnings have increased from \$165 million in 1998 to \$300 million in 2002. This reflects the government's progress at export diversification, which it began pursuing through a program for strategic intervention in the fish, horticulture, tea, coffee, cotton, livestock, and ICT sectors.

Nevertheless, a number of trends indicate that the country still has a long way to go. First, the share of government expenditures on agriculture during the last three years only average at 2 percent while expenditures on public administration and security are 17.5 and 13 percent, respectively. Secondly, the security situation in the Northern area of the country, where the government is fighting the Lord's Resistance Army rebels, continues to exacerbate regional wealth inequalities. Thirdly, despite reductions in dollar a day poverty, rural poverty is a high 85 percent. Although the percent of children under five years of age who are underweight has decreased from 27 to 23 percent between 1995 and 2001, the percent of child stunting increased from 36 to 39 percent during the same period and 28 and 64 percent of children suffer from vitamin A deficiency and anemia, respectively (AfDB, 2003; MoFPED, 2003).

Along with Kenya and Tanzania, Uganda revived the East African Community (EAC) in 1999, which could facilitate greater regional trade and infrastructure investments. All three countries have already removed a large percentage of tariff and non-tariff barriers on cross-border trade and are continuing to implement a regional road

network and railway system (COMESA 2003). By establishing an East African Customs Union (EACU) in March 2004, the members aim for a common external tariff and to reduce internal tariffs to zero by 2008. In addition, the EAC intends to increase regional economic output through interventions in the areas of agriculture and energy (MoFPED, 2003). Currently, however, the relationship among member countries is not equal. While Kenya possesses a favorable intra-EAC trade balance, Tanzania and Uganda both have considerable deficits. Since most of their trade is with the European Union, Kenya is the destination for only 4.6 percent of Uganda's exports and less than 3 percent of Tanzania's (Mutasa, 2003).

All of the countries within East Africa, along with 6 in Southern Africa, belong to the Common Market for East and Southern Africa (COMESA). In October 2000, COMESA established a Free Trade Area (FTA) that eliminates tariff and non-tariff barriers on goods from other COMESA members. During the first three years of operation, intra-FTA trade grew on average by 25 percent per annum, and intra-COMESA trade equaled \$4.5 billion by 2002. In the near future, COMESA member countries also anticipate adopting a common external tariff, standardizing tax and investment laws, promoting the adoption of a single currency and eventually establishing a monetary union (Mwencha, 2004).

Many countries are also expanding into non-traditional agricultural exports, which are valued at about \$1.4 billion for the sub-region (Diao *et. al.* 2003). This is particularly the case in Kenya where the value of fruit and vegetable exports has grown by over \$147 million since independence and increased from 3 percent of agricultural exports to 17 percent during the same period. Kenyan smallholders produce about 60 percent of horticultural exports and benefit by about \$46 million from the industry. Besides providing direct income to producers, the industry increases domestic food security and creates multiplier effects as horticultural producers purchase the goods and services of other rural households. Limited direct government intervention in the horticultural market combined with realistic exchange rates and the maintenance of relative macroeconomic stability have not only stimulated exports but also attracted private

domestic and international investment. The sector also benefits both from investments in agricultural research as well as from an extensive road network in the highland areas that enables fast transfer to the airport (Minot and Ngigi, 2003). Moreover, supermarkets that have entered Kenya purchase three times the volume of fruits and vegetables than Kenya sells on the international export market (Weatherspoon and Reardon, 2003).

In addition to horticultural exports, research indicates that East Africa, which contains over 40 percent of Africa's cattle resources, is the promising sub-region for increasing dairy production. For example, in Kenya, the sector has grown at 2.8 percent annually over the last twenty years with smallholders producing almost 80 percent of the country's milk. These smallholders have identified milk production as their fastest growing income source. Some of the reasons for this sector's growth include increased output prices due to market liberalization and the introduction of highly productive breeds of dairy cows (Ngigi 2003).

Increased investments in agricultural productivity in the sub-region are also on the horizon. For instance, CIDA has pledged to allocate \$22.5 million to establish a Biosciences Facility for Central and Eastern Africa (Dickson, 2003). Based at the International Livestock Research Institute's (ILRI) Nairobi facilities, researchers at the Center will focus on developing nutrient-rich plants that are resistant to disease and stress and create vaccines against livestock diseases. In addition, the Kenyan Agricultural Research Institute (KARI) recently announced the launch of a \$12.5 million, five-year agricultural biotechnology program that will develop, among other things, livestock vaccines and virus-resistant sweet potato (Chege and Mboyah, 2003).

III. CONCLUSION

Examining trends, projections, and case studies across sub-regions and countries validates the need for both prudence and optimism about the ability of Africa's smallholders to contribute to and benefit from reductions in hunger and poverty.

At the aggregate level, Africa is far from achieving the MDGs and less than one-third of the countries in the region are even close to the 7 percent GDP growth rate deemed necessary to halve poverty by 2015. Likewise, the goals of NEPAD's CAADP to increase agricultural growth by 6 percent and public expenditures on the agricultural sector by 10 percent have thus far eluded most African countries.

On the other hand, however, recent research and past experience provides a great deal of guidance on which interventions can assist with reaching these targets. Tellingly, high transaction costs caused by inadequate physical infrastructure and poor market development are repeatedly identified as hindrances to reducing poverty within countries and to generating growth within particular agricultural sectors. Indeed, many African countries are diversifying into non-traditional agricultural exports but the nature of the sector requires access to storage and refrigeration facilities as well as close proximity to roads and airports. Addressing transaction costs will also be instrumental in creating linkages between smallholders and expanding industries, such as supermarkets and the textile sector. In addition, investments in biotechnology can assist with reducing required inputs, increasing the nutritional content of food crops, and mitigating against the effects of droughts, diseases and pests.

Achievements thus far within each sub-region's RECs provide a glimpse of the possibilities for creating synergies across countries and benefiting from economies of scale. Specifically, they offer a forum for negotiating tariff reductions, thereby promoting greater intra-sub-regional trade, as well as for collaborating on infrastructure investments. As evidenced in SADC, these RECs can also assist with formulating common policies for dealing with biotechnology issues.

Most significantly, genuine and sustained political commitment to agriculture is paramount, particularly since lack of political will is often identified as the major constraint in achieving food and nutrition security in Africa (FAO 2004; IFPRI 2004). In fact, a recent survey of experts on African agricultural successes revealed that government policymakers, agricultural ministries, and extension services are most frequently seen as the initiators of positive change. This reflects that many of the necessary ingredients for agricultural growth, such as research and infrastructure, are public goods that require government involvement and support (Gabre-Madhin and Haggblade, 2003). Moreover, governments play a key role in both providing an enabling macroeconomic policy environment and actively assisting smallholders. Indeed, in those countries where governments have developed and implemented an agricultural strategy, smallholders are beginning to gain access to crucial input and output markets.

Fortunately, the efforts of NEPAD and the achievements of governments highlighted throughout this paper demonstrate that the commitment among African leaders is forthcoming and that agriculture is at the top of most African countries' agendas. International donors must echo this commitment by achieving greater coherence between their trade and aid policies as well as by clarifying how their agricultural initiatives fit with those of African governments, NEPAD, and other donors. This would not only elucidate where there are opportunities for coordination and scaling up but also help ensure that multiple initiatives do not undermine each other. In this manner, case studies of smallholder successes could become less exceptional and more instrumental in generating a positive reversal in aggregate trends.

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LIST OF DISCUSSION PAPERS

- No. 01 “Market Opportunities for African Agriculture: An Examination of Demand-Side Constraints on Agricultural Growth” by Xinshen Diao, Paul Dorosh, and Shaikh Mahfuzur Rahman with Siet Meijer, Mark Rosegrant, Yukitsugu Yanoma, and Weibo Li.
- No. 02 “Exploring Regional Dynamics in Sub-Saharan African Agriculture” by Xinshen Diao and Yukitsugu Yanoma.
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