



Economic Commission for Africa
Southern Africa Office

Agricultural Input Business Development in Africa: Opportunities, Issues and Challenges





Economic Commission for Africa (ECA)
Southern Africa Office (SRO-SA)

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Acronyms and abbreviations

AAC	African Agricultural Capital
AU	African Union
3ADI	Agribusiness and Agro-industries Development Initiative
AfDB	African Development Bank
AECF	Africa Enterprise Challenge Fund
AICC	African Institute of Corporate Citizenship
AGRA	Alliance for Green Revolution in Africa
ASIF	Africa Seed Investment Fund
CAADP	Comprehensive Africa Agricultural Development Programme
CIF	Cargo, Insurance and Freight
COMESA	Common Market for Eastern and Southern Africa
DG	Director-General
FAO	Food and Agriculture Organization of the United Nations
FSSDD	Food Security and Sustainable Development Division
GDP	Gross Domestic Production
GGP	Government of Tanzania Grain Partnership
HLCD-3A	High-Level Conference on Development of Agribusiness and Agro-Industries in Africa
ICTs	Information and Communication Technologies
ICRISAT	International Crops Research Institute for Semi arid Tropics
IFAD	International Fund for Agricultural Development
IFDC	International Fertilizer Development Corporation
IFPRI	International Food Policy Research Institute
IWMI	International Water Management Institute
MAP	Malawi Agricultural Partnership
MDGs	Millennium Development Goals
MSMEs	Medium and Small-Scale Enterprises

NAFDAC	National Agency for Food, Drug Administration and Control
NEPAD	New Partnership for African Development
OPV	Open-Pollinated Varieties
PPPs	Public Private Partnerships
ReSAKSS	Regional Strategic Analysis and Knowledge Support Systems
SAPs	Structural Adjustment Programmes
SMEs	Small and Medium Enterprises
SSA	Sub-Saharan Africa
SCODP	Sustainable Community-Oriented Development Programme
TAP	Tanzania Agricultural Partnership
UN	United Nations
UNECA	United Nations Economic Commission for Africa
UNECA-SA	United Nations Economic Commission for Africa-Southern Africa
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
WASA	West Africa Seed Alliance

Foreword

Despite Africa's rich agricultural resource endowment, the African continent remains the only region of the developing world where agricultural input business is not well-developed. Despite the importance of agriculture in their economies, many countries on the continent are yet to establish a systematic focus in their agricultural planning history that shows a conscious effort to purposely prioritize the development of agricultural input business.

Economic growth and poverty reduction in Africa can be achieved by enhancing the productivity and profitability of agriculture through the development of the agricultural input sector. This study reviews the current state of agricultural input production, marketing and consumption in Africa, with the goal to identify primary business opportunities and constraints, risks and challenges from the private sector perspective. The study also summarizes the major existing partnerships and initiatives in the agricultural input business sector in Africa, especially Public-Private Partnerships (PPPs) and other joint ventures in order to address the factors that impede agricultural input use in Africa and document best practices, lessons and challenges in fostering agricultural input business development in the region. Furthermore, the study sheds more light on prospective and potential successful business alliances and partnerships in the agricultural input sector in order to tap the under-exploited market opportunities in Africa.

ECA-SA is grateful to Dr. Babatunde Omilola, the consultant who prepared the study. Mr. Jean Luc Mastaki Namegabe supervised the consultant under the general guidance of Mr. M.E. Dhliwayo, ECA-SA Senior Economic Affairs Officer and Head of the Infrastructure and Sustainable Development Cluster. The ECA-SA professional team of Alfred Latigo, Wilfred Lombe, Johnson Oguntola, Mzwanele Mfunwa, Jack Jones Zulu, Matfobhi Riba, Atamelang Ngwako, Keiso Matashane and myself provided valuable inputs through review of drafts of the study. The contribution of ECA-SA support staff is acknowledged.

The final draft of the study benefited from experts who took part in the Working Lunch on "*Public Private Partnerships in Agribusiness and Agro-industry Development in Africa through Regional Value Commodities Chains*" organized in Abuja, Nigeria in March 2010, through a collaborative effort between the United Nations Economic Commission for Africa (ECA), the United Nations Industrial and Development Organization (UNIDO) and the Food and Agriculture Organization (FAO), within the framework of the HLCD-3ADI. ECA therefore gratefully acknowledges the collaboration with UNIDO, FAO and the FSSDD and extends its sincere appreciation to all the participants of the High-level Conference on Development of Agribusiness and Agro-industries in Africa (HLCD-3ADI) for their valuable comments on the first draft of the study.

ECA-SA gratefully acknowledge the inputs made by Mr. Kanayo Nwanze, President of the International Fund for Agricultural Development (IFAD), Mr. Kandeh K. Yumkella, Director-General

UNIDO and Mr. Josué Dione, Director, ECA Food Security and Sustainable Development, FSSDD Ms. Josephine Okot, the Managing Director of the Victoria Seeds Ltd. Uganda, Mr. Geoffrey C. Mrema, the FAO Director for Rural Infrastructure and Agro-Industries Division and Mr. Patrick Kormawa, the advisor to the Director-General and Coordinator of the UNIDO International Financial Institutions Partnership Unit which strongly contributed to the success of the ECA-FAO-UNIDO Working lunch in Abuja.

ECA-SA also gratefully appreciates the competent services of the Publications and Conference Management Section (PCMS) of ECA, led by Doreen Bongoy-Mawalla, Director of the Division of Administration, and coordinated by Marcel Ngoma Mouaya for the editing, translation, printing and publication of this study.

It is my sincere hope that the recommendations of this study will be useful to all stakeholders and to our member States and development partners.

Jennifer Kargbo
Director
United Nations Economic Commission for Africa
Southern Africa Office

Acknowledgements

The United Nations Economic Commission for Africa, Southern Africa Office gratefully recognizes the input of Dr. Babatunde Omilola in preparing this study. Mr. Jean Luc Mastaki Namegabe supervised the completion of the study. The contribution of Maurice Tankou and colleagues in Food Security and Sustainable Development Division of ECA to the preparation, review and finalization of this study is gratefully recognized. Comments made by a team of experts who took part in the ECA-UNIDO-FAO Working Lunch on “*Public Private Partnerships in Agribusiness and Agro-industry Development in Africa through Regional Value Commodities Chains*” held in Abuja, Nigeria in March 2010 have provided a great opportunity to review and enrich the first draft of the study. The guidance of Mr. M.E. Dhliwayo, ECA-SA Senior Economic Affairs Officer and Head of the Infrastructure and Sustainable Development Cluster and the support of the Director of ECA-SA, Ms. Jennifer Kargbo, in the overall supervision of the completion of this study are acknowledged.

Executive Summary

The objective of this study is to review experiences, identify opportunities and make practical recommendations for agricultural input business development in Africa. The underlying premise is that economic growth and poverty reduction in Africa can be achieved by enhancing the productivity and profitability of agriculture through the development of the agricultural input sector in Africa. The study is articulated around the following inter-related components:

- a. The current state of agricultural input production, marketing and consumption in Africa, using quantitative and qualitative data with the goals of identifying primary investment, business/trade opportunities and constraints, risks and challenges from the private sector perspective;
- b. The existing partnerships and initiatives in the agricultural input business sector in Africa, especially the Public-Private Partnerships (PPPs), cooperatives and joint ventures in order to address the factors that impede agricultural input use in Africa and document best practices, lessons and challenges in fostering the agricultural input business development in the region;
- c. The prospective and potential successful business alliances and partnerships in the agricultural input sector in order to tap the under-exploited market opportunities at national, regional and international levels while strengthening commodity value chains; and
- d. A strategic framework for sustainable agricultural input business development in Africa to identify key policy and support actions aimed at strengthening the agricultural input investment climate towards a market-led development in the sector.

The study is focused on three types of agricultural inputs in Africa, namely fertilizer, seed and irrigation. The study is carried out on each of the above components broadly through a combination of critical review and analysis of the literature, case studies and scientific scrutiny of real-life experiences of the major stakeholders in the sector, especially the business community and other relevant institutions. The study also assesses the efficiency of the different partnerships, alliances and policies aimed at promoting the market-led agricultural input development in Africa. In this regard, the findings of the study enhance the knowledge base and improve the understanding of experiences and lessons learned from past agricultural input business development in Africa, elucidate past trends and future development strategies, analyze constraints, and identify opportunities for overcoming them.

The findings of the report show in more detail that the constraints preventing a successful agricultural input market in Africa are on both the demand and supply sides and unique to the African context. For one, the general isolation of rural farmers from markets makes marketing costs prohibitively high for most suppliers. In addition, perceived demand for inputs is low, despite the contrary. Direct interventions of governments in providing inputs can be more disruptive than supportive, and in almost all cases the resources used can be better spent elsewhere. Ensuring that complementary public goods – transportation infrastructure, communication, research and extension, irrigation – are provided can foster a more successful commercial market for inputs. The private sector is more capable of providing inputs to farmers at lower prices and in reliable quantities, but only if the supply side constraints are also overcome.

The return to smart subsidies is worrisome. Although there are situations in which subsidies may be the most effective strategy (for example, in the immediate aftermath of an emergency), they are often difficult to phase out and present opportunities for capture and rent-seeking. In addition, they discourage private investment in the sector. However, guidelines for avoiding the disadvantages of input subsidies are available for governments that wish to pursue a subsidy policy.

Revolutionizing the input supply system in Africa requires a holistic approach that addresses, among other issues, access, affordability, availability, and incentives. It is not surprising that the use of vouchers as an alternative distribution strategy for agricultural inputs is now rampant in many African countries; however, under-delivery and the disruption of agricultural input marketing pose enormous challenges. Strengthening agricultural input supply system through public-private partnerships, and strengthening capacity for appropriate distribution of inputs are top priorities.

I. Introduction

1.1 Recent developments in Africa's agriculture

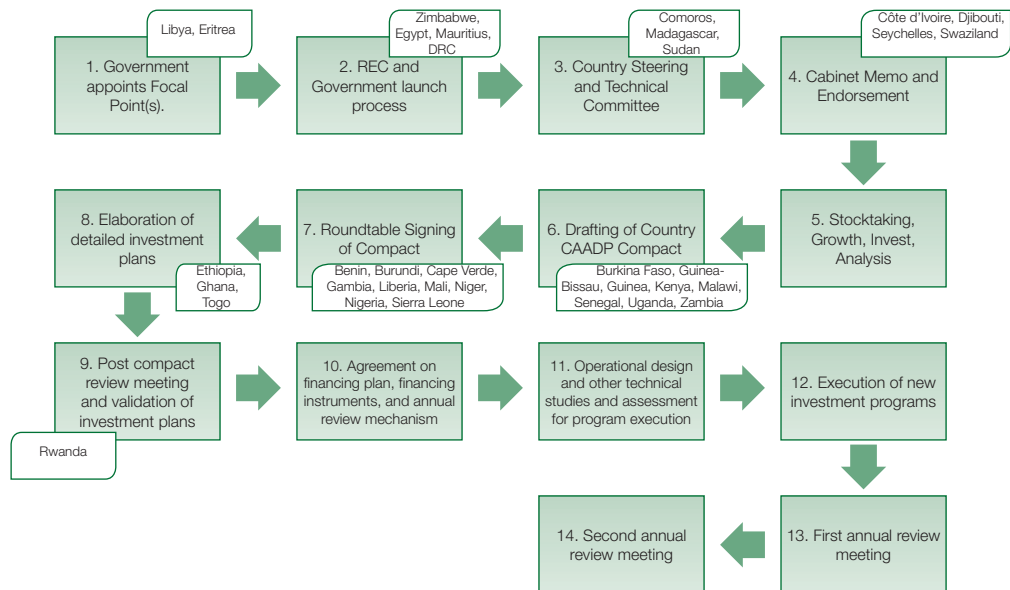
1. Historically, agriculture has been the backbone of many economies in Africa. The agricultural sector in Africa has performed commendably and is the continent's major source of employment, income generation and foreign exchange. The pivotal importance of agriculture as the primary source of livelihood of the vast majority of Africans underlines the centrality of the contribution of agriculture to food self-sufficiency. Agriculture is crucial to development in Africa, as the majority of the population lives in rural areas, and at least 70 per cent of the workforce is engaged in agriculture. In many African countries, growth in agriculture is the most effective strategy for reducing poverty and promoting overall economic growth.

2. Agriculture is now firmly back on the development policy agenda of many African countries after several decades of neglect. It is not surprising, therefore, that there have been major improvements in African agriculture during the last decade. The plausible reason for the renewed interest in African agriculture is the centrality of agriculture to food security and poverty reduction in Africa. Agriculture remains the most important economic sector in many African countries in terms of its contribution to the overall GDP, thereby contributing to the overall output growth of the continent. If agriculture were to be skipped in the economic diversification strategy of many African countries in favour of other sectors such as manufacturing and services, the short-term and long-term implications would be the exacerbation of poverty in the rural areas of Africa where agriculture remains the major influence of providing farm incomes as well as opportunities for non-farm incomes. Significant populations of the urban poor in Africa also earn their livelihoods from trading and processing of agricultural produce.

3. Since agriculture will long remain the main source of livelihood of roughly 70 per cent of the rural population in Africa, it is pertinent that a renewed interest in agriculture should be the main vehicle of boosting food security and reducing poverty in the continent. In 2003, African leaders and their development partners adopted the Comprehensive African Agricultural Development Programme (CAADP) in order to promote agriculture-led development that eliminates hunger and reduces poverty and food insecurity. At the national level, dozens of African countries have pledged to implement CAADP. Box 1 presents a summary of the objectives and scope of CAADP.

4. As different African countries strengthen the focus and implementation of CAADP, the strategies for connecting agriculture to poverty reduction are now being clearly articulated and operationalized. The renewed interest in agriculture is vividly evident in a number of African countries that are allocating an unprecedented 10 per cent of their budgetary resources exclusively to the agriculture sector in line with the CAADP vision for agriculture as a major driver of growth, food security and poverty reduction in Africa.

Figure 1: The Country CAADP Process and Country Status, 2009



Source: Omilola and Lambert, 2009; <http://www.nepad.caadp.net>, 2009.

1.2 Focus of Africa's agricultural input business development priorities

5. Despite Africa's rich agricultural resource endowment, the continent remains the only region of the developing world where agricultural input business is not well-developed. Consequently, there have been segmented markets of sub-optimal size of agricultural inputs, which do not ensure profitability of sizeable private investment in the different stages of the commodity chain. Despite the importance of agriculture in their economies, many countries on the continent are yet to establish a systematic focus in their agricultural planning history that shows a conscious effort to purposely prioritize the development of agricultural input business. Ordinarily, many African countries should have adopted a prioritization scheme in which, for some specified time periods, they would consciously emphasize on one or more of the areas of agricultural input production, marketing, consumption and institutional support services for agro-industry.

6. Consequently, the focus of Africa's agricultural input business development priorities should be based on: (a) a comprehensive stocktaking of existing information and knowledge that can be used to advance agricultural input business development in Africa; (b) a common understanding of priority actions needed to overcome the main constraints that are impeding the successful development of agricultural input business; and (c) a shared vision for harmonizing and aligning efforts between the public and private sectors, for the purpose of achieving greater agricultural input business development effectiveness. The key issues for such prioritization should include

awareness of improved use of improved inputs (fertilizer, seeds, irrigation) by private investors, improved management knowledge, reliability of input supplies, returns on investment, favourable business climate, availability of business credit and market access opportunities. These key issues are highlighted in various sections of this report.

1.3 Scope and objectives of the study

7. The objective of this study is to review experiences, identify opportunities and make practical recommendations for agricultural input business development in Africa. The underlying premise is that economic growth and poverty reduction in Africa can be achieved by enhancing the productivity and profitability of agriculture through the development of the agricultural input sector.

8. The study is articulated around the following inter-related components:

- a. The current state of agricultural input production, marketing and consumption in Africa, using quantitative and qualitative data with the goals of identifying primary investment, business/trade opportunities and constraints, risks and challenges from the private sector perspective;
- b. The existing partnerships and initiatives in the agricultural input business sector in Africa, especially the Public-Private Partnerships (PPPs), cooperatives and joint ventures in order to address the factors that impede agricultural input use in Africa and document best practices, lessons and challenges in fostering the agricultural input business development in the region;
- c. The prospective and potential successful business alliances and partnerships in the agricultural input sector in order to tap the under-exploited market opportunities at national, regional and international levels while strengthening commodity value chains; and
- d. A strategic framework for sustainable agricultural input business development in Africa to identify key policy and support actions aimed at strengthening the agricultural inputs investment climate to gear it to market-led development in the sector.

9. The study is focused on three types of agricultural inputs in Africa, namely fertilizer, seed and irrigation. The study is carried out on each of the above components broadly through a combination of critical review and analysis of the literature, case studies and scientific scrutiny of real-life experiences of the major stakeholders in the sector, especially the business community and other relevant institutions. The study also assesses the efficiency of the different partnerships, alliances and policies aimed at promoting the market-led agricultural input development in Africa. In this regard, the findings of the study enhance the knowledge base and improve understanding

of experiences and lessons learned from past agricultural input business development in Africa, elucidate past trends and future development strategies, analyze constraints, and identify opportunities for overcoming them.

1.4 Plan of the Report

10. Chapter one introduces the study with recent developments in Africa's agriculture. Chapter two discusses the conceptual framework of the study focusing on opportunities in the agricultural input sector in Africa and the major trends in agricultural input production, marketing and consumption in the region. Chapter three reviews existing agricultural input business development policies, partnerships and initiatives in Africa, with a clear focus on on-going Public-Private-Partnerships (PPPs) and provides a summary of the lessons learnt from them. Chapter four assesses some prospective and potential successful business alliances and partnerships in the agricultural input sector, based on the lessons learnt from the existing ones. Chapter five concludes with policy recommendations and strategies for the business community, policy makers and other stakeholders, with a view to strengthening agricultural input business development in Africa.

II. Conceptual Framework and Major Trends in Agricultural Input Production, Marketing and Consumption in Africa

2.1 Conceptual framework: Opportunities in the agricultural input sector in Africa

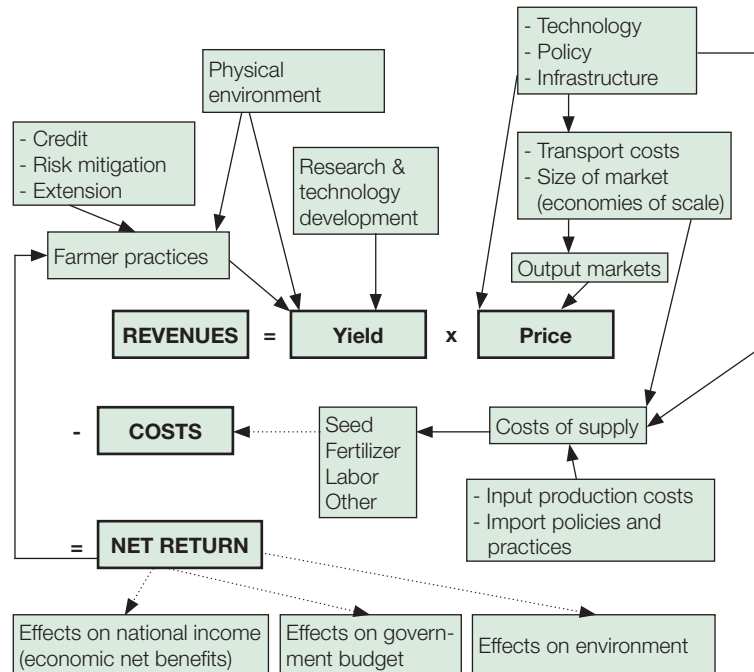
11. Fundamentally, a conceptual framework provides a guide to the organization of ideas and issues in a study. This implies that a conceptual framework must derive its validity from the objectives of a study while it, in turn, guides the study towards the achievement of its stated objectives. In its broad perspective, the overarching objective of this study is to ensure sustainable agricultural input business development in Africa. A conceptual framework for input use and market development has been popularized by the work of the International Fertilizer Development Corporation (IFDC) (2001) and Crawford *et al.*, (2003) (see Figure 2). It offers a theoretical framework for understanding the issues associated with agricultural input use and analyzing relationships between relevant factors, institutions and processes that can explain the different input business strategies, and for assessing and prioritizing input business strategies. The framework also helps us to understand the multiple channels of input business strategies to accelerate agricultural productivity, reduce poverty, increase net earnings of producers and suppliers, raise the level of nutrition, and ensure national food self-sufficiency and political stability.

12. In order to draw insights for sustainable agricultural input business development in Africa, four separate categories of business opportunities and strategies can be described: financial, economic, social and political (Crawford *et al.*, 2003). Financial consideration deals with increases in the net income of farmers, marketers, processors and others in the agricultural input supply chain. Economic strategy is about increases in real income for the overall society, based on costs and benefits in terms of opportunity cost. Social objectives include improvements in indicators of welfare that are not amenable to quantification and equity, which deals with the distribution of social benefits and costs. Central to the social dimension is the analysis of the range of formal and informal organizational and institutional factors that influence input business outcomes. The fourth dimension of political consideration provides explanation on how agricultural input business is potentially affected by any government intervention in the level or distribution of input benefits through subsidies and other interventions in order to maintain political balance and build political support.

13. By and large, the framework emphasizes the multiple interactions that affect agricultural input business development, and helps us think holistically about things that the private sector might rely on, the capital assets and investment that help them thrive and survive, the policies and institutions that impact on their business, their responses and business strategies in the

face of marketed-oriented agriculture. The framework also helps us to understand the processes that underlie agricultural input business development, and the social, cultural, political and institutional contexts in which the private sector operates. A conceptual framework on the key dimensions of agricultural input business development and on how they interact is depicted in Figure 2.

Figure 2: Conceptual framework for sustainable agricultural input business development



Source: Crawford et al., 2003

14. Broader and more accurate understanding of agricultural input business development usually depends on the objectives that are being pursued. From the private sector perspective, agricultural input business development can be viewed as sacrificing certain present values of consumption for future consumption. It is the commitment of money in order to earn future benefits. Hence, financial returns to input use at the farm level by primary producers (farmers) and profitability of input supply by input suppliers (traders) are the foundation for sustainable input business development. As illustrated in figure 2, a schematic representation of the patterns of interactions among major variables affecting net returns to input use and supply (yield, output prices and input costs) is complex. The net impact of these complex processes is profitability of agricultural input use and supply, meaning that there is sustained income growth, declining

poverty, increasing food security and enhanced environmental sustainability. The process is dynamic and involves various lags between stimuli and responses in the economic system.

15. In a situation where financial analysis illustrates unprofitability of input use and supply, a careful examination of the various factors influencing yields, prices and costs is required to increase profitability of input use and supply. Such analysis should be based on inter-sectoral linkages within the economy as agricultural inputs needed for business are obtained from the different sectors of the economy or from abroad. Unprofitability of agricultural input may also occur as a result of high input prices or low output prices. Among others, high transport costs, transaction costs, policy incentives or disincentives through interventions such as subsidies, non-competitive behaviour of marketing agents and suppliers tend to adversely affect private input markets and increase marketing costs and the uncertainty of input marketing. Agricultural input supply also tend to be limited by marketers' perceptions of low farmer demand, which implies high costs and risks in building a supply network. It is not surprising; therefore, that many analysts have emphasized supply constraints (see Lele *et al.*, 1989; Larson and Frisvold, 1996).

2.2 Defining stages of the agricultural input supply system in Africa

16. According to IFDC (2001), there are four different stages of the agricultural input supply system. These stages are defined by changes in the types of inputs used, the manner in which they are acquired, and the relative roles of the public and private sectors in supplying both inputs and credit (see Box 2). Agricultural input markets in Africa tend to be at different stages of development, depending on the region and country (e.g. agricultural production - staples versus cash crops; the number of net food consumers; dietary diversity; dependence on cereals; the extent to which the cost of higher food imports was offset by rising commodity exports and ample foreign reserves; the ability to mitigate the transmission of international prices into domestic markets through exchange rate adjustments or tariff reductions; and the extent to which local events interact with global food inflation). A thorough understanding of the different stages of the agricultural input supply system provides guidance on how to time and sequence agricultural input business development interventions.

Box 2. Stages of the agricultural input supply system development

Stage I: Subsistence

Improved varieties, chemical fertilizer and pesticides are generally not available. Farmers retain their own seed or exchange seed of poor quality and low yield. They rely on manure, crop residues and burning to maintain soil fertility.

Stage II: Emergence

Improved varieties, chemical fertilizer and pesticides emerge, especially for export crops. Both public and private sectors start input distribution, but farmer-retained seeds represent the bulk of seed used, especially for food crops. Formalized, costly and inefficient government-controlled credit systems are often introduced.

Stage III: Growth

Food crops are increasingly commercialized. Modern seed, chemical fertilizer and pesticide use spread with both the private and public sectors involved in procurement/production and distribution. Resources are increasingly available, but informal financial arrangements remain dominant.

Stage IV: Maturity

The food and cash crop markets are globally integrated. Vibrant seed, fertilizer and pesticide industries develop as the private sector takes the leading role with ancillary support from the public sector in specified tasks. Farmers use higher levels of fertilizers and pesticides, and are very knowledgeable about fertilizer attributes and requirements, timing and methods of application. Requirements are refined and dealers provide informal extension services. The financial sector deepens and broadens its asset base and lending capacity. Financial links with foreign countries are strengthened, and the importance of informal financial arrangements decreases.

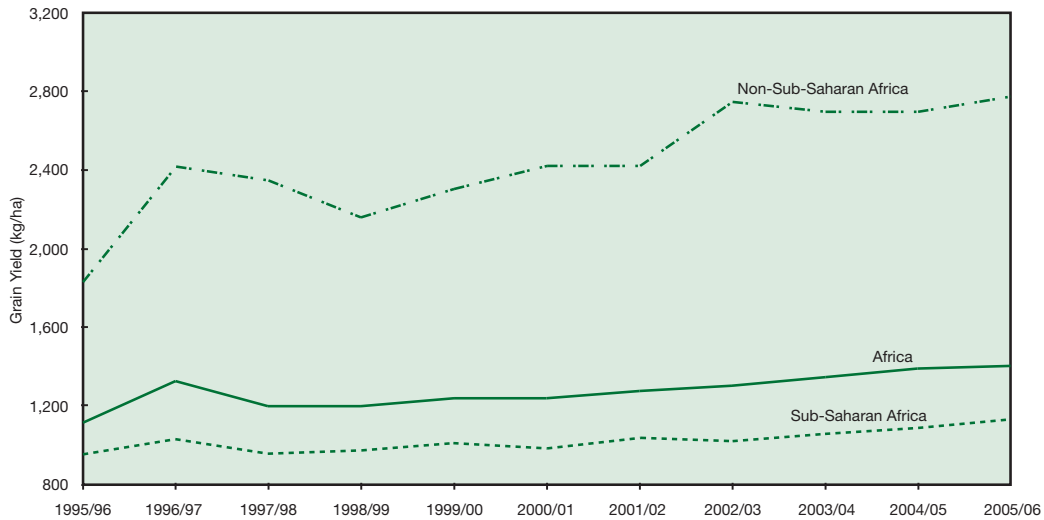
Source: IFDC (2001).

2.3 Major trends in agricultural input production, marketing and consumption in Africa

2.3.1 Agricultural production and productivity

17. Increasing agricultural production in Africa is largely dependent on increasing agricultural productivity. Therefore, there is a critical need to accelerate agricultural productivity if Africa's agriculture is to continue to grow in the way it has been doing in recent years. Higher agricultural productivity on the continent is imperative for improved food security and hunger reduction. Although cereal yields and production in sub-Saharan Africa improved slightly from 1995/96 to 2005/06, they were well below those of non-sub-Saharan Africa over the same period (figures 3 and 4).

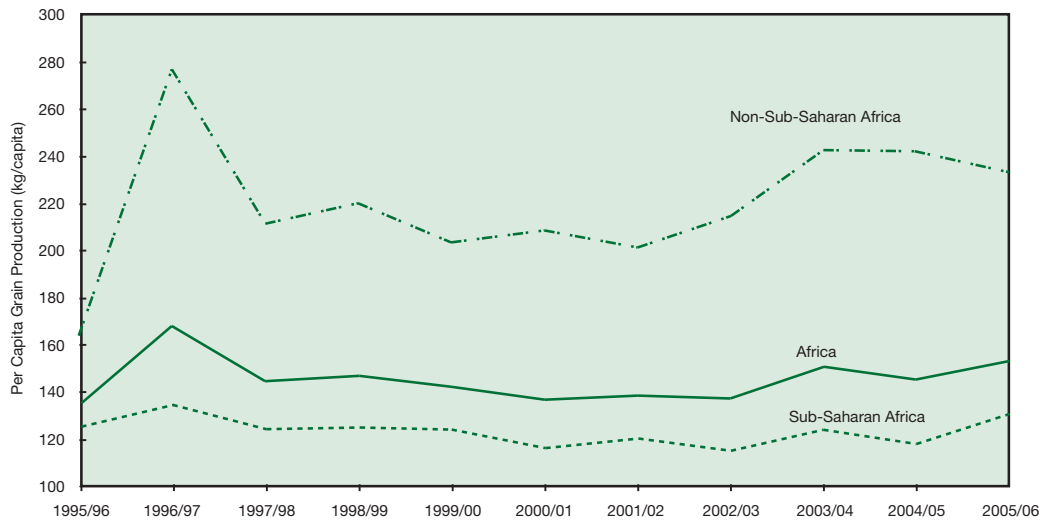
Figure 3: Africa: Cereal yields per hectare, 1995/96-2005/06



Source: IFDC based on FAOSTAT

18. A recent study at International Food Policy Research Institute (IFPRI) estimates that doubling the productivity of food staples in Africa by 2015 has the potential to raise average GDP growth to 5.5 per cent per annum, lift over 70 million people out of poverty, and turn Africa from a food-deficit region to a surplus region with 20–40 per cent lower food prices.¹

Figure 4: Africa: Cereal production per hectare, 1995/96-2005/06.

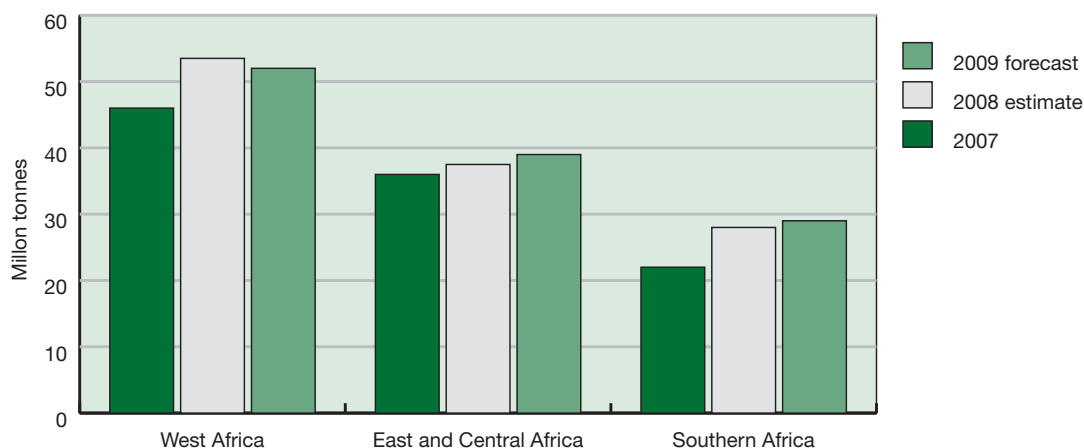


Source: IFDC based on FAOSTAT

¹ (Diao et al. 2008).

19. Several analysts have written extensively on the adverse effects of the recent dramatic increases in food prices from 2007 to 2008, leading to the well-publicized global food crisis. However, a potential opportunity arising from the food price crisis was rise in global cereal output by 7 per cent from 2007 to 2008.² According to the State of Agricultural Commodity Markets published by FAO in 2009, the increase in cereal output took place mostly in the developed countries and among Southern engines of growth such as Brazil, China and India. Nevertheless, FAO projections indicate that cereal production in sub-Saharan Africa increased by 14 per cent from 2007 to 2008. In sub-Saharan Africa, cereal production increased most in Southern and West Africa, with minimal supply response occurring in Eastern and Central Africa (Figure 5). More importantly, there was a lag of high food price transmission from the international markets to the domestic markets in many African countries.

Figure 5: Africa: Cereal production per hectare, 1995/96-2005/06.



Source: FAO Crop Prospects and Food Situation 2009.

2.3.2 Status of agricultural input production, marketing and consumption in Africa

20. It is now generally believed that investment in agricultural inputs must be prioritized in Africa in order to achieve the core MDG of halving the proportion of people living in extreme poverty and hunger by 2015. While there is little consensus on the best methods for doing so, most people consider the wide-spread use of high quality inputs as a key prerequisite (Rosegrant, Paisner and Meijer 2001). This is usually supported by evidence from Asia's Green Revolution, which relied heavily on high-yielding seed and fertilizer technologies. In Africa, intensive agriculture depends heavily on the judicious use of agricultural inputs³. This is because agricultural inputs

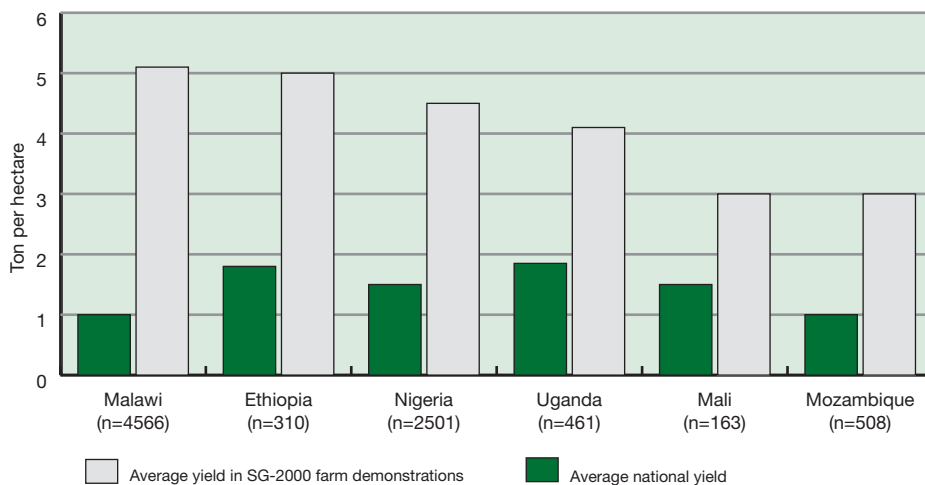
² FAO Crop and Food Prospect July 2009.

³ There are a variety of agricultural inputs that can increase productivity. However, this report will primarily focus on fertilizer, with some attention to complementary inputs of irrigation and improved seeds. The justification for this is because fertilizer is the most purchased input in Africa. In addition, most efforts and reforms to increase input use have been targeted toward fertilizers, as opposed to other direct inputs such as improved seeds. Finally, fertilizer is highlighted more so than irrigation

have contributed significantly to world food production. Massive investments in agricultural inputs in some Asian economies in the 1960s and 1970s have been successful in feeding the growing populations, achieving rapid economic growth and boosting employment generation (Lipton and Longhurst, 1989; Rosegrant and Svendsen, 1993; Saleth, 2002). Indeed, the past five decades have witnessed a serious promotion of agricultural inputs business development in many developing Asian countries with the broad objectives of achieving food self-sufficiency, agricultural and rural development, and poverty and hunger reduction.

21. This subsection explores available opportunities for a similar input-led agricultural intensification in Africa, by reviewing the past and current status of agricultural input consumption, production and marketing in Africa in comparison to other world regions and within Africa itself. It is based on the premise that although much has been done to increase the use of yield-enhancing inputs in Africa, there is still great untapped potential in productivity (figure 6) and a lack of widespread adoption of these inputs (Kelly, Adesina and Gordon 2003).

Figure 6: Gap between actual and potential maize yields.



Source: Jayne et al. 2009.

(1) Fertilizer

Fertilizer production and consumption in Africa, as compared to the world

22. Fertilizer is a key agricultural input that shows immediate response and direct impact on crop yields. One kilogram of nitrogen delivered through fertilizer increases crop yields by 7-10 kg on average. On average, fertilizer production and consumption in sub-Saharan Africa is much less than in many other world regions (tables 1-4). In 2006-2007 for instance, total fertilizer production in Africa was 5.6 million mt. of nutrients, compared to 78.8 million mt. of nutrients in Asia, 85.5 million mt. in all developing countries and 77.3 million mt. in developed countries

because it has been both a public and a private good in Africa, whereas irrigation has historically been more of public good.

(table 1). The corresponding figures for total fertilizer consumed during the same period were 4.7 million mt. of nutrients in Africa, 92.1 million mt. in Asia, 108.6 million mt. in developing countries and 52.7 million mt. of nutrients in developed countries (table 3). Levels of fertilizer production and consumption in Africa are low and also growing at relatively slow rates.

Table 1: World: Fertilizer Production by Region

Area	1995/96				2005/06			
	N	P ₂ O ₅	K ₂ O	Total	N	P ₂ O ₅	K ₂ O	Total
	(millions of nutrients)							
North America ^b	18.3	10.9	8.8	38.0	10.8	10.1	8.9	29.7
Latin America	3.2	1.8	0.3	5.3	3.1	1.8	0.8	5.6
Western Europe	9.3	2.5	5.3	17.1	6.9	1.5	4.4	12.8
Eastern Europe	4.8	1.0	0.0	5.7	4.1	0.7	0.0	4.8
Former Soviet Union	8.5	2.7	5.7	16.8	9.5	3.3	11.3	24.1
Africa	2.6	2.3	0.0	4.9	2.9	2.6	0.0	5.6
Asia	39.5	11.7	2.6	53.9	55.4	17.9	5.5	78.8
Oceania	0.4	0.7	0.0	1.0	0.5	1.0	0.0	1.5
Developed ^c	42.5	18.6	21.1	82.2	32.9	17.6	26.8	77.3
Developing ^d	44.0	14.9	1.6	60.5	60.2	21.3	4.0	85.5
World	86.5	33.5	22.7	142.7	93.2	38.9	30.8	162.9

a. Total may not add due to rounding. Calendar year data for 2005 are included with 2005/06

b. Mexico included in Latin America

c. Developed countries include America, Western Europe, Eastern Europe, Eurasia, Israel, Japan South Africa, Australia and New Zealand.

d. Developing countries include Latin America, Asia (except Israel and Japan), Africa (except South Africa) and Oceania (except Australia and New Zealand).

Source: IFDC Africa Fertilizer Situation Report, January 2008

Table 2: World: Share of Fertilizer Production by Region and Annual Growth Rate, 1995/96 to 2005/06

Area	1995/96		2005/06		Annual Compound Growth Rate
	Total Fertilizer Production	World	Total Fertilizer Production	World	
	(millions of nutrients)	(%)	(millions of nutrients)	(%)	(%)
North America ^b	38.0	27	29.7	18	-2.4
Latin America	5.3	4	5.6	3	0.7
Western Europe	17.1	12	12.8	8	-2.8
Eastern Europe	5.7	4	4.8	3	-1.7
Former Soviet Union	16.8	12	24.1	15	3.6
Africa	4.9	3	5.6	3	1.2
Asia	53.9	38	78.8	48	3.9
Oceania	1.0	1	1.5	1	3.9
Developed ^c	82.2	58	77.3	47	-0.6
Developing ^d	60.5	42	88.5	53	3.5
World	142.7	100	162.9	100	1.3

a. Total may not add due to rounding. Calendar year data for 2005 are included with 2005/06

b. Mexico included in Latin America

c. Developed countries include America, Western Europe, Eastern Europe, Eurasia, Israel, Japan South Africa, Australia and New Zealand.

d. Developing countries include Latin America, Asia (except Israel and Japan), Africa (except South Africa) and Oceania (except Australia and New Zealand).

Source: IFDC Africa Fertilizer Situation Report, January 2008

Table 3: World: Fertilizer consumption by region

Area	1995/96				2005/06			
	N	P ₂ O ₅	K ₂ O	Total	N	P ₂ O ₅	K ₂ O	Total
	(millions of nutrients)							
North America ^b	12.7	4.8	5.1	22.6	12.7	4.8	4.6	22.1
Latin America	3.9	2.2	2.4	8.5	5.8	4.3	4.4	14.4
Western Europe	9.7	3.6	4.3	17.6	8.5	2.6	2.9	14.0
Eastern Europe	2.0	0.7	0.6	3.3	3.6	1.3	1.3	6.2
Former Soviet Union	2.6	0.8	0.9	4.3	2.0	1.1	1.5	4.6
Africa	2.1	0.9	0.4	3.5	3.3	1.0	0.4	4.7
Asia	44.5	16.3	6.5	67.3	57.0	21.0	14.0	92.1
Oceania	0.8	1.4	0.4	2.6	1.4	1.5	0.4	3.3
Developed ^c	28.8	12.1	12.0	52.9	29.2	12.2	11.4	52.7
Developing ^d	49.5	18.6	8.7	76.8	65.1	25.5	18.1	108.6
World	78.4	30.7	20.7	129.7	94.2	37.6	29.5	161.4

a. Total may not add due to rounding. Calendar year data for 2005 are included with 2005/06

b. Mexico included in Latin America

c. Developed countries include America, Western Europe, Eastern Europe, Eurasia, Israel, Japan South Africa, Australia and New Zealand.

d. Developing countries include Latin America, Asia (except Israel and Japan), Africa (except South Africa) and Oceania (except Australia and New Zealand)

Source: IFDC Africa Fertilizer Situation Report, January 2008

Table 4: World: Share of fertilizer consumption by region and annual growth rate, 1995/96 to 2005/06

Area	1995/96		2005/06		Annual Compound Growth Rate (%)
	Total Fertilizer Consumption	World	Total Fertilizer Consumption	World	
	(millions of nutrients)	(%)	(millions of nutrients)	(%)	
North America ^b	22.6	17	22.1	14	-0.2
Latin America	8.5	7	14.4	9	5.4
Western Europe	17.6	14	14.0	9	-2.3
Eastern Europe	3.3	3	6.2	4	6.5
Former Soviet Union	4.3	3	4.6	3	0.7
Africa	3.5	3	4.7	3	3.0
Asia	67.3	52	92.1	57	3.2
Oceania	2.6	2	3.3	2	2.5
Developed ^c	52.9	41	52.7	33	-0.0
Developing ^d	76.8	59	108.6	67	3.5
World	129.7	100	161.4	100	2.2

a. Total may not add due to rounding. Calendar year data for 2005 are included with 2005/06

b. Mexico included in Latin America

c. Developed countries include America, Western Europe, Eastern Europe, Eurasia, Israel, Japan South Africa, Australia and New Zealand.

d. Developing countries include Latin America, Asia (except Israel and Japan), Africa (except South Africa) and Oceania (except Australia and New Zealand).

Source: IFDC Africa Fertilizer Situation Report, January 2008

23. Nevertheless, Crawford et al., 2003 provide evidence that average fertilizer consumption in sub-Saharan Africa has increased since the 1980s. According to table 5, mean consumption levels were 16 per cent higher in the period 1996-2000 than during the 1980s. This increase in the early 1990s, occurred despite reductions in fertilizer subsidies and input credit. Fertilizer consumption by hectare of arable land also increased over the same period by five per cent.

Table 5: Mean fertilizer consumption in sub-Saharan Africa

Fertilizer consumption	1980-89	1990-95	1996-2000
Fertilizer consumption ('000 tons)			
Sub-Saharan Africa (SSA)	1088	1238	1264
SSA minus Nigeria, South Africa and Zimbabwe	677	716	922
Fertilizer consumption per hectare (kg)			
SSA	7.54	8.14	7.92
SSA minus Nigeria, South Africa and Zimbabwe	6.14	6.14	7.35

Source: Crawford et al., 2003.

24. There are many reasons for the difference in fertilizer production and consumption between Africa and the rest of the world. For one, fertilizer production is more expensive in Africa. This is a product of the small market for inputs in Africa compared to other regions. Africa accounts

for less than one per cent of the global fertilizer market, which prevents suppliers from being able to exploit economies of scale (Morris *et al.*, 2007). As a result, fertilizer prices in Africa as measured by the nitrogen-to-maize price ratio are typically double to triple those in several Asian and Latin American countries (Pinstrup-Andersen 1993, Heisey and Mwangi 1997).

Within Africa

Regional level

25. Within Africa, regional fertilizer consumption and production trends are heterogeneous (table 6, figures 7-9). In general, North Africa has been the main consumer of fertilizer, utilizing more than triple the total amount of any other region. Looking exclusively at sub-Saharan Africa, East Africa is the largest consumer of fertilizer. While all of the regions in Africa consume at least a small amount of fertilizer, they produce low quantities of fertilizer. The exception here is also North Africa, which is the only region in Africa to produce fertilizer material in sufficient quantities to satisfy domestic consumption needs. In fact, except for West Africa, most of the remaining regions in Africa do not produce any fertilizer material.

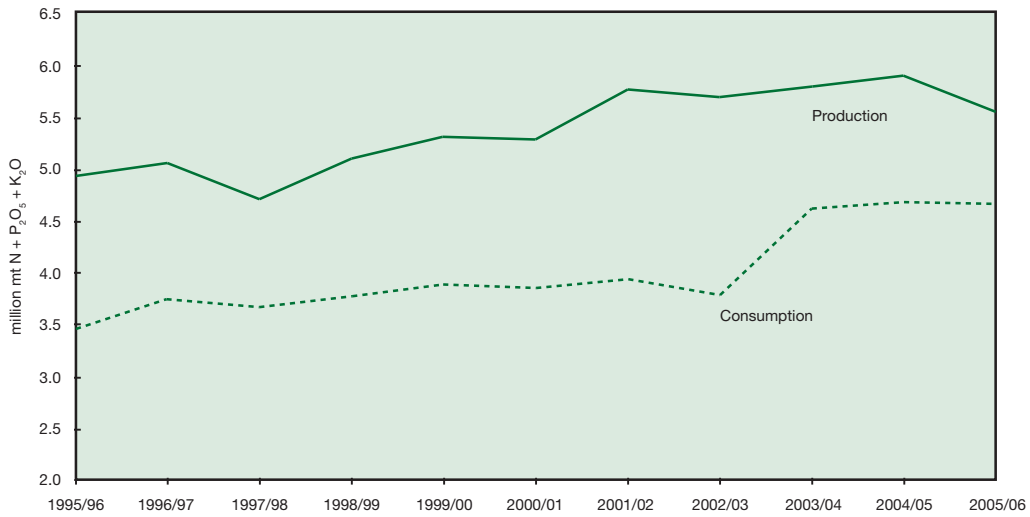
Table 6: Fertilizer consumption by African region and country, 2002-2007

Countries		Total Fertilizer Consumption (tonnes)					
		2002	2003	2004	2005	2006	2007
Southern Africa	Madagascar	13568	13450	14519	34932	15809	16200
	Malawi	209481	227391	251852	291876	374139	132603
	Mozambique	0	78450	22781	17055	50504	6190
	Namibia	7324	2675	7037	4087	6548	1932
	South Africa	355862	302895	318891	206438	144625	0
	Zambia	150855	165627	228141	145394	158330	70642
	Zimbabwe	8543	38761	35247	35318	0	0
	SA Average	122848	131748	140536	116630	124992	37927
	SA Total	747635	831252	880472	737105	751961	229574
East Africa	Burundi	2196	645	1827	5452	6748	2569
	Comoros	..	..	..	..	..	..
	Eritrea	0	0	0	3121	12	3648
	Ethiopia	314799	116310	196176	171428	369420	170095
	Kenya	360678	328610	451282	379178	397106	225101
	Mauritius	0	0	266	100	596	0
	Rwanda	0	0	4374	7554	3704	15740
	Seychelles	0	0	24	80	27	215
	Tanzania	91901	65244	100976	135737	147536	66900
	Uganda	16166	19564	16880	12353	16358	277
	East Africa average	87304	58930	85756	79445	104611	53838
	East Africa total	785740	530373	771805	715003	941507	484545

Countries		Total Fertilizer Consumption (tonnes)					
		2002	2003	2004	2005	2006	2007
West Africa	Benin	33063	2034	340	35	0	0
	Burkina Faso	1290	116127	126769	153913	18294	40742
	Côte d'Ivoire	259252	168387	238537	170004	248894	50642
	Gambia	0	7033	6500	8250	350	2339
	Ghana	64832	68545	98983	61653	129290	87985
	Guinea	6329	5318	10147	8956	7839	1914
	Mali	0	0	203	136	160	58
	Niger	20322	19337	15944	19694	10210	5380
	Nigeria	402223	118181	162420	539390	428519	34250
	Senegal	20	13944	29021	13484	13293	19696
	Togo	27243	39080	17415	45195	25573	30062
	WA Average	74052.18182	50726	64207	92792	80220	24824
	WA Total	814574	557986	706279	1020710	882422	273068
North Africa	Algeria	0	0	0	0	34417	179182
	Egypt	2653000	3668071	5301347	6047929	3941000	4857919
	Libya	127000	50000	151000	213000	129000	80000
	Morocco	0	0	400638	377161	836086	166756
	Sudan	118410	125000	162280	87000	51000	7000
	Tunisia	147357	182674	234721	281366	7000	28000
	NA Average	507628	670957.5	1041664	1167743	833084	886476
	NA Total	3045767	4025745	6249986	7006456	4998503	5318857
Central Africa	Angola	0	0	0	9000	30933	15471
	Cameroon	0	62151574	156711	96933	114334	26173
	Congo	0	0	2528	50	56	0
	Congo, Democratic Republic of	0	0	2986	793	4981	161
	Gabon	3831	2179	3511	4985	5184	1314
	CA Average	639	10358959	27623	18627	25915	7187
	CA Total	3831	62153753	165736	111761	155488	43119

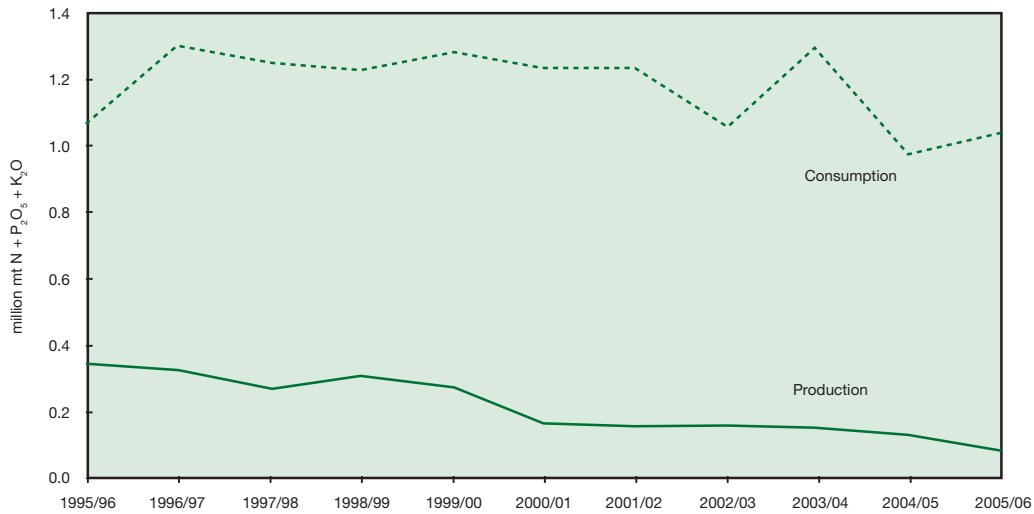
Source: FAOSTAT, 2009.

Figure 7: Africa: Total fertilizer production and consumption, 1995/96-2005/06



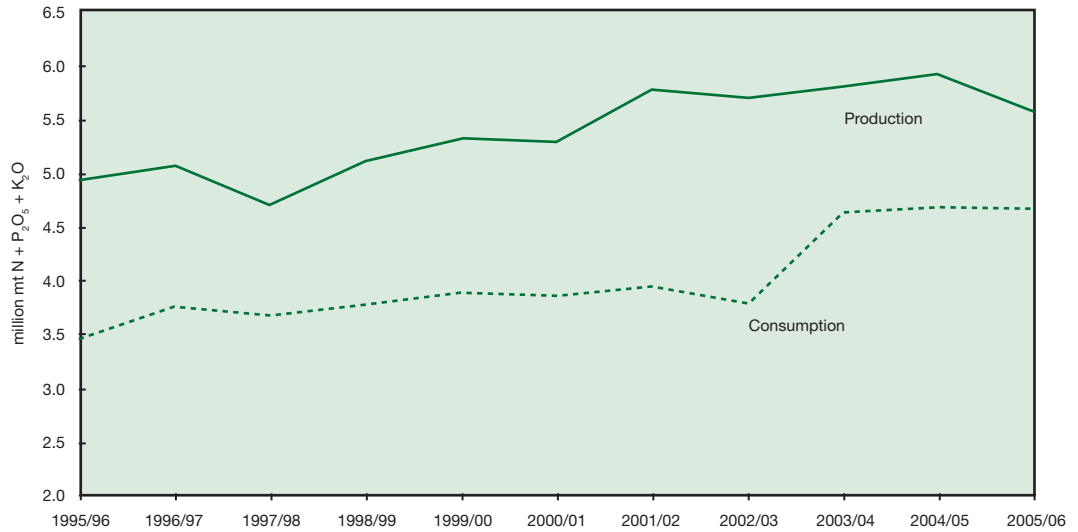
Source: IFDC Africa Fertilizer Situation Report, January 2008

Figure 8: Sub-Saharan Africa: Total fertilizer production and consumption, 1995/96-2005/06



Source: IFDC Africa Fertilizer Situation Report, January 2008

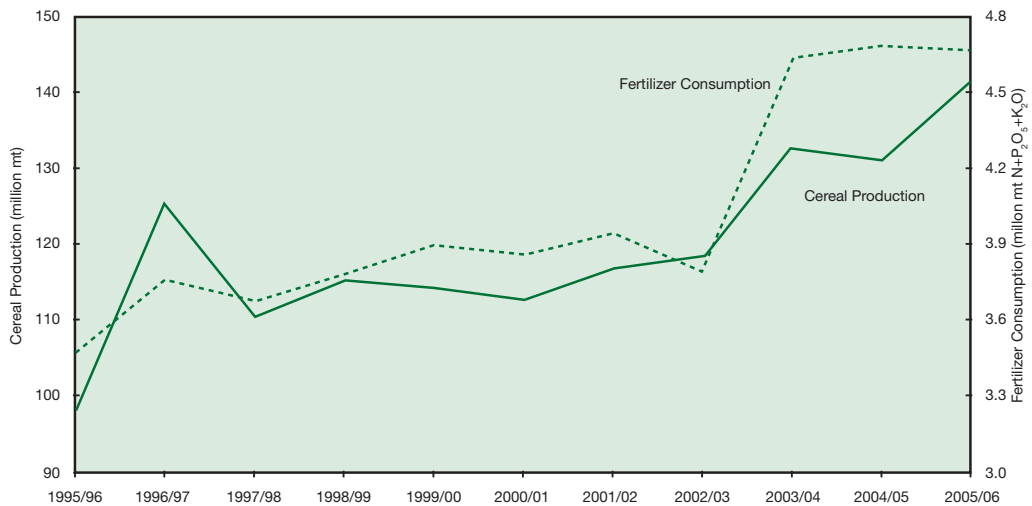
Figure 9: Non-sub-Saharan Africa: Total fertilizer production and consumption, 1995/96-2005/06



Source: IFDC Africa Fertilizer Situation Report, January 2008

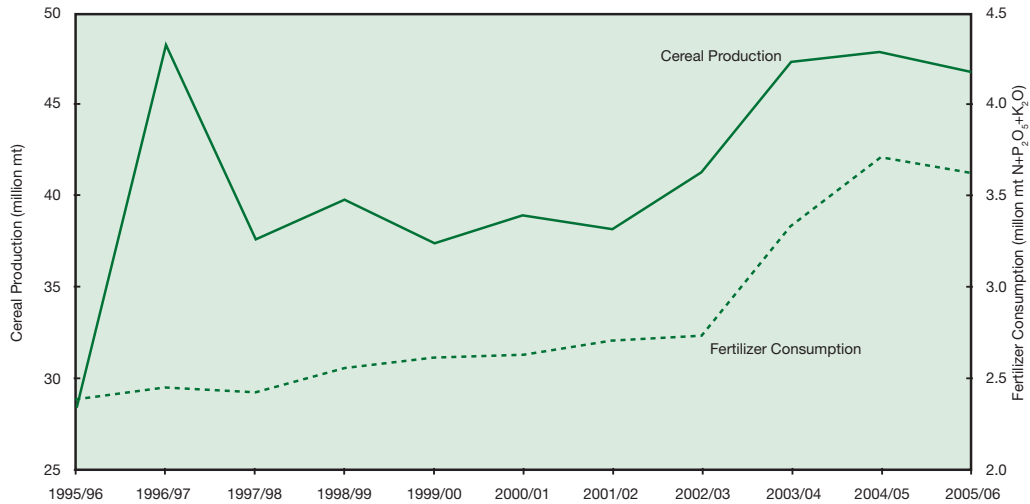
26. Because of the strong relationship between fertilizer application and crop yields, fertilizer consumption and crop yields (particularly cereal yields) normally are strongly correlated (see figures 10-12).

Figure 10: Africa: Total cereal production and total fertilizer consumption, 1995/96-2005/06



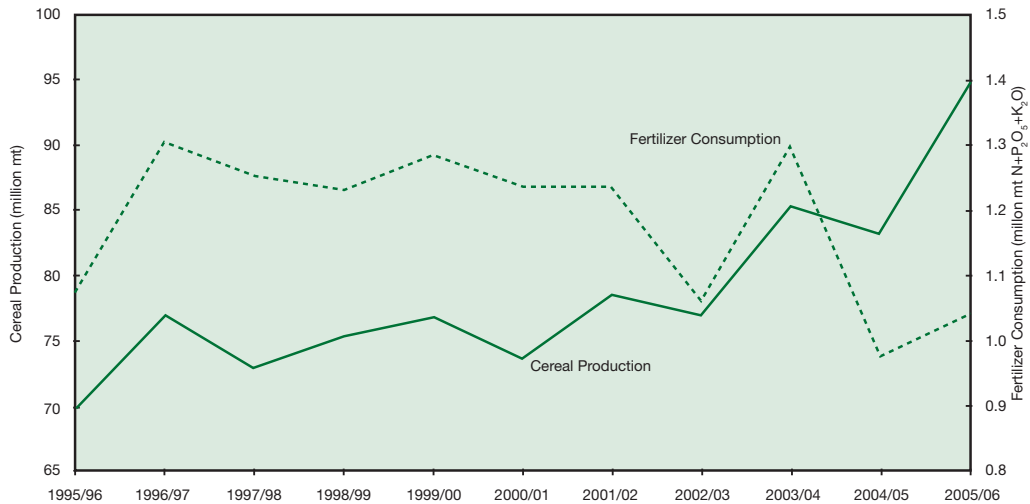
Source: IFDC Africa Fertilizer Situation Report, January 2008

Figure 11: Non-sub-Saharan Africa: Total cereal production and total fertilizer consumption, 1995/96-2005/06



Source: IFDC Africa Fertilizer Situation Report, January 2008

Figure 12: Sub-Saharan Africa: Total cereal production and total fertilizer consumption, 1995/96-2005/06



Source: IFDC Africa Fertilizer Situation Report, January 2008

27. Since most African regions do not produce their own fertilizer, they depend on imports. The largest consumers are also the largest importers, with North Africa and East Africa topping

the list (table 7). Yet, despite the low domestic fertilizer production and the total reliance on imports for consumption needs, many African regions also export fertilizer. The data seem to indicate that any imported fertilizer that is left over after annual consumption needs are met is then recycled back into international markets as exported material. Some countries do not do this, and instead use the surplus in the following year.

Table 7: Africa: Fertilizer imports and exports by region, 2002-2007

Countries	Total Fertilizer Imports (tons)						Total Fertilizer Exports (tons)					
	2002	2003	2004	2005	2006	2007	2002	2003	2004	2005	2006	2007
Central Africa												
Angola	0	7000	0	14000	30954	28183	0	0	0	0	0	0
Cameroon	0	90208	157317	96933	115034	74543	0	0	0	0	0	0
Congo	0	0	2528	50	56	0	0	0	0	0	0	0
Congo, DR	0	0	3519	1290	6359	1406	0	0	0	0	0	0
Gabon	3919	2299	3511	4985	5184	3007	88	120	0	0	0	0
CA Total	3919	99507	166875	117258	157587	107139	88	120	0	0	0	0
Burundi	4331	31	471	445	8815	3570	0	0	0	0	0	0
Comoros	0	0	0	0	0	0	..	..	..	..	..	..
Eritrea	0	2150	13	3121	34	3663	0	0	0	0	0	0
Ethiopia	314797	116314	0	0	0	306709	0	0	0	0	0	0
Kenya	373165	346423	454566	381344	400485	288740	12847	18329	742	1697	3403	7298
Mauritius	43739	63854	48455	59517	54683	39989	38104	36765	37309	11461	3238	6987
Rwanda	0	0	4419	7554	8549	17451	0	0	0	0	0	0
Seychelles	0	0	152	111	99	162	0	0	0	0	0	0
Tanzania	109419	91777	164554	205793	160594	163533	121	5580	15556	1435	13453	40322
Uganda	16166	19732	17077	12359	16448	6487	0	168	255	6	90	30
EA total	861617	640281	689707	669244	647707	830304	51072	60842	53862	14599	20184	54637
Algeria	118930	136844	166133	151216	143319	43052	244891	380431	299354	360444	53471	250
Egypt	0	148821	9691	8477	246000	2604031	1155000	254718	1615	11568	2069000	3348000
Libya	0	0	80000	80000	80000	80000	718000	775000	758000	702000	778000	0
Morocco	674200	608923	701952	472920	581563	47785	1762488	1709985	2031883	1922667	2167382	1544000
Sudan	118410	125000	162280	87000	7000	1000	0	0	0	0	0	0
Tunisia	32127	37265	28183	15564	7000	7006	1310411	1336603	1290462	1030203	1991000	1795000
NA Total	943667	1056853	1148239	815077	1064902	2782874	5190790	4456737	4381314	4026882	7058853	6687250
North Africa												

Countries	Total Fertilizer Imports (tons)							Total Fertilizer Exports (tons)						
	2002	2003	2004	2005	2006	2007	2002	2003	2004	2005	2006	2007		
Madagascar	13630	13452	14519	34932	15809	21104	62	2	0	0	0	0		
Malawi	111725	132357	87465	207237	134091	242844	1087	1713	2182	1032	0	60		
Mozambique	0	78450	23160	17055	50504	30267	0	0	0	0	0	0		
Namibia	7383	2735	8265	4304	6598	5326	58	60	1237	217	50	373		
South Africa	1256885	884900	1136882	855286	1216546	1313977	550926	551599	402069	553849	455602	402661		
Zambia	152824	170299	237069	146282	162985	324837	1970	2715	23685	888	4585	14465		
Zimbabwe	68856	154519	56284	63033	161004	44371	14982	8117	8900	5654	6545	16140		
SA Total	1611303	1436712	1563654	1328129	1747537	1982726	569085	564206	438073	561640	466782	433699		
Benin	88476	4729	341	35	0	0	0	0	5490	0	0	0		
Burkina Faso	10842	104921	213995	217230	18303	55684	84	0	18	0	0	1654		
Côte d'Ivoire	298131	182524	245610	216815	254574	196241	172473	63741	102275	139166	143922	59578		
Gambia	0	7033	6500	8250	350	2339	0	0	0	0	0	0		
Ghana	64832	68545	98983	61653	129290	163137	0	0	0	0	0	0		
Guinea	6329	5318	10147	8956	7839	8801	0	0	0	0	0	0		
Mali	0	0	203	136	160	102	0	0	0	0	0	0		
Niger	21352	12158	6041	15112	12439	5364	1154	0	4	0	0	0		
Nigeria	402223	118181	162420	539390	428519	146593	0	0	0	0	0	0		
Senegal	45089	20606	57623	18888	22342	51787	40126	1700	3550	0	2000	14725		
Togo	27274	39080	17415	45200	25573	32211	31	0	0	0	0	0		
WA Total	964548	563095	819478	1131665	899389	662259	213868	65441	111337	139166	145922	75957		

Source: FAOSTAT, 2009.

28. Another overarching trend observed across the regions is the steady growth in consumption from 2002 to 2006, with a drastic drop-off in 2007. For example, in East Africa the total fertilizer consumption grew from 1.17 million tons in 2002 to 1.54 in 2006 but dropped off to 0.7 million in 2007. This drop off in demand is likely due to the increase in world commodity prices in 2007 and the subsequent 200 per cent price increase in fertilizer (IFDC, 2008).

Country level

29. Consumption trends indicate an overall low level of fertilizer consumption across countries, with a few key countries serving as the larger users (table 7). In East Africa, Ethiopia (24 per cent of total fertilizer consumption in the region), Kenya (32 per cent) and Malawi (19 per cent) are major consumers. In Southern Africa, only two countries reported consumption of fertilizer – Namibia and South Africa – with South Africa taking the lion's share on a par with levels observed in Kenya. In West Africa, fertilizer consumption is a bit more evenly spread across countries with the exception of Mali and Benin. Burkina Faso, Côte d'Ivoire, Ghana and Nigeria are the major consumers of the region. Much like Southern Africa, Central Africa has few countries that are actually consuming fertilizer and much of that use is concentrated in just two countries – Angola and Cameroon.

30. Out of the 17 African countries that are fairly major consumers of fertilizer, eight – Benin, Burkina Faso, Chad, Côte d'Ivoire, Kenya, Ethiopia, Togo and Senegal – increased consumption by 45 per cent or more over the period 1980-89 and 1996-2000 (Crawford *et al.* 2003).⁴ In most of these countries, the increase was due to an increase in crop area, while in others it was due to an expansion of the crop being fertilized (in this case, cotton). In eight other countries – Cameroon, Ghana, Madagascar, Malawi, Nigeria, the United Republic of Tanzania, Zambia and Zimbabwe – fertilizer use stagnated or declined over this period. Most of these countries experienced a decline because the high subsidies of the 1980s were removed.

Household level

31. The majority of households in most African countries do not consume fertilizer. In the 1990s, only two countries for which data was available had fertilizer adoption rates of 50 per cent or more (Kenya and Benin) (Kherallah *et al.* 2002). There are consistent and predictable determinants of fertilizer consumption at the household level. Most include household resources, suggesting that the decision is subject to cash and credit constraints as well as risk aversion (Kherallah *et al.* 2002).

⁴ Major fertilizer consumers are defined by Crawford *et al.* 2003 as consuming at least 10,000 tons per year. The 17 countries are Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Mali, Nigeria, Senegal, the United Republic of Tanzania, Togo, Zambia and Zimbabwe. Crawford *et al.* 2003 excluded South Africa, but based on their definition, the country would fall into this category.

Table 8: Percentage of farmers consuming fertilizer by country, 1990s (various years)

Country	Percentage of farmers consuming fertilizer	Year
Benin	50	1998
Cameroon	22	1990
Ethiopia	33	1995
Ghana	14	1987
Kenya	61	1996
Malawi	35	1998
Tanzania	27	1991
Tanzania	15	1994
Zambia	31	1986
Zimbabwe	19	1989

Source: Kherallah et al. 2002.

32. One of the reasons for the high price of fertilizer in Africa is the expensive bottlenecks from import to farm gate. When suppliers incur high transaction and marketing costs in supplying inputs to farmers, they will either choose not to do so because the expenses eat too much into their profits or they will pass the extra costs onto farmers in the form of higher prices. In many countries, domestic marketing costs account for 50 per cent or more of the farm gate price of fertilizer (Jayne *et al.* 2003).

33. Table 9 shows the price structures for urea (fertilizer type) from the point of import in Malawi, Zambia and Ethiopia to the farm gate. The figures show that the farm gate price for urea is more than double the CIF price in Ethiopia and triple the CIF prices in Zambia and Malawi.⁵ In all three countries, a large share of the marketing costs was borne at the port, with the exception of Malawi, which experienced almost equal costs at and after the port. Of these costs, the majority were spent on inland transport, handling and storage, which are then passed onto farmers via higher prices. It appears as if domestic marketing costs are lower in Ethiopia but the costs of various retailing functions handled by the government were not included (Stepanek, 1999).

⁵ CIF refers to cargo, insurance and freight before off-loading at the port.

Table 9: Financial price structures for fertilizer from import to farm gate, 1998-99

Price components	Malawi	Zambia	Ethiopia
CIF price at import point	126.50	133.00	125.00
Taxes	2.94	2.00	0.00
Port handling	8.50	5.50	12.57
Bagging	21.00	17.00	4.55
Port storage	1.50	3.00	0.74
Inland transport, handling, storage	82.60	166.50	99.91
Export Marketing Costs			
Financing/capital cost	41.89	12.90	7.03
Markup/margins	113.93	27.80	5.80
Farm-gate price	398.86	368.00	255.60
Total Domestic Marketing costs	272.36	234.70	130.60
% of farm-gate price	68.285	63.777	51.0955

Source: Kelly, Crawford and Jayne 2003; and Jayne et al. 2003

(2) Irrigation

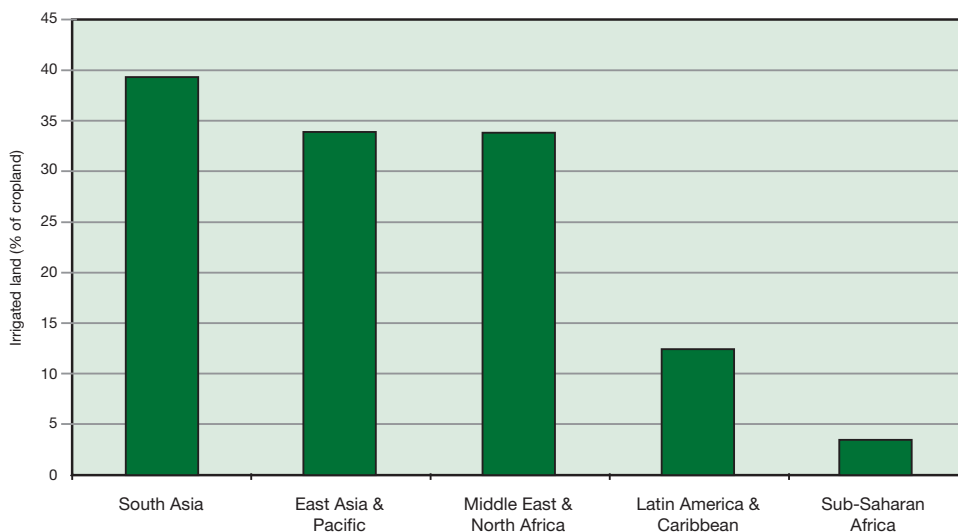
34. The United Nations World Water Assessment Programme (2003) estimates that about 20 per cent of global arable land is irrigated and contributes to about 60 per cent of the global production of cereal crops. In the literature on irrigated agriculture, increased irrigation leads to increased agricultural productivity and increased food supplies with reductions in poverty. Increased irrigation is a necessary condition for extra food production or increased crop yield. For almost three decades, a large body of literature (Hekstra, 1983; Underhill, 1984; Moris *et al.*, 1984; Miller and Tillson, 1989; Kay, 1990; FAO, 1985; Brown *et al.*, 1985; Cornish, 1998; FAO, 2000b; Janaiah *et al.*, 2000; Seckler and Sampath, 1989; Bhattarai *et al.*, 2002; Lankford, 2002; Peacock, 2005; Van Koppen *et al.*, 2005, *etc.*) have tended to show that smallholder irrigation investments have increased agricultural production and improved crop yield.

35. Although the translation of the effect of irrigated agriculture into food security in Asia is currently receiving attention in literature, it remains under-researched in sub-Saharan Africa⁶. Despite large investments in irrigation development in sub-Saharan Africa, comprehensive studies of profitability of investments in irrigation development are rare. The dearth of such comprehensive studies in Africa may be due to the fact that: (a) irrigation investments are only just starting in sub-Saharan Africa; and (b) the lack of temporally and spatially disaggregated data prevents theoretical and empirical analysis of the linkages between irrigation investments and food security in sub-Saharan Africa (Van Koppen *et al.*, 2005).

6 See Samad (2002) for the overview of International Water Management Institute's research results of the impact of water resources development on poverty

36. Irrigation levels in Africa are also low compared to other world regions, with just 3.5 per cent of total crop land currently under irrigation compared to 39.2 per cent in South Asia (figure 15). Not only are levels low compared to other regions, but the rate of expansion is also slower than in any other region. Over the last forty years, only four million hectares of new irrigation has been developed in sub-Saharan Africa, compared to 25 million new hectares in China and 32 million in India (African Development Bank 2007). Irrigated cereal yields achieved by smallholders in SSA are also generally low and growing slowly by global standards (African Development Bank, 2007).

Figure 13: Share of crop land that is irrigated by world region, 2003

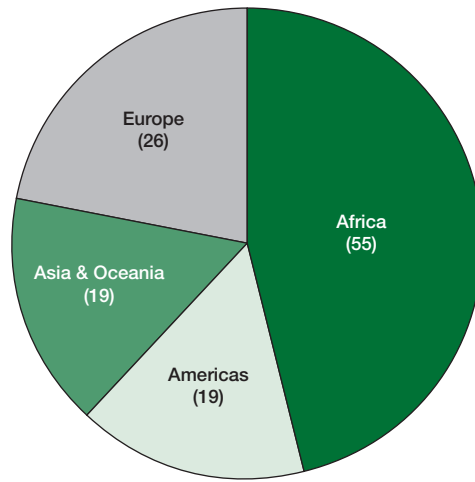


Source: WDI, 2008. Figure for East Asia and Pacific is from African Development Bank, 2007.

37. Irrigation has received recognition throughout the developing world since the colonial period as a drought proofing development strategy and as a vehicle for lasting agricultural development of a country. The world's net irrigated area was 229 million hectares in 1988. Sixty-two per cent, or 143 million hectares of the total global irrigated area is accounted for by the Asian continent alone (Rosegrant and Svendsen, 1993). Figure 14 presents the number of people per irrigated hectare in four major regions of the world: Africa, the Americas, Asia and Oceania, and Europe⁷. If, according to Carter (2003), access to irrigated land is considered as a rather crude measure of a region's well-being, then from Figure 14, the rest of the world is two or three times better off than Africa.

⁷ The basic data used for figure 16, which are generated by the International Commission on Irrigation and Drainage, consist of only the participating countries of the International Commission on Irrigation and Drainage (ICID, 2003).

Figure 14: Regional Populations per Irrigated Hectare



Source: Carter (2003)

38. The African continent witnessed its first major experience with irrigation for food production in the Sudanese Gezira scheme and other places after a century of irrigation experience in India (Adams, 1990). Apart from the Sudan, only a very small area of Africa witnessed irrigation development during the colonial era. At present, only three per cent of the cropland in Africa is irrigated compared to 40 per cent of irrigated cropland in Asia (Litchfield *et al.*, 2002). Since the attainment of political independence in many African countries in the 1960s, the international development agencies have partnered with national governments to take over irrigation in Africa, focusing on river basin planning as an option for improving crop and food production to feed the rapidly growing population of the region (Moris *et al.*, 1984; Kay, 2001). Consequently, there were massive investments in large-scale irrigation schemes throughout the 1970s and 1980s in sub-Saharan Africa.

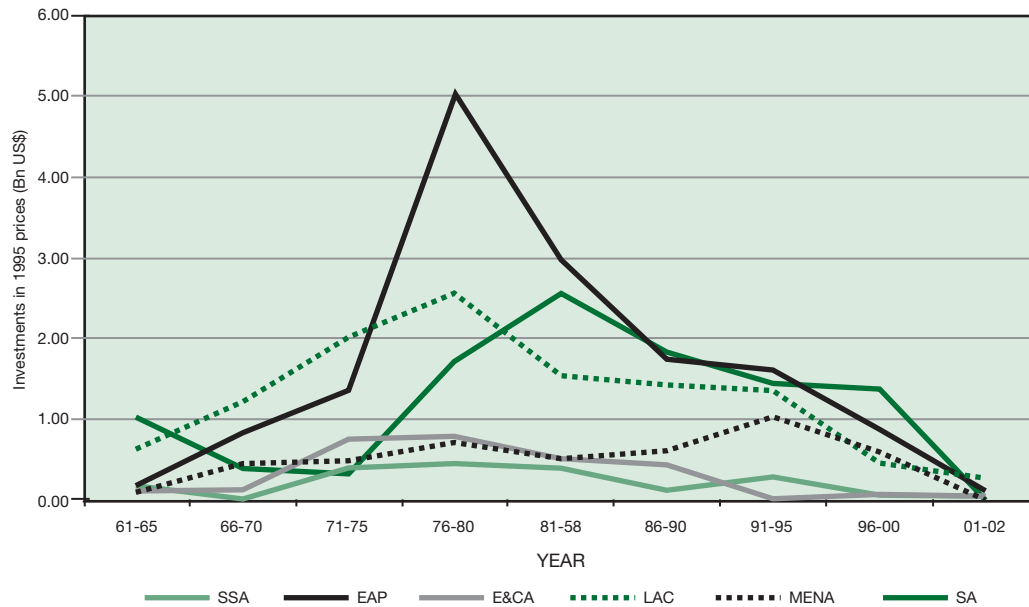
39. Donor-financed irrigation development schemes in sub-Saharan Africa were in form of medium and large-scale public irrigation schemes rather than small-scale irrigation schemes, which were formally controlled and managed by government bodies. The formal medium and large-scale public irrigation schemes have been widely criticized because of their high economic and social cost that has resulted in their disappointing performance and have rendered them ineffective in providing efficient, equitable and sustainable development (Kay, 2001). It has also been shown that their capital costs were extremely high in relation to returns with associated technical problems (Adams, 1991; Carter, 1992). For instance, Adams (1991) argues that the record of formal, large-scale irrigation in Africa is extremely poor; with costs exceeding budget, and production costs rarely being met. Management problems have also been attributed to the failure of many large-scale schemes. The *Office du Niger* irrigation schemes in Mali are typical examples of where management problems have led to poor performance of large-scale irrigation schemes associated with low returns (Rosegrant and Perez, 1997). Faulty design and planning

of large-scale irrigation schemes from the initiation of such irrigation investments and political issues have also been cited as reasons for the failure of many large-scale irrigation schemes in sub-Saharan Africa (see, for instance, Lele and Subramanian 1990; Rosegrant and Perez, 1997; Palmer-Jones, 1987).

40. Furthermore, many of the beneficiaries of large-scale irrigation schemes in Africa hardly pay any money for water delivery, and even when they do pay, the levied water charges rarely meet the cost of energy for water delivery. This is because of the general assumption by many beneficiary farmers that water ought to be free. The large-scale irrigation schemes or large dams in Africa have also been criticized for their negative rather than positive downstream socio-economic and environmental impacts. The negative socio-economic and environmental impacts of large-scale irrigation or large dams, which are well documented, include, forced displacement of large groups of people, decline of downstream fishing due to flood control, negative health effects associated with water-borne diseases such as malaria, loss of natural habitat, water loss, salinity and water logging (Adams, 2000; Thomas and Adams, 1999).

41. Consequently, investment in agricultural water management via large-scale irrigation schemes has slumped dramatically due to a sharp decline in lending for large-scale irrigation by donor agencies. As shown in figure 15, there were general declines in historical figures on lending for irrigation development and drainage in all regions of the world between 1961 and 2002. In particular, donor lending for investments in large-scale irrigation development in the Asian continent slumped very drastically while sub-Saharan Africa also witnessed a decreasing trend in irrigation investments from 1981 to 2002, having enjoyed increasing trends in irrigation investments from 1971 to 1981.

Figure 15: Trends in investments in irrigation and drainage, 1961-2002

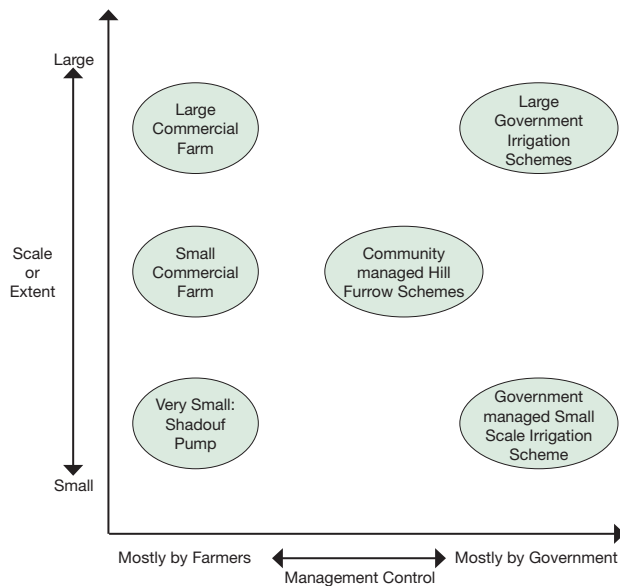


Source: IWMI (2004)

Sources of data are the World Bank, Asian Development Bank and Inter-American Development Bank. SSA stands for sub-Saharan Africa, EAP for East Asia and the Pacific, E&CA for Europe and Central Asia, LAC for Latin America and the Caribbean, MENA for Middle East and North Africa, and SA for South Asia.

42. The dismal performances of many large-scale irrigation schemes have been used by scholars, development agencies and policy-makers to promote the informal sector, farmer-managed, small-scale or smallholder irrigation, or what Adams and Anderson (1988) call “small is beautiful” schools of development thinking. This is because the areas of land irrigated by farmers, without help from governments and donor agencies, in many developing countries, using traditional systems of water management far surpassed the large-scale irrigation schemes developed by the latter, and at much lower cost (Carter, 2003). Adams (1990) provides a useful diagrammatic relationship between scale and form of control in irrigation, as presented in figure 16. While very small-scale irrigation schemes managed by individual private investors are at one end of the range, large government-managed irrigation schemes are at the other. The relations between scale and form of control in irrigation also show that while some individual farmers control small and large commercial farms, governments also deal with small-scale irrigation schemes.

Figure 16: Relations between Scale and Form of Control in Irrigation



Source: Adams (1990)

43. Among others, Chambers *et al* (1989) and Rijsberman (2003) have argued that a growing body of evidence had shown that support to small-scale, privately managed groundwater irrigation targets poor rural farming households better than other poverty-reduction interventions and enriches more livelihoods than large government-managed irrigation schemes.

44. Although some analysts (Adams and Carter, 1987; Palmer-Jones, 1987; Adams, 1990) have challenged the fact that the dilemma with past large-scale irrigation development is primarily one of scale, investment in smallholder irrigation is now the order of the day in many developing countries, particularly in sub-Saharan African countries. It is now claimed that there are many smallholder irrigation development success stories, particularly where smallholders have either invested in small-scale irrigation themselves or are fully involved in such irrigation development as beneficiaries (see, for instance, Kay, 2001; Rijsberman, 2003; Van Koppen *et al.*, 2005).

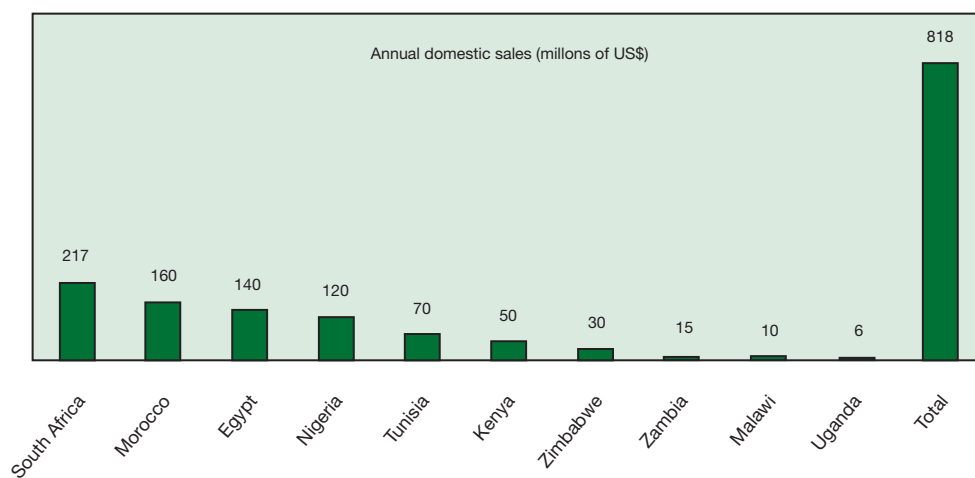
Improved seed

45. Improved seed is an important yield-enhancing input, because it is the delivery vehicle for modern plant varieties. The development and spread of modern plant varieties was the technological force behind the green revolutions that occurred in China, India, Southwest Asia, and many parts of Latin America. In Africa, demand for improved seed rose steadily during the 1970s and 1980s. Despite this growth in demand, only about 5 to 10 per cent of the potential demand for improved seed is currently being met. Most farmers continue to plant unimproved seed obtained from local sources, including seed saved from the farmers' own crops,

from neighbours or relatives, or purchased in local markets (Cromwell *et al.*, 1992, Jafee and Srivastava 1994, Louwaars and Marrewijk, 1999).

46. The commercial sector for seed provision is underdeveloped in Africa. Less than two per cent of the estimated levels of the international seed trade occur in the national and regional markets in sub-Saharan Africa (FAO, 1998). In addition, the majority of this occurs in just one region – Southern Africa – and in just a handful of countries. South Africa alone accounts for nearly one third of all commercial seed sales in SSA, with Kenya and Zimbabwe respectively accounting for 18 and 5 per cent (International Seed Federation 2003). Beyond being concentrated in just a few countries, commercial seed sales in Africa are also concentrated in a narrow range of crops, particularly hybrid maize (Rohrbach *et al.*, 2003). Strikingly, the production and distribution of improved seed in Africa continues to be the domain of public agencies.

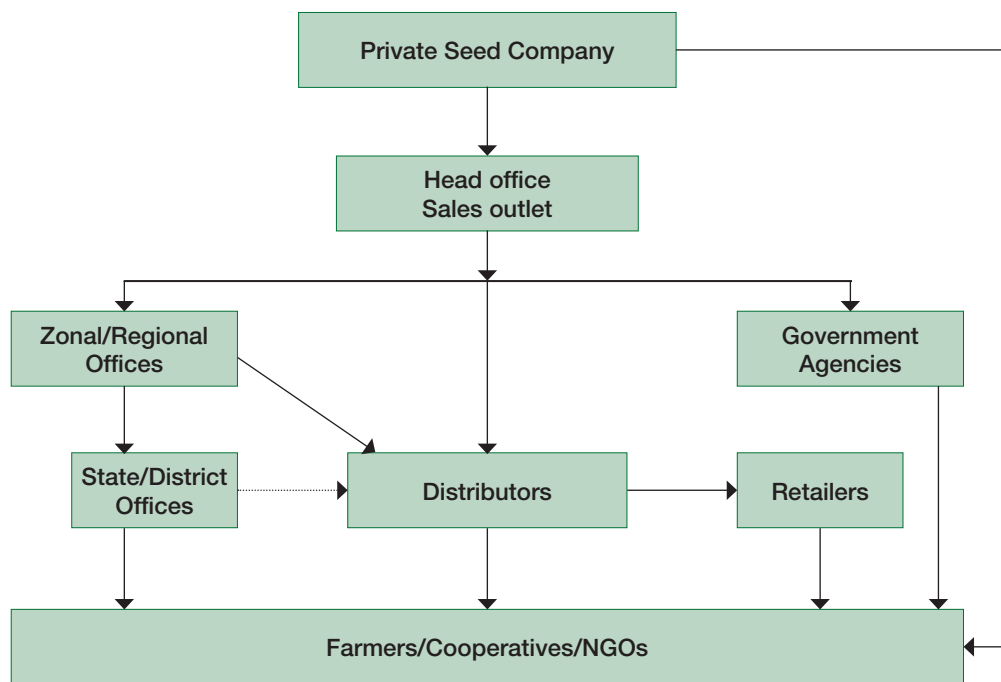
Figure 17: The Biggest Seed Markets in Africa (2005)



Source: <http://www.grain.org/seedling>

47. Even though plant varietal research and seed production and distribution in Africa are dominated by public agencies, a number of private companies have developed agro-dealer networks for the sale of improved seeds on the continent. Figure 18 depicts a typical private-sector seed distribution network. However, the volume of seed being sold through private companies is relatively modest. Only about 10–15 per cent of agro-dealers distribute improved seeds. Because of the lack of a well-developed network of seed agro-dealers in Africa, it has been difficult to achieve large-scale adoption of improved seed varieties.

Figure 18: Private sector seed distribution network



48. In terms of market structure and performance, procurement and marketing of seeds by the private sector in Africa is dominated by several large companies, most of which receive support from their parent companies based in Europe and America. The companies supply African governments, which in turn distribute seeds through field offices. The companies also sell directly to registered local distributors. The registered distributors, who act as wholesaler-retailers, supply to large-scale farmers either directly or through local retail agents. In recent years, the volume of seeds distributed in Africa has declined, reflecting weak demand on the part of farmers that in turn has undermined the profitability for suppliers.

III. A Review of Agricultural Input Business Development Policies, Constraints and Existing Public-Private-Partnerships (PPPs) in Africa

3.1 Agricultural input business development policies and constraints in Africa: review

49. While agricultural inputs have played a dominant role in increasing agricultural growth in other regions of the world, the same could not be said for Africa over the last 40 years. This chapter first reviews past policies that have supported or undermined agricultural input business development in Africa. The constraints to input adoption and market development are laid out in detail in the chapter. Key opportunities for governments and the private sector in input business development are then summarized.

3.1.1 Past policies and support actions in agricultural input development in Africa

50. In this subsection, previous agricultural input policies in Africa will generally be defined in terms of two periods: the pre-reform period of the 1970s and early 1980s and the reform period of the 1980s and early 1990s. The specific policies carried out in these two periods differ by country, although there are broad similarities across countries that will be summarized here. These policies are also important in shaping today's political environment toward inputs (which continues to be varied across countries) because there are remnants of both eras in each country's agricultural input strategy. Increasingly, there is also a return to the policies of the pre-reform period so it is crucial to review this period to avoid repeating the same mistakes.

Pre-reform period

51. In the 1960s and 1970s, donors and African governments relied heavily on input subsidies and provision of complementary services such as marketing, infrastructure, extension, research and the establishment of input and commodity marketing parastatals. Many of the policies during this period were implemented in order to support the activities of the State and State enterprises in input provision (Timmer, 1986, 1989; Delgado and Mellor, 1984). The justification for these actions is evident when viewed in the context of the period. The oil shock of the 1970s had just driven up the price of fertilizer to levels unaffordable by most African farmers. Many African countries had a general mistrust of the ability of markets to provide key services and inputs. It was believed that agricultural development would have to occur on a large "modern" scale and that the State would be the most efficient manager of such commercial activities. Therefore, the government became the main controller of input production, marketing, distribution and credit supply.

52. Adopting the characterization from *Kherallah et al.* 2002, the policies of this period can be summarized into four main points. First, agricultural input production and distribution were directly or indirectly controlled by the government and heavily regulated (Kherallah et al. 2002, Tripp and Rohrbach 2001). During this period, at least 30 out of 39 African countries surveyed reported that input distribution was controlled by a State monopoly (Kherallah et al. 2002). The allocation of agricultural inputs, particularly fertilizer, was determined administratively, often on arbitrary reasons such as usage in previous years. Seeds were and continue to be produced, multiplied and distributed by parastatals at extremely high costs. Seeds were also heavily regulated by national agencies with strict quality standards that serve to perpetuate the State monopoly control over the multiplication. In many countries, even to this day, only specific seed varieties that have been approved by the official variety release committee can be sold. In addition, many governments continue to distribute seed at extremely low prices or for free as part of emergency relief programmes that in some cases are not halted after the emergency has passed (Tripp and Rohrbach 2001).

53. Secondly, agricultural inputs were heavily subsidized by the government. In many cases, seeds were distributed for free, implying a 100 per cent subsidy. Fertilizer subsidies ranged from 10 to 80 per cent of the full cost of the fertilizer (Kherallah et al. 2002). During this period, 24 out of 26 African countries surveyed had at least “some” fertilizer subsidies (World Bank, 1994).

54. Third, governments often provided agricultural inputs to farmers on credit. Although there had been much effort at targeting these loans to smallholders, in most cases they ended up in the hands of larger farmers and commercial cash crop growers (Kherallah et al. 2002).

55. Fourth, in-kind aid from donors represented a high proportion of fertilizer imports during this period. This caused inconsistencies in the level and frequency of fertilizer availability, disrupted private sector interest in providing fertilizer and limited the varieties that were available for farmers to choose from.

56. The impacts of these kinds of policies are hardly surprising. These policies supported the public provision of seeds and fertilizer at the expense of the development of a commercial sector, which is specifically what they were designed to do. The unintentional consequences were that these programmes were highly economically inefficient, expensive and only able to survive as long as they were supported by donor funding or in-kind aid. In addition, although many elements were justified on equity grounds (such as subsidies), they were most often ill-targeted or used instead for patronage purposes, which isolated private sector stakeholders from access to the inputs needed to increase productivity and incomes.

Input market reform

57. The severe macroeconomic imbalances that resulted from the pre-reform policies led many countries to try out market reforms in the mid-1980s. Although each country followed a unique path, the major sector-specific reforms were the removal of fertilizer subsidies and price controls and the liberalization of fertilizer importation and distribution to private companies (Kherallah et al., 2002). By 1992, 17 out of 27 countries surveyed had removed subsidies and 23 had liberalized fertilizer marketing (World Bank, 1994).

58. This is not to say that these changes were permanent in every country. Some countries removed fertilizer support only to reestablish it years later in a permuted form. For example, Malawi removed fertilizer subsidies in 1995-96, but has since instituted a Starter Pack Initiative that involves the distribution of small amounts of inputs for free (Kherallah et al. 2002). Ethiopia has also phased out official fertilizer subsidies and government-controlled distribution, yet the government still plays a significant role in the provision of inputs.

59. Although many analysts have questioned the input market reform in Africa (Jayne et al., 2002; Dorward et al., 1998; Kydd et al., 2002), some authors illustrate that such reforms have resulted in the reduction of marketing margins, leading to better market integration, increased agricultural productivity and reduced transaction costs (Kherallah et al., 2000). The impacts of agricultural input reform have fallen somewhere between optimistic hopes and pessimistic concerns. Marketing costs are significantly lower in several countries than they would have been if the State-controlled programmes had continued to exist. For example, even under limited liberalization in Benin, the share of marketing costs over the CIF price fell from 40 to 50 per cent to just 25 per cent (Kherallah et al. 2002).

60. Kherallah et al. 2002 also looked at the impact of the reforms on fertilizer use. On aggregate, annual fertilizer use in SSA grew by 5 per cent from 1970 to 1993. This varies widely by country, however, with some experiencing a decline in usage rates following reforms (e.g., Rwanda and Somalia, which also experienced conflict during this period and had a low level of fertilizer use to begin with). In the majority of countries that use more than 10,000 tons of nutrients per year, fertilizer use increased in 14 out of 21 after reforms. In the countries that saw major declines in fertilizer use after reforms, most had significant reductions in subsidies or highly overvalued exchange rates. Another determining factor in the impact on fertilizer use was the proportion of fertilizer that was applied to tradable crops prior to the reforms. In general, countries using a large share of fertilizer on tradables saw less of an effect on fertilizer demand, and possibly even an increase in demand, than those that applied most of their fertilizer to non-tradables. This is because the real currency depreciation following macroeconomic reforms reduced incentives to apply fertilizer to non-tradables.

61. The removal of subsidies did not have a significant impact on agricultural output, mostly because application rates of agricultural inputs were so low in Africa to begin with. Since input subsidies were not effectively reaching the poorest households in the first place, their removal also

did not have any effect on poverty and rural incomes. It is now clear that increasing agricultural productivity requires efficient, effective, and timely supply and distribution of inputs. To complement this, appropriate technology transfer in the area of improved seed varieties, and the use of environmentally friendly agro-chemicals are imperative.

3.1.2 Constraints to effectiveness of past agricultural input business development policies

62. As illustrated in the previous section, successive African governments have made efforts to strengthen agricultural input development on the continent through the introduction of several policies and support actions. However, most of these have not aided in strengthening agricultural input development in Africa. The policies lacked targeting strategies to reach various categories of input suppliers and strictly followed a top-down planning process, in that all decision-making on their implementation emanated from the implementing agencies, with no apparent involvement of the private sector in policy planning, preparation and implementation.

63. Due to the nature of input markets in Africa, they have been isolated due to a low land-to-labour ratio, sporadically interrupted by government interventions and emergency relief. All of these factors cause domestic transportation and marketing costs to rise, which is then passed onto farmers in the form of higher prices. Since farmers cannot afford to take on risky inputs at such high prices, effective demand remains low and commercial providers never enter the market. Without a vibrant private sector, prices continue to remain high and the stagnant cycle continues.

64. Furthermore, many of Africa's agricultural input policies lack implicit and explicit monitoring and evaluation impact mechanisms that would ensure that lessons learned from successes and failures of past policies are incorporated into future policies. Communities and individuals hardly ever associate with input policies that are designed and provided. There is also a lack of emphasis on improving policy effectiveness and efficiency, and inadequate attention to integration with complementary policies.

65. Although the high diversity of Africa's agro-ecological condition makes it possible for a wide range of agricultural production to take place in the continent, agricultural input policies have been disappointing over the three decades between the early 1970s and the turn of the new millennium in 2000 due to ineffective, inconsistent, uncoordinated and inappropriate policies.

Other reasons for the disappointing performance of Africa's agricultural input development policies include poor political and economic governance, inadequate funding for policy implementation, corruption, fragmented and overlapping agricultural institutions, lack of coordination between and within different levels of government, and poor access of farmers and other private investors to production credit.

66. Decades of inefficient policies and public interventions, coupled with unique agro-ecological conditions have resulted in an inefficient, and some would argue, non-existent commercial input market in much of rural Africa.

67. In most geographic regions and for most crops, agricultural inputs can increase yields and thus improve incomes. But consumption of agricultural inputs can be unprofitable if the farm gate prices are too high for farmers to afford or the risk level is unacceptable. In other words, if the price of inputs relative to outputs is not an incentive for farmers to use it, then there will be no effective demand. On the flip side, the price has to be set accordingly so that it is profitable for distributors to supply it but still be within the range that farmers can afford.

68. High transaction and marketing costs are common in Africa, and can eat into suppliers' profit margins; these high intermediate costs are then transferred to farmers in the form of high prices. For instance, in the case of irrigation, investment has been limited due to historically low economic rates of return. It is important to note that almost all large-scale irrigation projects in Africa are publicly funded.

69. In the 1970s and 1980s, these projects had very high costs per hectare (one project in Nigeria was estimated at \$27,000/ha in 2000 terms) and low or negative rates of return (African Development Bank, 2007). The high costs of providing this input included low market access for outputs and low productivity, stemming from low access to complementary inputs such as seeds and fertilizers (African Development Bank, 2007).

70. Broadly speaking, the constraints may be two-fold: those affecting a farmer's demand or desire to purchase the inputs and those affecting the trader's supply or incentive to provide agricultural inputs. Using the framework from Kelly, Adesina and Gordon (2003), the constraints can be generally grouped as knowledge constraints, financial constraints and risk constraints.

71. Figure 19 shows a detailed breakdown of the two categories along with questions that may help in addressing each type of constraint.

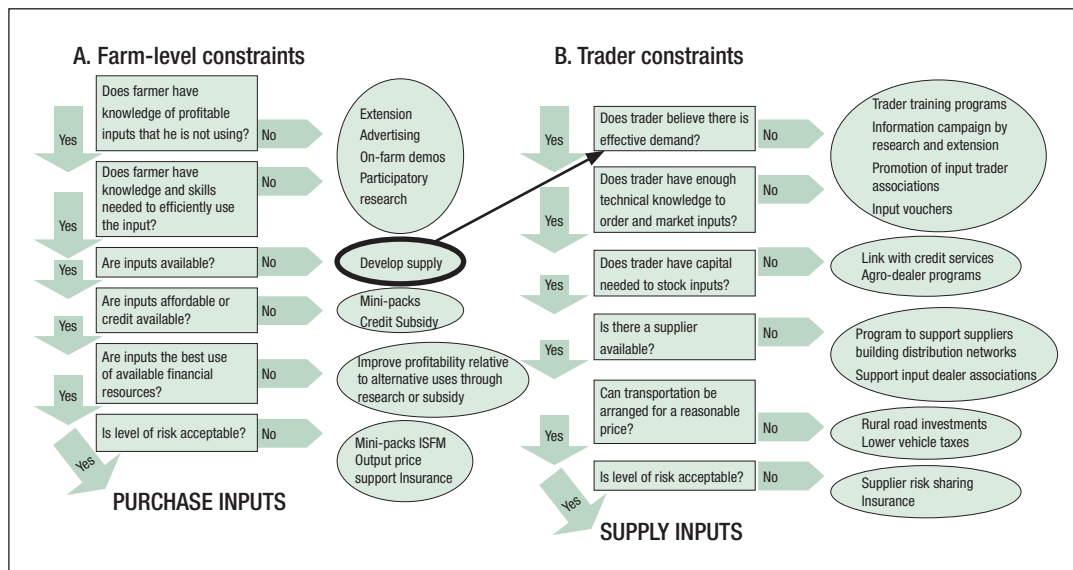
Demand side constraints

72. Farmers generally ask two questions about inputs before purchasing them: Will they be profitable? Can they acquire them and use them effectively? The constraints that may inhibit farmer demand for inputs generally involve knowledge, finances and risks.

73. Farmers need to be aware of the inputs, their benefits and how to appropriately use the technology. This may require extension services, marketing campaigns or farmer trials. In addition, farmers must be able to access the inputs and afford the inputs. Finally, farmers will weigh whether purchasing and using the inputs requires taking any unnecessary risk and if it is the best use of their available resources.

74. Yield risk is especially high in Africa due to the frequency of weather shocks and the volatility and uncertainty in producer prices (Morris et al., 2007). This can be further worsened by poorly timed influxes of foreign aid.

Figure 19: Identifying and reducing agricultural input constraints in Africa



Source: Kelly, Adesina and Gordon, 2003.

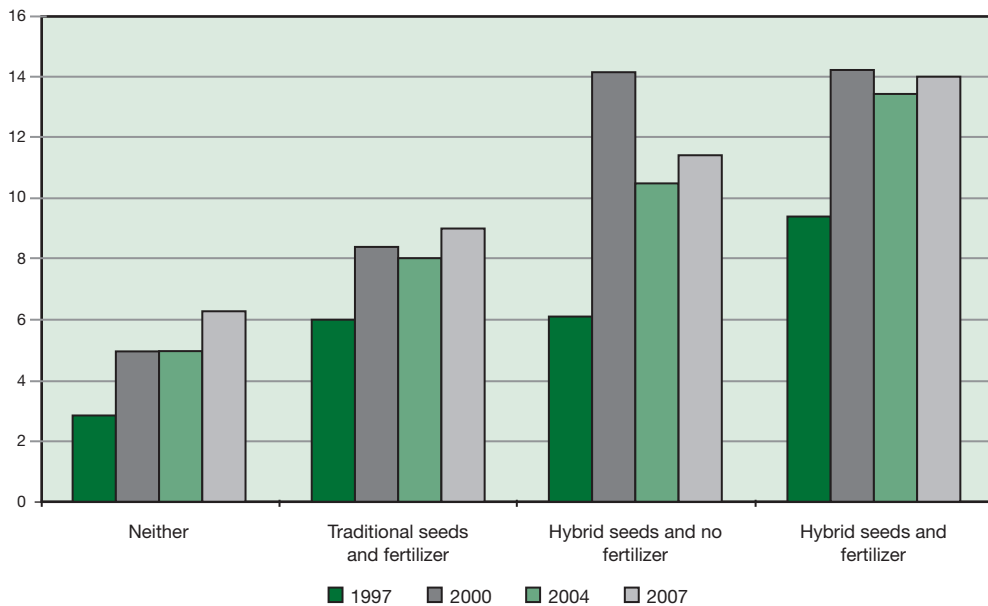
75. In the past, weak incentives had further constrained farmer demand. Initially it was thought that crops grown in Africa had a poor response to fertilizer due to soil fertility issues. In general, some crops respond better to fertilizer than others. Yanggen et al. (1998) found that crop responses to fertilizer were comparable to responses in Asia and Latin America when comparing regions with similar agro-ecological conditions. For instance, the response to fertilizer application is actually quite high for maize and rice in comparison to other cereals and is in part due to the fact that maize and rice are often produced in zones characterized by higher rainfall or under irrigation (Morris et al. 2007). This explains why maize is fertilized more often than any other staple (even though less than 40 per cent of total maize grown in Africa is actually fertilized) (Kherallah et al. 2002). Most cereals, however, do not generally respond well to fertilizer and generally have lower output prices, which makes the application of fertilizer to them unprofitable. Since evidence shows that farmers are more likely to apply fertilizer to crops that have a high value-to-cost ratio (Kherallah et al. 2002), they are unlikely to demand fertilizer for cereals other than rice and maize.

76. It is often profitable to apply fertilizer to cash crops, but not always in Africa (Morris et al. 2007). While there are many cash crops that are commonly fertilized, the share of total fertilizer applied to these crops in Africa is relatively small. In fact, total fertilizer applied to maize is higher than that applied to cash crops, but this is because maize is more widely grown. However,

it is important to note that farmers who grow and fertilize cash crops are more likely to use fertilizer on their food/staple crops, which may reflect familiarity with the input or better access to financial resources (Kherallah et al. 2002).

77. Demand for one input is interrelated with demand for other inputs. Figure 20 shows the benefits in terms of yields of utilizing a combination of both seeds and fertilizer compared to just one input at a time. When farmers used a combination of both hybrid seeds and fertilizer, their yields were higher than if they had used neither or just one of the inputs exclusively. It is unclear whether fertilizer consumption causes the adoption of hybrid seeds or vice versa, but in many countries use of the two inputs seems to grow in parallel to one another (Kherallah et al. 2002).

Figure 20: Maize Yields by Seed-Fertilizer Combination Group in Kenya, 1997-2007



Source: Ariga et al. 2009.

78. A similar pattern can be seen for irrigation. For example, in Madagascar, regions with a higher percentage of area under fertilized irrigated rice cultivation had much higher yields (3,200 kg/ha) than regions with lower levels of fertilization (1,966 kg/ha), despite both being irrigated (African Development Report, 2007).

Supply side constraints

79. The supply side constraints that prevent traders and the private sector from entering or developing input markets fall into the same categories as on the demand side. First of all, the trader must be able to perceive the effective demand and it must be high enough to prompt them to provide the input. In Africa, traders have long perceived low effective demand due to the isolation of farmers in rural areas and lack of a clear communication pathway between farmers, traders, and extension workers. In addition, the trader must have adequate access to credit or financial resources in order to maintain inventory and provide a reliable supply of inputs. In order to meet a price at which farmers can afford suppliers will weigh transportation and other transaction costs to determine if providing the input is even profitable. Suppliers will evaluate the level of risk involved in entering the market. For instance, does the government intervene periodically with free inputs that would disrupt their income? Frequent, yet inconsistent public interventions in the sector do provide poor farmers with adequate inputs temporarily, albeit at a substantial cost both fiscally and in terms of the overall market. These disruptions greatly reduce the reliability of input distribution by undermining incentives for private fertilizer dealers (Morris et al. 2007). Moreover, Africa has long had an unfavorable business climate, which makes private firms reluctant to invest in fertilizer marketing (Morris et al. 2007). Inhibiting factors include weak regulatory enforcement, high taxes and fees and widespread corruption.

Other constraints

80. Regarding the supply of different inputs, other major constraints faced by the private sector in Africa include:

- a. High costs: The input industry requires huge capital investments, especially in infrastructure and machinery for production and processing. Raising such capital is difficult, especially when credit facilities are inadequate and interest rates are high;
- b. High risks: The input industry is full of risks and uncertainties. Input supply is carried out under unpredictable conditions;
- c. Macroeconomic instability: Fluctuating exchange rates and high levels of inflation discourage investments in input production, processing, and marketing generally;
- d. Low demand for inputs: The demand for improved inputs is very low, due to inadequate promotion and marketing efforts, high prices, and inability of farmers to get timely supply in rural markets;
- e. Poor quality assurance and inspection: The input inspection system in Africa, which among other things looks after quality control, is almost non-operational primarily due to funding constraints;

- f. Delays in releasing improved varieties and technologies: Long delays in releasing improved inputs add to the cost of input production;
- g. Tedious and incoherent registration procedures that limit the input market to a few companies;
- h. Lack of information about effectiveness and use of inputs makes it difficult for the suppliers to forecast and plan their supplies accordingly;
- i. The unorganized input distribution system combined with a weak regulatory system;
- j. High cost of capital for input procurement and distribution;
- k. Low demand as a result of the weak purchasing power of farmers;
- l. Poor quality control mechanism;
- m. Irregular and inadequate supply and distribution inefficiency;
- n. Unstable policy environment, which has discouraged private investment in establishing distribution channels, capacity-building, and promotional activities;
- o. A weak legal and regulatory framework underpinning the liberalization of the agricultural input market, which has led to the supply of sub-standard inputs;
- p. Unstable macroeconomic environment (as reflected in variable interest rates, fluctuating foreign exchange costs, high and variable tariffs, etc), which has increased the risk of investing in input business development;
- q. Inadequate financial services, which have raised the cost of financing input procurement and distribution activities;
- r. Lack of market information about fertilizer prices, supply sources, availability, and overall market conditions;
- s. Poorly developed rural infrastructure, which has contributed to high transportation and delivery costs of inputs;
- t. Inadequate and (sometimes) obsolete port facilities, as well as an inefficient customs clearing bureaucracy, which has increased the landed cost of inputs;
- u. Organizational Constraints: Agricultural input business development is predominantly in the hands of a multitude of unorganized suppliers, scattered across the Africa. Lack

of organization, coupled with the dispersed nature of input distribution; hinder the supply of vital inputs to farmers; and

- v. Weak institutional framework for policy coordination and other technical constraints such as inadequate infrastructural facilities, dependence on unimproved inputs, inadequate extension services, inefficient inputs supply and distribution system and high environmental hazards.

3.2 Existing PPPs in agricultural inputs business development in Africa

3.2.1 Public-Private Partnerships in agri-input business in Africa: trends and lessons

81. Recent trends in Africa indicate several existing Public-Private Partnerships (PPPs) in agricultural input business development on the continent. Based on the identified existing PPPs in Africa, some general lessons and challenges are observed. In order to ensure competitive, sustainable and healthy agricultural input business in Africa, the input industry should be private-sector-driven in which the private sector stakeholders handle various components of agricultural input marketing continuum, namely: input raw material collection and delivery, processing/semi-processing, packaging, storage, transportation, and final sale/trade.

82. Within these partnerships, the specific roles and responsibilities of the public sector tend to include (a) support for rural infrastructure development; (b) research and development of appropriate technologies; (c) support for input supply and distribution, input industry development, input law enforcement and quality control; (d) maintenance of favorable tariff regime for agricultural inputs; (e) coordination of agricultural input data and information management systems; and (f) promotion and development of marketing institutions and appropriate micro-and credit institutions and other financial facilities for administering credit to the private sector.

83. Although many people now call for a complete removal of the public sector from input provision, the existing PPPs show that there is a crucial role for governments to play in this process by enabling and supporting commercial input development rather than directly intervening. Thus, for instance, while the Yara's Africa Partnership Programmes in Ghana, Malawi, Mozambique, and the United Republic of Tanzania support the agricultural input development by focusing on business development, the governments of these countries act as catalysts in providing supportive and complementary public goods. These public goods are in the form of investments in roads, irrigation, basic education, market information systems and

research and extension, as well as in improving institutions (contract law and enforcement, systems of quality grades and standards).

84. Recent trends in Africa indicate that some countries are returning to subsidies, especially since private sector entry into the market has been so unimpressive. Thus, for instance, in the 2005/2006 season, the government of Malawi began implementing the Agricultural Input Support Programme (ASIP) to improve smallholder productivity and reduce hunger and food insecurity. The programme consisted of allocating seed and fertilizer coupons to targeted households in areas with the potential to produce maize and tobacco. The coupons were redeemable for approximately 72 per cent of the costs of two 50 kilogram bags of fertilizer and for the full costs of two kilograms of hybrid seed or three kilograms of open-pollinated varieties (OPV). Since the coupons were redeemable for a relatively large amount of inputs, they were targeted at households that had the capacity to handle the amount of inputs. Therefore, the programme was not meant to reach the poorest. Coupons were redeemable at six private retailers and distribution was handled by large dealers who already had an established network and experience in working with the government. There were unsubstantiated reports (of diversion of coupons in some areas.

85. The programme resulted in a 30 per cent increase in maize output from the previous year. In addition, food prices were temporarily lower than they would have been without the subsidy. The increased output was immediately exported to Zimbabwe but halted after domestic maize prices skyrocketed several months later.

3.2.2 A sample of key public-private partnerships in agri-inputs business in Africa

86. Table 10 provides a summary of 15 major existing PPPs in the agricultural input sector with their names, countries covered, actors involved in partnerships, crops or inputs supported, amount of money involved where there is available information, and expected impacts or benefits from the partnerships and alliances. Public-Private Partnerships, defined broadly as any collaborative effort between the public and private sectors in which both sectors contribute to the planning, resources and activities to accomplish a mutual objective, are critical in developing a sustainable agricultural input business in Africa.

Table 10: Key existing Public-Private Partnerships (PPPs) in the agricultural input sector in Africa

Name	Countries covered	Actors in partnerships (public/private, NGOs, donors, etc)	Crops or inputs supported	Amount of money involved	Expected impact or benefits
Stanbic Bank Uganda, AGRA and Kilimo Trust Partnership	Uganda	Public and private actors	The entire value chain of different food crops: maize, sunflower, barley, rice, sorghum, beans and soybeans. Inputs include fertilizers and seeds.	AGRA and Kilimo Trust are providing a \$2.5 million loan guarantee fund and technical support, while Stanbic Bank will lend \$25 million over five years. 40% of this amount will cater for agri-businesses in the value chain.	To finance Uganda's farmers and small/medium businesses and strengthen their access to inputs.
AGRA's Innovative Financing Initiative agreements with commercial banks	Kenya and Tanzania	Public and private actors	General agricultural development	Plans to mobilize US\$4 billion in affordable credit	To support agricultural development
AGRA, Standard Bank and other partners	Uganda, Ghana, Mozambique and Tanzania	Public and private actors	Different types of crops and inputs	US\$100 million worth of affordable finance, leveraged through credit guarantees	To finance farmers and agricultural businesses as part of regional partnerships
Equity Bank and Amiran Kenya Limited Partnership	Kenya	Private actors	Inputs such as drip irrigation, farmer's green houses, quality seeds, fertilizers, agro-chemicals and tailored training from Amiran's team of expert agronomists	Credit ranging from KSh\$40, 000 to KSh\$100, 000 depending on the specific requirements of the farmer.	To enhance small scale farmers access to credit from Equity Bank to finance modern agricultural inputs provided by Amiran Kenya

Name	Countries covered	Actors in partnerships (public/private, NGOs, donors, etc)	Crops or inputs supported	Amount of money involved	Expected impact or benefits
The Ministry of Food and Agriculture and the Environmental Protection Agency of Ghana in collaboration with AGRA and IFDC	Ghana	Public and NGO actors	Inputs such as seeds and fertilizers and training of approximately 2,200 agro-dealers and seed producers in business management skills	Unknown	This is a three-year initiative established to rapidly increase farm productivity and incomes for 850,000 smallholder Ghanaian farmers by increasing access and affordability of quality seeds and fertilizers
IFDC in collaboration with National Agency for Food, Drug Administration and Control (NAFDAC) of Nigeria, Crop life Nigeria, AGRA, Fidelity Bank of Nigeria and National Food Reserve Agency of Nigeria	Nigeria	Public, private and NGO actors	Inputs such as fertilizers and agro-dealer certification training on crop protection products	US\$5.5 million	To train more than 10,000 agro-dealers in Nigeria on agro-chemical safety over a three year period
The Tanzania Agricultural Partnership (TAP) between YARA and the Government of Tanzania	Tanzania	Public and private actors	Agricultural inputs like seeds and fertilizers	US\$2.7 million	Established in 2006 to reduce poverty by improving the use of agricultural inputs like seeds and fertilizers throughout the value chain (import of farm inputs like seeds and fertilizers)
The YARA-led Ghana Grain Partnership (GGP), which now encompasses 10 public and private organizations	Ghana	Public and private actors	Farm inputs such as high-yield seeds, chemicals and fertilizers	US\$2.25 million with YARA contributing US\$1 million and Africa Enterprise Challenge Fund (AECF) contributing the remaining US\$1.25 million	To strengthen the Ghanaian grain market by improving collaboration throughout the maize value chain (market infrastructure development)

Name	Countries covered	Actors in partnerships (public/private, NGOs, donors, etc)	Crops or inputs supported	Amount of money involved	Expected impact or benefits
The YARA-led Malawi Agricultural Partnership (MAP), which now involves partners like AGRA, IFAD, the Norwegian government and local authorities such as the African Institute of Corporate Citizenship (AICC)	Malawi	Public, private, donors and NGO actors	Fertilizers and the entire value chain	Unknown	To reduce costs along the fertilizer supply chain in order to build on the success of Malawi's fertilizer subsidy programme, and engage the entire value chain in a coordinated programme of initiatives related to agricultural development
The YARA-led Agricultural Growth Corridor	Tanzania and Mozambique	Public and private actors	Fertilizers and improved inputs efficiencies and infrastructure management	Unknown	The development of port facilities in Beira, Mozambique and Dar es Salaam, Tanzania as regional distribution hubs for agricultural inputs as a catalyst for wider agricultural sector growth across various interconnected agricultural value chains
The Yara Prize for a Green Revolution in Africa	Africa	Public and private actors	The entire food system with a focus on agricultural inputs such as fertilizers and seeds	US\$ 100,000 grant, a glass trophy and a diploma. Winners are chosen by The Yara Prize Committee.	Launched in 2005, the Yara Prize honors work that increases food productivity, security or availability through improvements in food systems, advancements in sustainable agriculture and development of local markets. The prize aims to encourage innovation and entrepreneurship.
National Microfinance Bank, Tanzania and the Government of Tanzania	Tanzania	Public and private actors	Products such as Sugar out growers and ware house	Unknown	Development of new products related to the various stages of the agricultural supply chain to meet the needs of the industry

Name	Countries covered	Actors in partnerships (public/private, NGOs, donors, etc)	Crops or inputs supported	Amount of money involved	Expected impact or benefits
The West African Seed Alliance (WASA) involving MONSANTO, AGRA, USAID, PIONEER (A DUPONT COMPANY) and five West African Governments	Five West African countries	Public and private actors and donors	Affordable, timely, and reliable access to high-quality seeds and planting materials	US\$61 million alliance with USAID contributing US\$14.3 million over a five-year period	To ensure growth and development of viable agricultural inputs systems in West Africa, and build the capacity of existing and emerging seed companies while expanding agrodealer networks. WASA also addresses seed trade harmonization laws across the five countries it works in, facilitating cross-border trade.
The African Agricultural Capital (AAC), established by the Rockefeller Foundation, the Gatsby Charitable Foundation and Volksvermogen NV as a venture capital investment fund	East Africa	Public and private actors and donors	Businesses within the agriculture value chain with a particular focus either on inputs and service provision to farmers or on providing farmers with improved access to market opportunities	Largely unknown	To invest in small and medium-sized agriculture-related businesses and improve the livelihoods of small-holder farmers in East Africa
Africa Seed Investment Fund (ASIF), managed by the African Agricultural Capital (AAC)	Eight countries in Eastern and Southern Africa (Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda and Zambia)	Public and private actors and donors	Seeds or vegetatively propagated products for delivery to markets	Largely unknown	To improve the delivery of quality certified seed to smallholder farmers and build healthy, long-term viable businesses that can attract additional capital to the seed sector

Source: Summary from the literature review

IV. Prospective and Potential Successful Alliances and Partnerships in Agricultural Input Business in Africa

4.1 Potential for alliances and partnerships in agricultural input business in Africa

87. The three main constraints facing agricultural input business sector in Africa include knowledge constraints, financial constraints and risks. These are faced by both purchasers and suppliers. Successful prospective and potential business alliances to address these constraints should focus on a combination of the three at the same time. For example, in 1990, the Sustainable Community-Oriented Development Programme (SCODP) aimed to increase input use among poor farmers in Western Kenya by increasing farmers' awareness of modern inputs through a network that practiced participatory input testing and blending. An unintentional consequence of the programme was that traders learned that there was effective demand for inputs such as fertilizer and began stocking them (Kelly et al. 2003). As a result of the programme, an estimated 50,000 farmers began using fertilizer. The success of the programme was not just in its ability to increase farmers' knowledge of the inputs, but also the traders' knowledge of local demand. In addition, it also addressed the affordability constraint by marketing cheaper mini-packs of inputs, and the availability constraint by establishing SCODP shops and stimulating traders to stock the inputs.⁸

88. Prospective partnerships and alliances should bring together resources and expertise from a wide variety of actors, including the private sector, international organizations, government agencies from developing and industrialized countries, multilateral and bilateral donors, philanthropic foundations and non-governmental organizations, and some of the largest agricultural input and agro-industry companies in the sector.

89. Another key supportive role for the government to play in the process involves changes that will reduce marketing costs. Marketing costs of agricultural inputs are high in African countries and constitute at least 50 per cent of the farm gate price. High input costs can be reduced by investments that lower the costs of transportation and marketing, which will not only make prices lower for farmers but will also increase the profitability for suppliers. Several ways to do so include reducing port fees, coordinating the timing of input clearance from the port with up country transport, reducing transport costs and reducing high fuel taxes.

⁸ The study notes that the SCODP programme did run into some problems despite its success. Because the programme was subsidized, the costs of inputs it provided were 16 per cent lower than private trader input prices. Since the private traders have cash constraints, it is doubtful that they can keep their inventory stocked. However, the Farm Input Promotion Service (FIPS) is addressing trader cash constraints through distributor credit. See Kelly et al. 2003 for more details.

90. In some regions where governments are still heavily involved in agricultural input marketing, they can be encouraged to do so in a way that still fosters commercial competition. In a number of countries in West Africa, the governments control fertilizer distribution but introduce some competition by contracting private importers and distributors to actually supply the fertilizer. In Benin, a farmer-owned organization selects suppliers and negotiates prices, and also serves as a clearing house to ensure farmer repayment of government-provided input credit. These examples of private-public cooperation can serve as models for strengthening competition in markets during the transitional period.

91. Since each country's demand for agricultural inputs is relatively low, regional markets should be exploited in order to achieve economies of scale and lower marketing costs. Governments can reduce regulations that restrict regional input trade and can focus on policies that harmonize standards across countries. As of 2003, East and Southern Africa had made progress on harmonizing variety release procedures for seeds across countries so that breeders could market their products to similar agro-ecological climates that happen to cross national borders (Rohrbach, Minde and Howard 2003). West Africa had also made some progress towards standardizing and simplifying phyto-sanitary procedures and regulations for cross-border seed trading. By allowing suppliers to pursue multi-country variety releases, they can capture economies of scale and lower prices more easily. Governments can also reduce barriers to regional trade of agricultural output, such as maize. This would prevent declining maize prices in the face of increased output and increase effective demand for fertilizer (Kherallah et al. 2002).

92. Aside from complementary investments to reduce risk indirectly, there are also innovative programmes that can address these constraints more directly. Seed and fertilizer distribution programmes have had much success in the use of small, more affordable packages often referred to as mini-packs. These smaller packages allow farmers to experiment with new technologies without making a major financial commitment. This increases their knowledge of available yield-improving inputs, and allows them to find a combination that works specifically for their situation. In addition, these mini-packs can increase demand, and convey this information to suppliers as farmers tend to move to slightly larger sizes over time (Kelly et al. 2003). Even in this case, governments can play an important role by ensuring that policies are passed or amended to allow for the sale of different sizes of input packages. For example, Kenya had to repeal a law that prohibited 50 kilogramme bags of fertilizer from being broken into smaller units. As a result, 46 per cent of Kenya's smallholders now using fertilizer purchase it in packages that are 10 kg or less (Kelly et al. 2003).

“Smart” subsidies

93. The earlier section on the pre-reform period pointed out that heavy reliance on input subsidies is expensive and inefficient. They also often crowd out potential private investors who may be able to ensure that a wider variety of inputs are more consistent in terms of availability at lower prices (given that certain supporting services are also provided by the government). However,

recent trends in Africa indicate that some countries are returning to subsidies, especially since private sector entry into the market has been so unimpressive. Advocates for these new subsidies insist that they are more effective on equity grounds and can be “market smart” if implemented correctly. To be “smart”, these subsidies must (a) achieve at least the same level of benefits as or higher (in terms of agricultural productivity and food security) than what could have been achieved by investing those same resources in other areas within the sector; and (b) encourage farmers’ purchase of inputs on commercial terms, or at least not impede it (Minde et al. 2008).

94. Minde et al. (2008) review the benefits and costs of recent input subsidies in Malawi. The main cost factors included in their evaluation are the cost of acquiring the fertilizer and the full economic cost of implementing the programme, which includes the opportunity cost of using the resources for a different sector strategy or component. These are assessed against the benefits, which consider the price of the output, the agronomic response rates and the availability and utilization of the fertilizer by farmers. The degree to which subsidized fertilizer adds to total fertilizer use is also considered in order to assess the degree to which subsidized fertilizer crowds out commercial sales.

95. In the 2005/06 season, the government of Malawi began implementing ASIP to improve smallholder productivity and reduce hunger and food insecurity. The programme consisted of allocating seed and fertilizer coupons to targeted households in areas with the potential to produce maize and tobacco. The coupons were redeemable for approximately 72 per cent of the cost of two 50 kilogram bags of fertilizer and for the full cost of two kilograms of hybrid seed or 3 kilograms of OPV. Since the coupons were redeemable for a relatively large amount of inputs, they were targeted at households that had the capacity to handle the amount of inputs. Therefore, the programme was not meant to reach the poorest. Coupons were redeemable at six private retailers and distribution was handled by large dealers who already had an established network and experience in working with the government. There was substantial report (but not proven) of diversion of coupons in some areas.

96. The programme resulted in a 30 per cent increase in maize output from the previous year.⁹ In addition, food prices were temporarily lower than they would have been without the subsidy. The increased output was immediately exported to Zimbabwe but halted after domestic maize prices skyrocketed several months later.

97. Overall, the benefit-to-cost ratio was estimated at 0.76 to 1.36 (Dorward et al. 2008). Yet the costs of the programme (approximately \$80 million) did divert resources from other agricultural programmes, as evidenced by declining budget shares for research and extension. Minde et al. (2008) carefully point out that there were a number of areas in which the programme could have been improved. By targeting the subsidized inputs to the poorest farmers, the diversion from commercial sales would have been lessened and overall maize output would have improved by a greater amount. In addition, since the programme worked with so few retailers, many smaller

⁹ This was later reported to have been substantially overestimated and partly due to favourable weather conditions (Minde et al. 2008).

rural retailers were essentially put out of business by the competition. Including them in the process would have ensured less disruption in the commercial market and greater equity in distributing the programme's benefits.

98. This programme shows that although efforts can be made to improve subsidies, there are a great number of factors that must be considered to ensure that they are truly "smart". Morris et al. (2007) provide ten guiding principles for subsidies:

- a. Promote the factor or product as part of a wider strategy that includes complementary inputs and strengthening of markets;
- b. Favour market-based solutions that do not undermine incentives for private investment;
- c. Promote competition and cost reducing barriers to entry;
- d. Recognize that effective demand from farmers is critical to long-run sustainability;
- e. Insist on economic efficiency as the basis for fertilizer promotion efforts;
- f. Empower farmers to make the decisions about soil fertility management;
- g. Devise an exit strategy to limit the time period of public interventions;
- h. Pursue regional integration in order to benefit from the economies of market size;
- i. Emphasize sustainability as a goal when designing interventions; and
- j. Promote pro-poor growth, in recognition of the importance of equity considerations.

99. The successful implementation of public-private partnership in agricultural input business development in Africa should be contingent upon the introduction of appropriate macroeconomic policies by the public sector that provide the enabling environment to stimulate greater private sector investment in input business.

4.2 Attractiveness of agricultural input business to private investors

100. Private investors are always willing to put their money in attractive enterprises. The relative attractiveness of input production and supply enterprises to private investors differ from one country to another. The relative attractiveness of the different input enterprises is indicative

of the comparative advantage available in each country based on different agro-ecological conditions. A thorough literature review reveals that the main reasons for the attractiveness of input production and supply enterprises to private investors are high level of demand of inputs, availability of raw materials/inputs, high rate of returns on investment, and lack of competing local investors. All of these indicate the economic viability of input enterprises. Efforts invested in removing the identified constraints to investment in agricultural inputs will go a long way in stimulating the flow of investment into the sector.

101. Huge capital requirement is a disincentive for domestic private investors to invest in input production and supply enterprises. The general inference is that agricultural input enterprises in Africa are fairly more attractive to foreign private investors than domestic private investors. Foreign private investors tend to be attracted to input enterprises that are capital-intensive. Activities that are infrastructure-related are not highly favoured by private investors as they are seen as belonging to government domain (*i.e.* public goods).

102. Many private investors tend to invest significantly in input enterprises if they see high potential for markets and returns on their investments. Based on the Asian experience, social capital formation is a very powerful stimulus that attracts private investors into input business. This requires institutions and training in Africa. Social capital can emerge spontaneously in Africa if complementary policies, standards and regulations are in place. Different approaches aimed at creating a market system for inputs should include a wide range of private investors to increase agricultural input expansion and growth.

103. During the implementation of the Structural Adjustment Programmes (SAPs), the government withdrew from procurement, supply, and distribution under a deregulation scheme, where market forces largely determined prices. Subsidies on agricultural inputs stopped. The private sector responded very weakly and could not meet the short-term challenge. This is because the government intervention in input and output marketing resulted in inefficient private sector marketing to provide inputs at a lower cost (Shepherd, 1989; Donovan, 1996; FAO, 1994; Gordon, 2000; Bumb and Baanante, 1996). Because the private sector deemed agricultural input supply as unprofitable, non-governmental organizations (NGOs) and decentralized units of local government took up the responsibility of input supply with fundamental flaws in terms of high costs and inadequate coordination (Kelly et al., 2003; White and Eicher, 1999).

104. Private companies have yet to enter the input market in the numbers expected after the withdrawal of the State because of lack of an enabling environment and supporting infrastructure to raise the profitability of the use and marketing of agricultural inputs by the private sector. In some situations where input marketing could be profitable, the private sector is not developing input markets because of the effects of public policies on the flow of credit and investment funds, taxes, tariffs, subsidies and budgetary allocation. In addition, the impact on relative prices has not been as positive as expected. From the early 1980s to the mid-1990s, the fertilizer-to-crop price ratio increased in seven out of 10 countries, and fell in three – Ethiopia, Kenya and Zimbabwe (Kherallah et al. 2002).

105. Private-sector participation in the marketing of agricultural inputs has been severely discouraged not only because of the inconsistent implementation of many government policies but also the lack of an expanded role for the private sector in agribusiness activities generally. The perception of the private sector is not so much on input subsidies but rather the management of subsidies by public agencies, which seems to be discouraging the growth of a competitive private market and undermining incentives for private distributors to invest in input distribution. A precondition put forward by the private sector for the sustainable development of agricultural input business in Africa is the establishment of a conducive policy environment and supporting institutional changes that will shift the role of government from that of an operator to that of an enabler.

106. As a result of Africa's weak market infrastructure, input markets are often localized with weak transmission of prices between the markets and hence sharp fluctuations in prices. One often finds acute input shortages in one subregion while there is surplus elsewhere, within the country or region. One response to addressing such marketing problems has been the introduction of Market Information Systems, which are now operational in many African countries. However, they still continue to suffer from lack of knowledge about them, inconsistency in the information provided and the general low access by some members of the private sector who lack the necessary network connectivity to them.

4.3 Investment options, key financing and funding opportunities for the private sector in agricultural input business development

107. The challenge facing agricultural input business development in Africa is generating private sector competitiveness through accelerated commercialization and investment. The approach is to depend on market-oriented and private sector driven initiatives that rely primarily on the private sector to create wealth and unleash economic growth by securing a niche in the globalized world. Agricultural input business needs to be profitable for the private sector. Once the private sector realizes the benefits of investing in the input business, there will be an interest in developing it. Despite the numerous constraints that the private sector faces in agricultural input business, there is ample evidence that the business could be highly lucrative and profitable. Participation in input business has the potential of being financially attractive to the private sector if adequate funding and cost-recovery mechanisms are in place. Increasing profitability of input business will require investments in the entire commodity chain—from production through processing and storage to marketing—in order to add value and produce the quality the market demands.

108. Two broad categories of investment in agricultural input are available. They are the domestic and foreign sources. The local sources include public and private investment while the foreign sources include multilateral, bilateral and private investment. The capital from various sources

creates investment that, in turn, creates increasing commercialization and generates increasing returns of various kinds as driven by the pattern of demands. There is less data on domestic private investments than on foreign investment. Under normal circumstances, there should be complementarities between both public investment and private investment in developing agricultural input market. This assumption is based on the premise that public investment will focus on supporting facilities such as infrastructure, utilities, research and development, social and human capital. However, the reality is that in many African countries, public investment has focused largely on commercial ventures in a competitive manner rather than complementary to private-sector commercial initiatives. Not only has this rendered public sector investment a disincentive to private sector investment, it has also led to input market inefficiency and a hostile environment for foreign investments.

109. Because of the generally unfavourable private investment climate in Africa, both domestic and foreign investment flows have been on a downward trend. The fluctuating movements in both domestic and foreign investments have been highly correlated with the changing states of political, economic and policy instability, discontinuity and inconsistency on the continent. The ongoing democratization in many African countries should normally have been expected to generate more confidence in the continent's economy and enhance the investment climate. However, recent global economic crisis has dented investment in input supply system in Africa.

110. Local and international banking institutions, non-bank financial institutions, and local producer organizations are available to assist in increasing financing for the production, processing, and trade of agricultural inputs through the use of credit facilities, where appropriate, to reduce risk. The opportunities for the private sector to be both a source of investments in input business and a contribution to an environment where all investments yield higher returns reside in investment in their capacities and execution and monitoring of public regulations in public-private partnerships. The private sector in Africa is very large and diverse and can be a major source of standard setting, training and input business financing. The private sector can also serve as Medium and Small-Scale Enterprises (MSMEs) and service providers to enhance the efficiency of agricultural input marketing and deal effectively with the costs and risks of developing the market.

V. Conclusions, Policy Recommendations and Strategies

5.1 Concluding remarks

111. Although agricultural inputs have great potential to increase productivity in certain contexts and for certain crops in Africa, adoption remains relatively low in most cases. This is the outcome of a shifting policy environment over the past forty years that has led to an underdeveloped commercial market for inputs. This report has shown in more detail that the constraints preventing a successful agricultural input market in Africa occur on both the demand and supply sides and are unique to the African context. For one, the general isolation of rural farmers from markets makes marketing costs prohibitively high for most suppliers. In addition, perceived demand for inputs is low, despite the contrary. Key policies and support programmes to overcome these constraints were also discussed. It was concluded that direct interventions of governments in providing inputs can be more disruptive than supportive, and in almost all cases the resources used can be better spent elsewhere. Ensuring that complementary public goods – transportation infrastructure, communication, research and extension, irrigation – are provided can foster a more successful commercial market for inputs. The private sector is more capable of providing inputs to farmers at lower prices and in reliable quantities, but only if the supply side constraints are also overcome.

112. Fertilizers and improved seeds are good examples of inputs that the private sector can supply, as shown in Asia's Green revolution, but their use is not widely profitable in Africa today. This is not so much because of the absence of subsidies but because of poor infrastructure and delivery systems, lack of farm credit, and weak marketing institutions for selling final products. This is the outcome of government and donor failure to make adequate investments in basic infrastructure in rural areas, and the virtual collapse of marketing, credit and input supply systems for small farms since the structural adjustment programmes of the 1980s and early 1990s. The private sector was supposed to step in and fill the gap left by the demise of state institutions, but apart from commercial farms and farmers linked to high value market chains, most of Africa's small farmers have been left out in the cold. While the rest of the world has been busy investing in its rural areas and agriculture, and increasing its competitiveness, Africa has been standing still. The average yield of cereals and many traditional export crops (e.g. coffee and cocoa) has barely increased in Africa in recent decades; while there have been very sizeable increases elsewhere. As a result, the total value of Africa's agricultural exports has almost doubled since the 1960s while the total value of world agricultural trade has increased tenfold (Africa's market share declined from about 7.5 per cent to just over 2 per cent).

113. The return to smart subsidies is worrisome. Although there are situations in which subsidies may be the most effective strategy (for example, in the immediate aftermath of an emergency), they are often difficult to phase out and present opportunities for capture and rent-seeking. In

addition, they discourage private investment in the sector. However, guidelines for avoiding the disadvantages of input subsidies are available for governments that wish to pursue a subsidy policy. The remainder of this chapter provides concrete strategies for accelerated investment in, and a conducive environment for Africa's agricultural input business development.

5.2 Strategies for accelerated investment in Africa's agricultural input business development

114. Past efforts and policies to develop agricultural input business in Africa seem to have suffered because of lack of understanding of the goals, planning and implementation of such policies, which in the final analysis tend to determine their success or failure. Dramatic increases in knowledge about specific agricultural input business development strategies are needed if their effects are to be successful.

115. The strategies for accelerated investment in Africa's agricultural input business development should directly address issues related to the harmonization of agricultural input policies, access to crucial agricultural inputs such as fertilizer, seeds and irrigation, and clear description of functions and responsibilities of the various actors in the agricultural input business.

116. It is also important to monitor policy incentives and disincentives by ascertaining the extent of price interventions as agricultural inputs are passed up the agricultural supply chain from the producers and suppliers to the consumers. This measure will typically allow one to track policy interventions in terms of prices received by producers, suppliers and others in the long chain involving transportation, processing, wholesaling, retailing and selling of agricultural inputs. Price gaps in input and output markets as well as foreign exchange markets also need to be monitored in order to differentiate between direct policy interventions by governments such as subsidies and tariffs to create a safe and predictable environment for private investors and the prevailing business operations and prices without policy interventions by governments. It is important to monitor institutional laws and regulations, control, inspection and approval mechanisms introduced by governments to promote agricultural input business development in Africa.

117. Successful development of Africa's agricultural input sector will require implementation of a strategy that embraces the modernization of the sector and enhances the private sector's capacity and incentives to engage where it can perform. African governments need to work with international private companies and domestic private investors, along with local and international NGOs, foundations, national and regional agricultural research organizations to scale up and expand public-private alliances in input business. Both the public and private sectors also need to develop alliances that mobilize the capacities and resources of universities and think-tanks to support advanced training for African scientists, policy makers, and business leaders.

118. Increasing regional trade in agricultural inputs is important in order to improve the operation of key trade and transport corridors, improve market structures, expand financial services, and facilitate the free flow of inputs from surplus to deficit areas. Long distances and poor roads, combined with man-made impediments such as export restrictions, cumbersome customs procedures, and unpredictable government marketing operations need to be dismantled. It is crucial to link farmers with improved private sector distribution, processing and storage. Establishing multi-partner value chain alliances, supporting agricultural input value chain development and increasing access of the private sector to capital, including expanding credit availability and reducing the risks to commercial banks for lending will increase profitability of key agricultural input value chains.

5.3 Strategies for a conducive environment for agricultural input business development in Africa

119. As a means of enhancing policy credibility and accelerating input trade to overcome the economic disadvantages of fragmentation of many small-nation economies in Africa, a policy environment that is free of distortions and promotes competition is critical to the ability of the private sector to enter input markets. It is also essential to create an enabling environment that encourages private sector trade associations to invest in input production, processing, and marketing. Linkages among producers, traders, processors, and consumers will reduce vulnerability and encourage markets to respond to shocks.

120. On governance, there are six dimensions of governance that have gained global recognition and they should be applied to input business in Africa. These dimensions of governance include voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. Donor harmonization is also important and this should be in form of the number (or proportion) of donors adopting common mechanisms and procedures for channeling resources into the input sector.

121. Bridging information gaps and strengthening agricultural input market exchanges are crucial in capturing trade information for major inputs in Africa. Improving agricultural input marketing, will lead to the dissemination of critical market information such as prices, regional input statistics, supply and demand figures and the regulations and procedures that govern trade in different countries. This will ensure a continuous flow of information on topical and emerging issues in input trade and will ensure the availability of reliable and timely market information that will help private investors make informed choices and understand the peculiarities of the agricultural markets in the region.

122. The organized private sector need to be mobilized, encouraged and given incentives to actively participate in the production and distribution of agricultural inputs through the provision of *credit and micro-credit* strategies. Integration and linkage of rural financial institutions to the

formal banking sector and regulation of the growth of non-bank financial institutions with emphasis on savings mobilization at the grassroots level will go a long way to reduce transaction costs. Modification of terms of credit such as interest rate, eligibility criteria and legal requirement to enhance market access is pre-requisite for resource mobilization. Responsible promotion of group action in form of cooperative activities should be encouraged in order to take advantage of group dynamics, with its concomitant mutual guarantee, as a strategy for agricultural input development. Services which cooperatives can render include the administration of government incentives to input supply and marketing, credit delivery and retrieval.

123. The range of macroeconomic and institutional policies and the legal framework that affect investment in agricultural input development should broadly cover fiscal, monetary and trade measures that provide the enabling environment for foreign and domestic private investment and promote economic growth. Fiscal policies introduced by the public sector should focus on budgetary, tax and debt management policy instruments, which will, in turn, influence the climate for the flow of investment, especially foreign private investment. The public sector should implement a favourable corporate tax policy regime to enhance after-tax profits and its capacity to finance public investment. The level and quality of public investment in agricultural input development will directly affect the flow of both foreign and domestic private investment in the sector.

5.4 Strategies for mitigating risks and negative impacts involved in agricultural input development in Africa

124. If both the public and private sectors in Africa are interested in mitigating risks and negative impacts involved in agricultural input development in Africa, then they should not only focus on addressing constraints identified in chapter 4 but also concentrate on the cost-benefit analysis of such agricultural inputs to justify their development. Although the agricultural input business has a potential to lead to wealth creation for private investors and increased food security for input consumers, this does not mean that they should invest more in them without consolidating the technical improvement of input suppliers and consumers where necessary. An effort towards developing the agricultural input business in Africa should go hand in hand with increasing access of the private sector to good infrastructure and delivery systems, reliable credit facilities, and strong marketing institutions.

125. When considering agricultural input development in Africa, technical problems relating to unreliability and undurability of agricultural inputs procured, failure in delivery system, and the weak linkage between input suppliers and consumers should be addressed. The private sector should conduct greater baseline in-depth understanding of how agricultural input development in Africa can be socially, culturally, economically and environmentally sustainable.

126. Hitherto, the whole idea of agricultural input development in Africa has been centred on public sector-dominated development strategy (*i.e.*, a top-down approach). It is important that the private sector lead and drive agricultural input development in Africa so as to feel they own the process of agricultural input development to a significant extent. Inadequate dissemination of market information (or providing it in an inaccessible style) must be tackled for future development of agricultural input business in Africa. Improved governance, equitable and well-functioning markets are likely to make the private sector flourish through decent incomes from supplies of essential inputs such as seeds and fertilizer. By concurrently improving rural infrastructure, African governments would create favourable conditions for level playing fields and increasing market access for agricultural inputs. Consequently, farmers would be encouraged to adopt new and sustainable agricultural inputs and diversify agricultural production into higher-value crops in order to raise incomes, increase food availability, contribute to asset diversity growth and subsequently break out of the poverty-hunger-malnutrition trap.

127. The organizational setting of distribution and supplies of agricultural inputs from the point of production to the point of consumption in Africa tends to be quite complex due to the reliance on endless incompetent specialized departments and offices that thrive on proliferation of roles and responsibilities, which limits the degree of institutional coordination and breed institutional conflicts. Overlapping organizational roles and responsibilities need to be carefully prevented for future input development to be profitable. There is also need for proper synchronization between the public and private sectors in Africa in developing agricultural input business in terms of operational modalities.

5.5 Strategies to strengthen the private sector capacity in agricultural input business development

128. To ensure the sustainability of agricultural input development in Africa, it is important to enrich the understanding of the private sector about the technological know-how of agricultural inputs. Future planning and implementation arrangements for agricultural input development in Africa need to be organized such that appropriate institutional and in-service training programmes are designed to equip people for their jobs; these include extension agents who can link both input suppliers and consumers without any socio-political interference.

129. In order to minimize the unsustainable fiscal burdens placed on African governments in input supply through input subsidies, public-private partnerships are encouraged in such a way to avoid disruption of the private input market. This will require capacity-building of the private sector in basic characteristics of the agricultural input network, such as their level of integration with other suppliers, the level of prevailing competition, different marketing practices in the input supply sector, information and communication technologies (ICTs) that can lead to increase in the value and volume of available of commercial inputs.

130. Building the capacities of the existing agricultural market exchanges and encouraging the establishment of exchanges in countries where they do not exist will strengthen information flow and create wider market networks in Africa. This will also lead to strong supportive frameworks that enhance competitiveness in the agricultural input trade. If African countries want to achieve potential gains of agricultural input business, emphasis should be in areas where they have comparative advantages to ensure efficiency of resource use. Further reforms in input supply should be adapted to each country's specific economic and social characteristics, priorities, and level of development.

131. Multiple, duplicative and overlapping protocols, structures and mandates of institutions involved in regional trade arrangements should be dismantled to expeditiously clear and facilitate the movement of inputs across national borders, and building the capacity of trade associations to identify and advocate for needed improvements along the trade and transport corridors. The capacities of government agencies, regional bodies, private sector trade associations, farmer organizations, and other development partners should be strengthened in order to identify and address the main bottlenecks to the marketing of agricultural inputs.

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