

Can Agro-Dealers Deliver the Green Revolution in Kenya?

Hannington Odame and Elijah Muange
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The Political Economy of Cereal Seed Systems in Africa

Preface

This *FAC Working Paper* is part of the first phase of a collaborative research project of the Science, Technology and Innovation (STI) Theme of the Future Agricultures Consortium (FAC). It was funded through a grant from the UK Department for International Development (DFID). The project explored the political economy of cereal seed systems across five distinct country contexts – Ethiopia, Kenya, Malawi, Ghana and Zimbabwe – during 2009-10. The evolution of seed research and development programmes and processes has varied greatly across these countries. In each case, a unique set of public and private actors and interests has been involved in defining priorities in seed policy and implementing projects, each seeking to influence those agendas to their advantage. Moreover, each country has a different reliance on ‘modern’ hybrid (or sometimes biotech) varieties and associated R&D and supply systems and an independent informal sector, involving networks of farmer experimenters and seed bulkers and suppliers, with varying degrees of capacity.

As calls for a ‘Uniquely African Green Revolution’ gain momentum, the focus on seeds and seed systems is rising up the agricultural policy agenda. Much of the debate stresses the technological or market dimensions, with substantial investments being made in seed improvement and the development of both public and private sector delivery systems. But there is currently much less emphasis on the wider policy dimensions – and particularly the political economy of policymaking in these diverse agricultural contexts.

Experience tells us it is these factors that often make or break even the best designed and most well intentioned intervention. And since investment in seed improvement and supply was last emphasised as a major priority in agriculture (in the 1970s and 80s), contexts have changed dramatically. The collapse of national public sector breeding systems has been dramatic, and this has only partially been compensated for by the selective entry of the private sector. Large multinational seed and agricultural supply companies are increasingly dominating the global scene, and there are many claims made about the promises of new technologies (notably transgenics) transforming the seed sector through a technological revolution. While informal breeding and seed supply systems continue to exist, and indeed have been extensively supported through NGOs and other civil society groups, they are often under pressure, as drought, corruption and conflict take their toll and economic transformation and livelihood change continues apace, or they are ignored or excluded from policy circles.

The focus on *cereal* seed systems allowed this project to concentrate on a similar set of crops across the five study countries with a key influence on food security at household and national levels. Given the political reverberations of the ‘food crisis’ of 2007-08, this enabled

timely analysis of the implications of the policy processes shaping the breeding, production, marketing and distribution of cereal seeds. As this *FAC Working Paper* shows, whether grown for local subsistence or traded commercially, the significance of cereal crops to national politics (and therefore arguments about food security and sovereignty), commercial interests and local livelihoods is profound.

To gain clear insights into the policy actors, networks, interests and narratives at play, this project sought to test the hypothesis that contrasting politics and different configurations of interests will affect the way cereal seed systems operate and shape how a ‘New Green Revolution’ will ultimately play out. As such, the five country studies analysed their respective national seed policy processes by asking:

- How do seed policies get created, and by whom?
- How do ideas about what makes a ‘good seed policy’ change over time?
- How are boundaries drawn around seed problems and policy ‘storylines’ elaborated?
- Whose voices are taken into account in the seed policy process? And whose are excluded?
- What spaces exist for new ideas, actors and networks? How can these be opened up?

The underlying implication in all these cases is that politics matter and that by engaging critically with seed policy processes, we can begin to define and then deliberate among different framings and interests to shift the focus of the debate beyond the usual technical/market fix.

John Thompson and Ian Scoones, Project Co-ordinators (August 2010)

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Acronyms

AATF	African Agricultural Technology Foundation
ACDI/VOCA	Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance
AGMARK	Agricultural Market Development Trust
AGRA	Alliance for Green a Revolution in Africa
AFSTA	African Seed Trade Association
ASARECA	Association for Strengthening Agricultural Research in East and Central Africa
ASCU	Agricultural Sector Coordination Unit
ASTA	American Seed Trade Association
BASF	BASF Companies
BMG Found.	Bill and Melinda Gates Foundation
Bt	Bacillus thuringiensis
CGA	Cereal Growers Association
CIMMYT	International Maize and Wheat Improvement Center
CNFA	Citizens Network for Foreign Affairs
COMESA	Common Market for Eastern and Southern Africa
CRS	Catholic Relief Services
DAC	District Agricultural Committee
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FIPS	Farm Inputs Promotion Services
GR	Green Revolution
GDP	Gross Domestic Product
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDRC	International Development Research Council
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IRMA	Insect Resistance Maize for Africa
KARI	Kenya Agricultural Research Institute
KEBS	Kenya Bureau of Standards
KENADA	Kenya National Agro-dealers Association
KENFAP	Kenya National Federation of Agricultural Producers
KEPHIS	Kenya Plant Health Inspectorate Services
KIPI	Kenya Industrial Property Institute.
KMDP	Kenya Maize Development Programme
KSC	Kenya Seed Company
NAAIAP	National Accelerated Agricultural Inputs Access Programme.
NALEP	National Agricultural and Livestock Extension Programme
NCPB	National Cereals and Produce Board
NCST	National Council of Science and Technology
PASS	Programme on African Seed Systems
PBAK	Plant Breeders Association of Kenya
PBS	Programme on Biosafety
PCPB	Pest Control Products Board
Rockefeller	Rockefeller Foundation
SRA	Strategy for Revitalizing Agriculture
STAK	Seed Traders Association of Kenya
UPOV	International Union for the Protection of New Varieties of Plants
USAID	United States Agency for International Development
WEMA	Water Efficient Maize for Africa
WTO	World Trade Organisation

Abstract

The Government of Kenya, with the backing of development and charitable organisations, has been implementing programmes to increase agricultural productivity and rural incomes and trigger a new Green Revolution (GR). These activities focus on increasing farmers' access to and application of modern farming inputs, particularly improved seeds and fertilisers, delivered mainly through agro-dealers. Given that Kenyan farmers operate in a highly heterogeneous environment, this study was motivated to ask: Can agro-dealers deliver the Green Revolution in Kenya? In answering this question, the study examined the evolution and characteristics of agro-dealers in the cereals subsector and explored how they command a central position in policy narratives put forward by key actors in the policy arena, each advocating a new GR for Kenya.

Several key findings emanate from this study. First, both formal and informal seed systems are important channels for delivering cereal seeds to Kenyan farmers. The informal systems (which do not involve agro-dealers) provide seeds of local maize and other cereals to farmers in low rainfall areas in the greater Eastern region of the country. Conversely, the formal systems use agro-dealers in providing mainly improved maize seed to farmers in high rainfall areas of the greater Western and Central regions of the country. Notwithstanding the importance of the informal systems to many smallholder farmers, the legal, regulatory and policy frameworks, which are informed by international seed policies and conventions, tend to favour the formal systems. As a result, agro-dealers may only spur a GR for a select group of privileged producers, mainly maize farmers operating in higher rainfall areas.

Second, while actors in the seed industry employ different approaches in their activities, they are driven by narratives put forward by particular key actors, all converging on the notion of the 'agro-dealer' as the carrier of improved seeds to farmers. Interestingly, while the actors promote the agro-dealer agenda, due to different politics and interests, they also support parallel activities that seem to undermine development and expansion of the agro-dealer network in some places.

Third, Kenyan agro-dealers engage in the sale and promotion of diverse commodities as a risk coping mechanism for business survival. Therefore, initiatives aimed at supporting agro-dealers ought to focus on the totality of the business instead of only seeds and fertilisers. As well, if agro-dealers are to deliver a GR in Kenya, capacity training programmes for agro-dealers should not only target the business owners but also 'managers' (i.e., those who actually serve customers and are responsible for dispensing advice and information as well as products).

Fourth, the universalising of agro-dealer narrative in GR programmes overlooks the heterogeneity of the 'poor smallholder farmers' and agro-dealers themselves. This has resulted in biased beneficiary targeting and disproportionate 'wins' for farmers and agro-dealers in high rainfall areas and large agro-dealers in low rainfall areas.

Therefore, greater attention must be paid to meeting the needs of farmers in lower potential areas by developing innovative alternative business models. Such models might include sale of complementary non-agricultural products or services or the establishment of group-based agro which might operate part-time or on a not-for-profit basis as a service to their community. Alternatively, mobile agro-dealers might provide regular or periodic services to more remote areas that cannot sustain permanent agro-dealerships. In short, efforts must be made to move away from the 'one-size-fits-all' agro-dealer model as it is currently construed.

Finally, the GR programmes have been viewed by critics as a 'Trojan horse' for genetically modified (GM) seeds or simply a strategy to 'roll out a gene revolution' in Africa. As these new seeds have yet to be released widely, the extent to which agro-dealers have the knowledge and ability to coordinate local-level implementation of national biosafety regulations has yet to be determined and it therefore remains an area requiring further investigation. Given their limited capacity to provide timely advice and information on non-GM technologies to the majority of Kenya's farmers, however, it is clear that careful consideration is needed before loading agro-dealers with even greater responsibilities and expectations.

1. Introduction

In a bid to return the country to food self-sufficiency, the Government of Kenya has been spearheading strategies for a 'Green Revolution' in the food producing sector as spelt out in the Strategy for Revitalizing Agriculture (SRA), a 10-year plan, launched in 2004 (Republic of Kenya 2004), and entrenched in the Vision 2030¹. Key among these strategies is the increased generation, promotion and use of modern farming inputs and technologies, particularly improved seed and fertiliser. Small-scale, independent stockists, referred to as 'agro-dealers', are seen to have a crucial role in distributing these inputs in a liberalised economy. As key actors in the new 'Green Revolution', agro-dealers are thus at the centre of the current policy discussion about the future of Kenya's cereal sector.

This paper charts the rise of agro-dealers in recent national policy debates on agricultural innovation and food security and explores how they command a central position in new efforts to spark a smallholder-led revolution. It also examines the major narratives put forward by key actors in the agricultural policy arena and the competing agendas and visions of a new Green Revolution for Kenya they represent. Finally, drawing on key informant interviews and a survey of agro-dealers in two districts, the paper assesses the different politics and interests at play and the implications these raise for future investments in formal and informal seed systems and the promotion of agro-dealers as catalysts of change in the agricultural sector.

Agriculture is among the most important sectors in Kenya, contributing about 24 percent of the national Gross Domestic Product (GDP) and supporting about 80 percent of the population (Kibaara 2006). The main

feature of the sector is its domination by small-scale farmers, who account for 75% of total agricultural production (Kinyua 2004). Cereals are the most critical crops for food security in the country. Maize, wheat, sorghum, millet, rice, barley and oats are the seven cereal crops grown in Kenya. Of these, maize is the most widely grown, occupying about 50 percent of total cultivated area and 78 percent of total area under cereals. Sorghum and wheat are each grown in 7 percent of the total cereal area, while the cereal area share of millets is 6 percent. Rice, barley and oats together occupy about 2 percent of total cereal area². Maize is hence the most important cereal and staple crop in the country.

Productivity trends in Kenya show a marginal increase in aggregate cereal³ yields from an average of 1.3 tonnes/ha in early 1960s to about 1.7 tonnes/ha in the mid 2000s (see FAOSTAT). The initial growth in cereal output in the early 1960s through the late 1970s was attributed mainly to expansion in area under production, since aggregate productivity of major cereals remained relatively constant. However, in the mid 1970s through the early 1990s, maize yields rose steadily from 1.3 to 1.8 tonnes per hectare, and this growth in yields was attributable to government support through investment in research, extension and use of modern inputs such as improved seeds, fertilisers and chemicals (Odhiambo et al. 2004).

In the late 1980s through early 1990s, the government embarked on radical donor-driven liberalisation policy reforms meant to significantly reduce its involvement in economic activities. Although it had been hoped that these policies would bring about increased agricultural output and productivity, this was not achieved (Nyoro 2002). Aggregate cereal production declined after liberalisation, from 3.1 million tonnes in the 1987 to 2.5 million tonnes in 1993 and remained below its pre-liberalisation level until the mid 2000s. Similarly, aggregate cereal yields declined from the pre-liberalisation average of

about 1.6 tonnes/ha to 1.4 tonnes/ha in the late 1990s, before climbing steadily to 1.6 tonnes/ha in the 2005. (Appendix 1)

A key impact of liberalisation on food security is that the output of maize and other main cereals has remained below consumption requirements, making the country a net food importer and prone to perennial food insecurity (Appendix 2). Mose et al. (1997) and Nyangito et al. (2004) attribute this to weaknesses in and low efficiency of technology development and transfer due to inadequate government investment in research and extension; unfavourable legal framework; underdeveloped private sector; inadequate linkages among agricultural sector agencies; high cost of farm inputs; poor marketing and infrastructure; limited access to credit; and ethnic conflicts. Thus both studies recognise the poor performance of the agricultural sectors as a result of post-liberalisation political, structural and economic constraints.

The agricultural sector performed dismally in the 1990s, plunging into the sub-zero growth rates by the year 2000 (Nyoro and Ariga 2004). Following this, the government began calls for a turn-around of the sector in the early 2000s, culminating in the preparation of a policy document dubbed The Strategy for Revitalizing Agriculture (SRA), by the Ministries of Agriculture, and Livestock and Fisheries Development (Republic of Kenya 2004). The SRA greatly emphasises the need to increase farmers' access to high quality modern farming inputs, among them seeds, fertilisers and pesticides; in a bid to increase agricultural productivity and consequently achieve a Green Revolution in Kenya.

In the context of a liberalised economy that Kenya is, agro-dealers are seen to have a crucial role in distributing these inputs to farmers. As key actors in the new Green Revolution, agro-dealers are thus at the centre of policy discussion about the future of the cereal sector. However,

Figure 1. Map of Kenya showing the study districts



while it may be convenient in policy to present Kenyan (smallholder) farmers as a homogeneous group, they are practically heterogeneous in terms of agro-ecological, economic and socio-cultural environments in which they operate and their preferred crop enterprises. In this context, a critical question that must be answered is: Can agro-dealers deliver the Green Revolution in Kenya?

In a bid to answer the above question, this paper examines the evolution and characteristics of agro-dealers in the cereals subsector and explores how they command a central position in policy narratives put forward by key actors in the policy arena, each advocating a new Green Revolution for Kenya. Taking a historical and political economy perspective, the paper assesses the different politics and interests at play, and the implications this has for seed systems and the role of agro-dealers in particular.

Several techniques were employed to gather, analyse and present information in this study. These included an extensive review of relevant literature from published works and websites of key organisations; mapping actor network in Kenya's cereal seed systems to identify key actors, their roles and relations (see maps of actor-networks for the period before and after fieldwork in Appendix 3 and Appendix 4 respectively); analysis of narratives in policy documents of key organisations and programmes; semi-structured discussions with key informants and actors in the cereal seed sector; an agro-dealer survey involving 55 purposefully selected agro-dealers in Uasin Gishu and Machakos districts⁴ representing high and low rainfall areas in Rift Valley and Eastern Provinces respectively (Figure 1); and three case studies of recent programmes being implemented in the country, with the agro-dealer at the core. Field research and interviews for this study were conducted between September 2009 and February 2010.

The rest of the paper is organised as follows: section two puts the Kenyan Green Revolution philosophy, key actors and actor networks into context, by assessing its foundations and technology delivery mechanisms. In section three, cereal seed systems in Kenya are examined, highlighting the various actors and their networks, and how their activities and interests shape the agro-dealership. Section four looks at agro-dealers in Kenya's cereal seed systems, by presenting the results of an agro-dealer study, which define and characterise them. In section five, three Green Revolution programmes driving the agro-dealer agenda in cereal seed systems are assessed, while the findings of the this study are synthesised in the final section.

2. The Kenyan Green Revolution

2.1. Foundations and Support

Kenya's Green Revolution, as indicated above, is anchored in the SRA, which was inspired by the Economic Recovery Strategy for Wealth and Employment Creation 2003–2007–ERS (a broader policy initiative for improving the overall economic and social development in the country), and the Millennium Development Goal number 1, which

aims to eradicate extreme poverty and hunger by 2015 (Republic of Kenya 2004). Noting that agriculture contributed more than half of the country's GDP directly and indirectly, and supported about four fifths of the country's population, the government linked the then dismal performance of the overall economy directly to the underperformance of the agricultural sector, and postulated in the SRA that 'to significantly reduce poverty and unemployment in Kenya, a Green Revolution-type action is required'. In the foreword of the SRA, the president of the Republic of Kenya, Hon. Mwai Kibaki, declared that 'the implementation of the strategy will be the beginning of a Green Revolution in Kenya' (Republic of Kenya 2004).

The notion of a Green Revolution encompasses significant increase in agricultural productivity, emanating from widespread application of modern inputs such as high-yielding crop varieties, mineral fertilisers and pesticides (Cartridge and Leraand 2007). As envisaged in the SRA, the Kenyan Green Revolution strategy aims to raise real agricultural output by 3.1 percent in 2003–2007 and by 5.0 percent thereafter. The strategies employed address three key constraints to agricultural productivity, which include inadequate productivity-enhancing technologies; high input costs; and inadequate knowledge on available appropriate technologies and husbandry techniques among farmers (Republic of Kenya 2005).

Similar calls for a Green Revolution-type action in the country have been echoed by a number of actors, key among them being the United States Agency for International Development (USAID). USAID supports a number of projects in the country through its Agriculture and Micro-enterprise programme, whose agricultural component has as its first objective 'increased agricultural productivity in maize, dairy and horticultural subsectors' (USAID 2009: para. 3). Among the main projects funded by USAID in Kenya's maize subsector is the Kenya Maize Development Program (KMDP). The programme has been implemented since 2001 by Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance (ACDI/VOCA), a Washington-based international non-governmental organisation (NGO), in partnership with Cereal Growers Association (CGA), Farm Input Promotion Services Africa Ltd (FIPS) and Kenya Agricultural Commodity Exchange (KACE).

Implementation of the KMDP is anchored in the belief that, coupled with a number of other factors, increased maize productivity can 'dramatically alter the economic contribution of the subsector' in economic growth and poverty reduction (ACDI/VOCA 2009a). The first objective of the KMDP is increased productivity, which is achieved through promoting increased adoption of improved maize varieties, fertilisers and agronomic practices among smallholder farmers. However, the productivity increasing activities of the programme are limited to regions considered as 'critical' or 'important' maize growing areas, under the programme. These include the high rainfall areas of Rift Valley, Western, Central and Nyanza Provinces (ACDI/VOCA 2009b).

The other significant supporter of the government's call for a Green Revolution is the World Bank (WB). In the World Development Report for 2008, the WB's President

remarked that 'agricultural productivity growth is vital for stimulating growth in other parts of the economy'... and 'a strong option for ... overcoming poverty and enhancing food security' (World Bank 2007:xiii). He envisaged that this agricultural growth will come from 'sharp productivity increase in smallholder farming combined with more effective support to the millions coping as subsistence farmers, many of them in remote areas' (World Bank 2007:xiii). In line with this philosophy, albeit retrospectively, the bank has supported the Government of Kenya in implementing projects aimed at increasing agricultural productivity and food security.

Among the key WB-funded agricultural projects in Kenya is the 12-year Kenya Agricultural Productivity Project (KAPP), for which the Bank committed US\$40 million in the initial 3-year phase and a further US\$82 million in the second phase⁵. Started in 2004, the project aims to:

The project's development objective is to improve the system supporting generation, dissemination, and adoption of agricultural technology through: (a) reforms in extension to increase pluralism, responsiveness to clients, and participation by private providers; (b) evolutionary change in the existing system of agricultural research to improve accountability and impact; and, (c) increased empowerment of producer organizations to influence the planning, design, implementation, funding and monitoring and evaluation of research, extension, training and capacity building activities. (World Bank 2004: 2)

Yet, another ardent supporter of Kenya's Green Revolution call is the powerful Nairobi-based donor organisation, the Alliance for a Green Revolution in Africa (AGRA) – a partnership between the Rockefeller Foundation and Bill and Melinda Gates Foundation. In his speech delivered at the International Conference on Food Security in Abuja, Nigeria on 23-24 July 2008, AGRA's Vice President Dr. Akinwumi Adesina asserted that AGRA is 'dedicated to helping millions lift themselves out of poverty and hunger by dramatically improving the productivity ... of small-scale farmers across Africa' (AGRA 2009b: para. 15). Since 2006, AGRA has been championing agricultural development in African countries, including Kenya. Through its Programme for Africa's Seeds Systems (PASS), funded to the tune of \$150 million over the initial five years, AGRA aims to 'develop seed systems that deliver new crop varieties to smallholder farmers efficiently, equitably and sustainably' (AGRA 2009e). An example of AGRA's Green Revolution programmes in Kenya is presented in section 5.

Kenya's Green Revolution campaign is also implemented under strong political pressure from the Comprehensive Africa Agriculture Development Program (CAADP), the highest policy framework for accelerating agricultural development and food security in Africa, established under the AU/NEPAD, African Union's New Partnership for Africa's Development (COMESA Programmes 2009). Established in 2003 as the product of the so called 'Maputo Declaration', CAADP targets to

raise national agricultural growth rates to an average of six percent per year. Under this initiative, member countries have committed themselves to increase resource allocation to Agriculture and Rural Development to at least 10 percent of national budgets to support among other activities, improvement in agricultural research; technology dissemination and adoption (see the fourth pillar of CAADP).

Implementation of CAADP in Kenya is strongly linked to increased budgetary allocation to Agriculture sector, from 4.6 percent of the national budget in 2004/05 financial year, to 7.8 percent in 2007/08 (Institute of Economic Affairs 2008; Kibaara et al. 2009b). Further increase in budgetary allocation in coming years is expected as the country focuses on implementing the Vision 2030 policy. For instance, in his speech during the opening of the 2nd Biannual National Agriculture Sector Conference in Nairobi on 11th November 2008, the President of the Republic of Kenya, Hon. Mwai Kibaki stated: 'we are ready to increase the funds allocated to the agricultural sector so as to improve the sector...'; and promised to increase agriculture's budgetary allocation to 8 percent of the national budget (Office of Public Communications: para. 3).

However, doubts are being raised as to whether increased budgetary allocation will automatically lead to realisation of the new Green Revolution. For instance, recent CAADP implementation country reports by the Global and Regional Advocacy for Small Producers (GRASP)⁶ show that even countries that had achieved 10 percent budgetary allocation to agriculture had not attained the targeted 6 percent growth rates (GRASP 2009). GRASP argues that performance of agricultural sector will be determined by the kind of agricultural and development policies that countries pursue and how well they are targeted; regulatory frameworks and macro-economic policies; exogenous factors such as weather and global prices; and opportunities presented to small holder farmers by the private sector and donor community. Other factors that may negatively affect or delay outcomes of the CAADP and hence Green Revolution in Kenya are lack of the agriculture sector ministries' capacity to utilize the incremental funds (Institute of Economic Affairs 2008) and politics within the implementation circles of the SRA and CAADP, where some members of teams coordinating agricultural programmes see CAADP as a parallel programme to the SRA (Kibaara et al. 2009b).

This section has revealed the increased use of modern technologies as a common key objective in Green Revolution narratives. However, policy challenges abound with respect to how the technologies would be availed especially to the poor smallholder farmers, in order to realize the envisaged productivity growth. The next section explores the different pathways that have been used in the country to deliver improved inputs to farmers, particularly fertilisers and seeds, in order to shed light on key actors and interests driving the Green Revolution agenda in Kenya. It also highlights pathways that are likely to be pursued by different actors in future and how these might impact on agro-dealership and input accessibility for small farmers.

2.2. Delivering the Technologies for the New Green Revolution

Different input channels have been used to deliver the various technologies for the new Green Revolution. The main channels that have been used in Kenya include public institutions, involving state corporations and public extension system; commercial channels, involving private seed companies and their networks of distributors (agro-dealers); and charitable organisations, involving donor agencies, non-governmental organisations (NGOs) and relief agencies. The predominant actors and channels have changed with the shift from a public input distribution system to a fully liberalised system.

Public input distribution and information dissemination system was dominant in the pre-liberalisation period, controlling seed variety development and production, and pricing and marketing of inputs (Argwings-Kodhek et al. 2004; Ochieng pers. comm. 2009). The main actors in cereal inputs arena were the Kenya Agricultural Research Institute (KARI), which was mandated to develop new crop varieties and implement the seed industry laws; the Kenya Seed Company (KSC), which produced and distributed the new cereal varieties developed by KARI; the Kenya Farmers Association (KFA), later renamed Kenya Grain Growers Cooperative Union (KGGCU), which procured and distributed fertilisers and other inputs, and acted as an agent for KSC; the Agricultural Finance Corporation (AFC) which advanced inputs credit to farmers; and the National Cereals and Produce Board (NCPB) which bought cereal grain from producers and recovered input credit advanced to farmers on behalf of AFC.

This system, however, mostly benefited the large scale cereal producers and farmers in high rainfall areas, who were also well served by good infrastructure, particularly in Rift Valley and Central Kenya (Freeman and Omiti 2003; Nyangito 2008). In the mid 1980s, however, mismanagement and political interference at KGGCU resulted in inefficiencies that brought down this input distribution system (Nyoro 2002). This failure of the public distribution system triggered the push for liberalisation of the cereal input sector, especially by the World Bank and International Monetary Fund (IMF). In 1990, the government abolished import quotas and licenses and deregulated prices in fertiliser industry (Omamo and Mose 1999). The liberalisation policies also allowed traders to break down the traditional 50 kg bags into small packs, in the hope that this would spur the use of fertiliser and increase productivity among smallholder farmers (Freeman and Omiti 2003). In 1996, the seed industry became fully liberalised and an autonomous industry regulator, the Kenya Plant Health Inspectorate Services (KEPHIS) was established to take over the regulatory role from KARI (Ochieng pers. comm. 2009).

Liberalisation policies were meant to pave the way for a market-based economy in which the private sector would take over functions such as input distribution from the state. Following liberalisation in Kenya, private companies and urban and rural traders entered the inputs market, dismantling the monopolistic network of public actors in input distribution in most parts of the

country. However, market development has been slow due to capital constraints, restrictive trade and licensing arrangements and restrictive domestic laws in the seed industry, as stipulated in the SRA (Republic of Kenya 2004). This has led to inadequate competition and consequently high input prices, constraining the adoption of improved technologies by poor smallholder farmers, especially in low rainfall areas. As the next sections reveal, the government is not about to exit from input distribution. In fact, there have been calls, for instance by AGRA, for African governments to facilitate access to inputs by resource-poor smallholder farmers through input subsidies (AGRA 2009d). Thus, in the recent past, the Kenyan government has been actively involved in input distribution programmes, with backing from development partners such as AGRA, the World Bank and FAO.

In a bid to bridge the gaps created by input markets, another input distribution system emerged in the early 1990s in the form of seed aid, championed by local and international NGOs and relief agencies. These organisations have been working mainly in the low rainfall areas and areas affected by disasters such as droughts, floods and civil unrest. The organisations employ strategies such as direct input distribution and market-based approaches such as seed vouchers and fairs (Sperling et al. 2008). The key actors who undertake relief seed distribution include the government and philanthropic organisations, key among them being Catholic Relief Services (CRS), Action Aid, World Vision, the Kenya Red Cross Society and several local NGOs. However, relief seed programs are have been accused of lacking sensitivity to local seed systems; creating dependency in farmers; distorting prices and undermining the growth of local seed markets; and reliance on unsustainable external support (Tripp 2001; Muhammad et al. 2003).

In this section we have sought to demonstrate how a strong core coalition of actors has emerged in Kenya, focused on stimulating a new Green Revolution through the application of new technologies, particularly seeds and fertilisers, delivered by the private sector (multinational and local seed companies) with backing from the state, donors and philanthropic organisations. This core actor network sees agro-dealers as central. In order to contextualise the role of agro-dealers, however, the wider cereal seed system needs to be understood, together with the key actors involved in seed policy. The next section looks at the cereal seed systems and actors actor-networks in Kenya and how their positioning, interests and activities shape the cereal seed sector in general and agro-dealership in particular.

3. Actors and Networks in Kenya's Cereal Seed Systems⁷

3.1. The Main Cereal Seed Systems

In Kenya, there are two interacting and overlapping types of seed systems: the formal and informal. Formal seed systems are also collectively known as the organized sector or the formal seed sector and are generally

represented by all official or organized seed production and supply programmes. In these systems, activities along the entire seed value chain are guided by defined methodologies which are also internationally standardized, and backed by national legislation. As shown in Table 1, the formal seed sector supplies about 60 percent of cereal seed used in the country. However, this figure varies depending on the crop, with seeds for production of cereal crops other than maize coming mainly from the informal sector. In addition, use of formal maize seed, which ranges from 0 percent in coastal lowlands to 90 percent in high potential maize zone, is concentrated in high rainfall areas found mainly in Central, Rift Valley and Western Provinces⁸ (Figure 2).

The formal seed sector boasts of about 445 registered varieties, of which about 50 percent are of cereal crops (KEPHIS 2009). The 222 cereal crops varieties are dominated by maize, which has 164 varieties (74 percent), followed by wheat with 21 varieties (9.5 percent), sorghum with 18 varieties (8 percent), millet with 7 varieties (3 percent), barley with 7 varieties (3 percent) and rice with 5 varieties (2 percent). However, about three quarters of the registered maize varieties are suitable for medium to high altitude areas, which also receive high rainfall; whereas only about one quarter of the varieties are suitable for the low altitude areas, most of which also receive low and erratic rainfall.

Kenya's formal seed systems exhibit several constraints that limit their effectiveness in delivering improved seed to farmers for the realisation of a Green Revolution. These include:

- inadequate information about availability, characteristics and performance of new varieties among both farmers agro-dealers;
- low and unpredictable seed demand, particularly among the poor smallholder farmers and those in low rainfall areas, leading to low availability of improved seeds in such areas;
- distant and unreliable seed sources, which increase seed costs for farmers;
- high retail prices compared to informal seed, making adequate formal seed unaffordable by most farmers;
- poor quality of formal seed despite the stringent seed certification and quality control mechanisms enforced by KEPHIS; and
- tendency of the formal seed systems to focus on maize hybrids and high rainfall areas, giving less attention to open pollinated varieties (OPV) and other dryland crops.

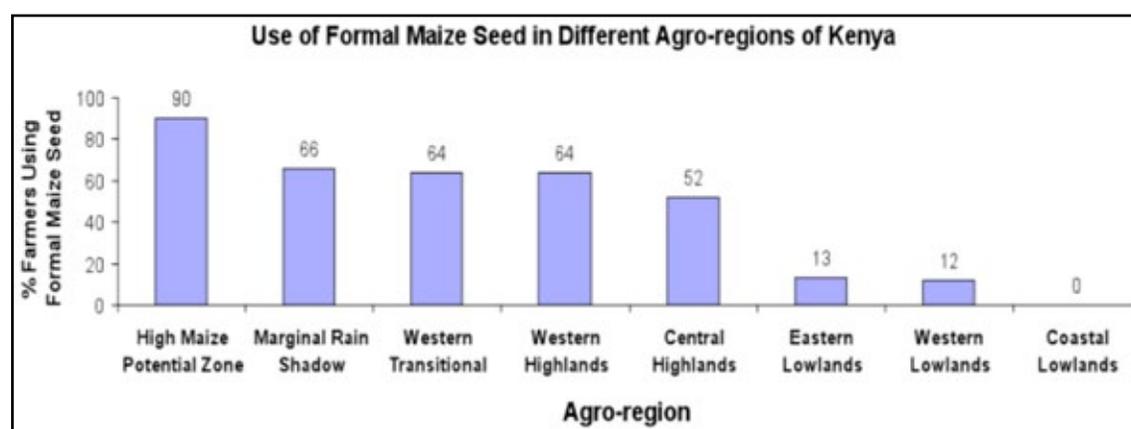
Informal seed systems, also known as farmer seed systems, local seed supply or traditional seed sector, are comprised of farmer-managed seed production activities and are based on indigenous knowledge and local diffusion mechanisms. The systems include methods such as retaining seed on-farm and farmer-to-farmer seed exchange networks. Farmer seed systems do not strictly distinguish between 'seed' and 'grain': seed production is essentially the same as and part of grain production. 'Seed' is normally selected from grain crop, based on physical characteristics observed in the farm. These seed systems operate mainly at the community level and because of their local specificity to needs and preferences

Table 1. Seed demand and supply situation for main cereal crops in Kenya (2005)

Crop	Total seed Demand (tons)	Formal Seed Supply (tons)	Proportion of Formal seed (%)	Proportion of Informal seed (%)
Maize	44,015	27,500	62	38
Sorghum	1,224	433	35	65
Millet	739	175	24	76
Rice	1,275	300	24	76
Total	47,253	28,408	60	40

Source: Adapted from Ayieko and Tschirley (2006)

Figure 2. Use of formal maize seed in different agro-regions of Kenya (2004)



Source: Authors, using data from Ayieko and Tschirley (2006)

of farmers; they provide most of the cereal seed that farmers use, with exception of maize hybrids and high rainfall areas. Farmers access informal cereal seeds mainly from their own farms, other farmers, local grain markets, NGOs, CBOs and relief agencies.

The informal seed sector, just like the formal sector faces a number of weaknesses. The main constraints include:

- lack of adequate seeds to meet farmers' needs, occasioned by low grain production and utilisation of grain meant for seed as food after prolonged droughts;
- poor linkage of informal systems with public research and formal seed sector, resulting to severe difficulties in accessing seed of new improved varieties to replace existing ones; and
- lack of skills and capacity among most farmers to effectively maintaining high genetic purity in cross pollinated crops and control seed borne diseases and humidity problems in storage, thereby jeopardising seed quality.

Notwithstanding their advantages and challenges, informal seed systems get little support particularly from the government, compared to the formal systems. For instance, informal seed is not recognised by law and trading in uncertified seeds is prohibited according to Regulation 17(1) of the Seeds and Plant Varieties (Seeds) Regulations, 2009. Further, all provisions of the existing seed legislation regarding seed production, processing, packaging and distribution are based on international seed laws, whose domestication has resulted in local seed legislation that by and large is not conducive for development of the informal system. The provisions of these laws imply that the almost 80 percent of all seed used in Kenya, which is informal, is technically 'illegal' (Ayieko and Tschirley 2006).

The Ministry of Agriculture's policy is to encourage farmers to grow improved crop varieties and use certified seeds. Therefore, the Ministry does not have elaborate programs for supporting informal seed systems (but the Ministry's staff assists farmers in selecting seed of improved legumes and maize composites where certified seed is unavailable⁹). In the draft Seed Policy (Republic of Kenya 2008b), the government declares that it will support the informal seed sector, but also contends that this support is aimed at 'transforming it to the formal sector'. Contrary to the limited support for the informal sector, there are many initiatives by the government supporting the formal sector, such as developing policies to guide the sector and training various actors in the seed industry by extension staff and KEPHIS. This biased support for formal sector inherently gives high rainfall areas a greater advantage over dry areas in food production, given the centrality of seed in agriculture.

In summary, none of the seed systems in the country can effectively and sustainably deliver all seeds that meet the demands of all farmers, since the preferences and socio-cultural and ecological conditions of farmers are too diverse. The Green Revolution concept is anchored on improved varieties, which are delivered to farmers mainly through private sector-led formal seed systems. However, the above literature has clearly demonstrated

that the profit-driven private formal seed sector in the country serves mainly the maize sub-sector, high rainfall areas and better resource-endowed farmers and therefore inherently locks out some categories of farmers. If the country is to achieve a Green Revolution for most, if not all farmers, there is need for government to review its policies and allow for development of both systems or interfacing of the two systems.

3.2. Actors and actor networks

Before liberalisation of the seed industry, the seed sector in Kenya was dominated by public actors who controlled industry, policy and regulation, variety development, and seed production and distribution, in an intricate monopolistic arrangement. However, since liberalisation, significant reorganisation has occurred in the industry, bringing in more players and redefining the mandates of existing ones. This section highlights the main actors and their roles and relations.¹⁰ The configurations of actor network especially in influencing agro-dealer agenda is also reviewed in this section but contextualised and elaborated in section 5.

Ministry of Agriculture

The main responsibility of the Ministry of Agriculture (MOA) is development and coordination of policy and strategies for the industry, and therefore its role is to create the right environment for smooth operation of the industry. The MOA facilitates research, provides advisory and information services, reviews policy and regulatory framework and facilitates partnerships among industry players. It regulates the seed industry mainly through the Kenya Plant Health Inspectorate Services (KEPHIS)¹¹. KEPHIS collaborates with District Agricultural Committees (DACs) to regulate agro-dealerships¹².

The thrust of government's policy on seeds and other farm inputs, as contained in the Strategy for Revitalising Agriculture (SRA), is to improve quality, accessibility and affordability of the inputs. This is expected to be achieved through strengthening of quality control institutions; training input suppliers on quality maintenance; strengthening of public input supply organisations such as KFA and Agricultural Development Corporation (ADC); expanding the capacity of national agricultural research system to produce adequate quantities of breeder seeds; promoting private sector investment in input business; building stockists' (agro-dealers') capacity to increase input supply and provide information and marketing services; building capacity of farmers' organisations to procure inputs in bulk and resell to members; reviewing tax system to eliminate tax on agricultural inputs; and facilitating access to agricultural credit by reviewing credit and financial regulations.

Although the MOA envisages a seed (input) industry that is largely market-driven, it does not seem prepared to completely surrender input supply to market forces, as implied by the intended revival of public input supply organisations mentioned above. Moreover, it directly participates in the inputs market by supporting programmes that distribute (subsidized) seeds and fertilisers to smallholder farmers who are unable to access

them due to poverty or natural disasters such as droughts, floods and civil conflicts. While some of these programmes involve agro-dealer participation and support, others bypass the agro-dealers¹³ and are deemed by some actors in the industry as interfering negatively with the market and creating confusion (Nyoro and Ariga 2004).

On the other hand, according to MOA officials, the government feels it has a social responsibility to its citizens, which warrants direct intervention in inputs market where the private sector is incapable or unwilling to improve access to inputs, particularly following disasters or among the vulnerable groups. But some analysts also see pursuit of political stability as the other underlying interest motivating government involvement in inputs markets (COMESA 2009). While these interests imply that the government may take a much longer time to relinquish input supply function to the private sector (if this will ever happen), it also raises an important question as to whether agro-dealers can be relied on to spur a Green Revolution among the poorest smallholder farmers and in the Arid and Semi-Arid Lands (ASAL).

Research Institutions

The public research is the mandate of the Kenya Agricultural Research Institute (KARI) a semi-autonomous body under the Ministry of Agriculture (MoA). KARI with its regional Agricultural Research Centres (ARCs) represents the main agency responsible for the coordination of agricultural research in the country. Its functions include plant breeding, production of breeder/foundation seed, and its supply to basic seed producers.

Kenya has had a long history of research on cereal crops such as maize, wheat and barley since early 1960s. In 1970s and 1980s, there was a proliferation of international research organizations in the country. Kenya has the highest concentration of international agricultural research centres in Africa (IARCs). Following the collapse of the East African Community in 1977, the government established the National Council of Science and Technology (NCST) to co-ordinate activities of the National Agricultural Research Institutes (NARIs). The NARIs comprised mainly of two formal categories; the public and the private sectors and a small third group referred to as civil society. Many of NARIs in Africa fell under the influence of the public research sector with the CGIAR system playing an important role in setting the research agenda of Green Revolution (GR).

The international actors in cereal crops research include the International Maize and Wheat Improvement Center (CIMMYT), which is mainly on maize research and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) whose mandate cereal crops are sorghum and millets --work very closely with KARI in variety development. One of research projects implemented by CIMMYT in partnership with KARI and other actors entails active participation of agro-dealers (see section 3).

Regionally, the research institutions are affiliated to the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA)¹⁴. ASARECA is further affiliated to the Common Market for Eastern and

Southern Africa (COMESA), where it a lead partner in Pillar 4 of the Comprehensive Africa Agriculture Development Program (CAADP)¹⁵, implemented by COMESA on behalf of the African Union's New Partnership for Africa's Development (AU/NEPAD) (COMESA Programmes 2009a; 2009b). ASARECA is supported by a number of donors, including USAID (the coordinator), World Bank, DFID (UK), the European Union, CIDA and IDRC (Canada), the African Development Bank, the International Fund for Agricultural Development (IFAD), and SIDA (Sweden) (USAID East Africa 2009). Through the support of its partners, ASARECA has been spearheading seed policy development and harmonisation in member countries, to facilitate regional access to improved varieties. Another regional organisation is the African Agriculture Technology Foundation (AATF). AATF is a Nairobi-based not-for-profit organisation established to facilitate and promote public/private partnerships for the access and delivery of appropriate proprietary agricultural technologies for use by resource-poor smallholder farmers in Sub-Saharan Africa' (SSA) (AATF 2009: para. 1).

This brief discussion on the configuration of agricultural research institutions does not capture who are the big players and their influence in the Kenyan NARS. However a closer look at the actor-networks maps (see, for example, in Appendices 3 and 4), the relationship between KARI and the CGIAR centres is not all plain sailing and seamless cooperation. Instead, there are conflicts and politics at play. One area of conflict is on research focus. KARI and sub-regional research organizations (SROs) such as ASARECA and AATF have increasingly developed research strategies, which focus on market/economic growth whereas the IARCs have often focused on poverty eradication. While appreciating the good intentions for IARCs developing a research strategy with such broad objectives, KARI and SRO leaders nevertheless tend to feel that this may not be realistic --and they would prefer research systems to develop a strategy for more focused objectives. Closely related to this conflict is the view that most problems of African agriculture cover the entire supply chain: from production to post-production processing and marketing to weaknesses and inadequacies in support institutions and infrastructure. This may not require the type of production- and factor-oriented research currently being undertaken in the IARCs.

There is also politics at play towards sub-regional research organizations (SROs) such as ASARECA and AATF. In particular, financing of these research organizations is currently done by donors (see above the number of donors funding ASARECA) and there is little contribution from the member countries. This raises the questions of long term sustainability of these organizations. Another challenge relates to partnerships between IARCs and the NARS. For instance, it is not uncommon for each IARC (and sometimes each programme in an IARC) to establish a partnership with KARI. This increases the number of partnerships with KARI scientists, the majority who then end up spending more time servicing the IARC programmes. Even within these organizations there are different interests played out, say over what is the

appropriate technological trajectory of the Green Revolution and priorities in strategic and non-strategic research themes and collaborations.

Seed Companies

The primary role of seed companies is seed production and marketing, but a few also undertake research. Currently, there are about 73 registered seed companies in the country, but only a few are involved in cereal seeds. For instance, only 11 seed companies had registered at least one cereal crop variety in the country by 2009, as shown in Figure 3. About two thirds of the cereal varieties in Kenya are registered under KARI and the Kenya Seed Company (KSC), both of which are public organisations. Western Seed Company (WSC) is the only local private company with significant presence in the cereal seed market, having registered 13 percent of the total cereal varieties. There are four main foreign-based private seed companies, Pannar, AgriSeed, Monsanto and Pioneer, which contribute a total of 17 percent of registered cereal varieties in Kenya.

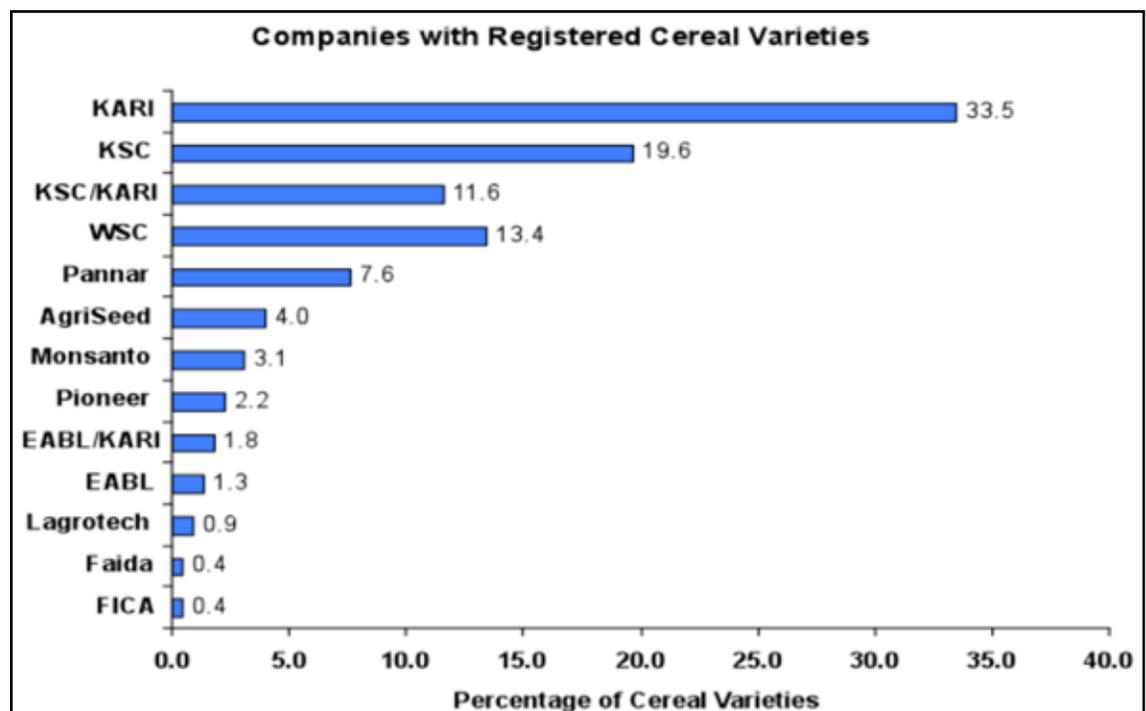
There is a significant organisation of seed companies at both national and regional levels: locally, they are members of Seed Trade Association of Kenya, STAK (which consists of about 50 percent of the registered seed companies); while regionally they are affiliated to African Seed Trade Association, AFSTA¹⁶. With the support of donors such as the Danish International Development Agency (DANIDA) – through the Business Advocacy Fund (BAF), STAK has been both vocal and influential in shaping seed policy in the country. For instance, STAK was instrumental in pressurising the government to form the Seeds and Plants Tribunal, to address seed trade disputes, which was done in 2006 and enact the Seeds and Plant Varieties

(National Performance Trials) Regulations 2009 and the Seeds and Plant Varieties (Seeds) Regulations 2009.

Seed companies participate in seed trade by performing either of the following activities: production, processing and marketing; importation, repackaging and marketing; or importing and marketing seed. Companies which produce seed in the country contract registered seed growers to produce the seed following the procedures and standards prescribed in the Seed and Plant Varieties Act (CAP 326). All seed companies have networks of stockists (agro-dealers) through which they distribute seed to farmers. However, some private seed companies interviewed felt that the playing field is tilted in favour of KSC for numerous reasons.

First, the close association of KSC with the public research (KARI) and industry regulator (KEPHIS), which is itself a 'historical accident', gives KSC unfair advantage and influence policy circles. For instance, the Seeds and Plant Varieties (Seeds) Regulations, 2009 gives KSC express representation in the Seed Regulation Committee (Regulation 5) and Seed Allocation Panel Committee or Seed Growers Allocation Panel (Regulation 6). These are powerful committees that are mandated to develop seed policy; modify certification standards; recommend registration or de-registration of seed merchants; moderate appeals; regulate seed certification fees; and select eligible applicants for growing seed crops for compulsory certification. Representation of other seed companies in these committees hangs in the balance: Regulations 5(2) and 6(2) only give each Committee the discretion to co-opt at most three other members to "represent such interests as it may time to time determine"; which means all other seed companies may only have up to three representatives.

Figure 3. Companies with registered cereal varieties in Kenya



Source: Adapted from KEPHIS (2009)

Secondly, KSC controls the seed market, supplying about 75 percent of all formal seed used in Kenya (STAK 2007). Further, KSC largely controls the seed distribution channel – especially the large agro-dealers from whom smaller agro-dealers purchase their seed stocks. This makes it hard for new companies to penetrate the market. Thirdly, KSC is the preferred source of seed for government-supported relief seed programmes which make huge purchases, and this is seen by competitors as unfair favouritism, as it promotes the business of one market player.

In addition to concerns about preferential treatment of KSC by the government, the seed companies also feel that the government should not be involved in direct distribution of subsidised inputs. They argue that in such programmes, this function ought to be performed by agro-dealers, in order to build their capacity and sustainability of input supply (COMESA 2009). However, the underlying motivation of the private sector argument is protection of their business interests. For instance, CNFA/AGMARK revealed that the newly formed Kenya National Agro-dealer Association (KENADA) will be lobbying the government to stop direct distribution of seed to farmers, because agro-dealers perceive this government act as injurious to their business.

The seed industry in Kenya has been regarded as one of the most developed in the region. However, it appears engaging in seed business may not be so easy after all, as there are some barriers that limit the ability of new actors to compete on a level playing field with established players. The policy and business environment favours one player over others, the Kenya Seed Company (KSC), and the sector is constrained by significant government interference. This state of affairs seems to contradict the government's intention to promote private sector investment in the seed industry as stipulated in the SRA. There is therefore need to review the industry policies in order to entrench fairness in the industry.

Donor Agencies and Non-Governmental Organisations

Donor agencies and Non-Governmental Organisations (NGOs) are involved in key areas of the seed value chain. They mainly finance and support seed research and development, production, promotion and distribution. Activities of donors and NGOs are in both the formal and informal sector. Previous interventions by NGOs and donors have focused more on seed variety development and adoption, involving farming communities in seed production, and seed aid.

Activities of donors and NGOs in the seed sector began in earnest in the 1990s following liberalisation of the seed (and fertiliser) industry. In the greater western part of the country (Rift Valley, Western and Nyanza Provinces) and some parts of the greater central Kenya, donor and NGO activities emphasize on market oriented (agribusiness) models of seed (mostly of maize) and fertiliser distribution. For instance, from 1995, an NGO known as Sustainable Community-Oriented Development Programme (SCODP) began implementing activities aimed at encouraging farmers to increase their use of

fertiliser in Western Kenya, with support from Rockefeller Foundation, USAID and German Agro-Action GAA (Wanzala et al. 2000). This project was informed by the narrative that 'farmers were unable or unwilling (or both), to invest in a whole 50kg bag' (Blackie and Albright 2005). SCODP's activities thus included breaking the large (50kg) fertiliser packs and selling to farmers in smaller packs of up to or less than 1kg; experimentation with 'minipacks'; and training of fertiliser stockists on business management and technical aspects of fertilisers.

Later, the SCODP model was expanded to cover other areas and technologies such as improved seed of maize and legumes, and herbicides. The narrative used was that 'with no weeding, even with heavy use of fertilizer, yields are negligible', and this was coupled with some body of knowledge positing that 'more frequently, weeding improves fertilizer use efficiency'; yet labour for this critical activity was constraining (Blackie and Albright 2005). Following these narratives, FIPS Africa, an NGO, was formed in 2003, to oversee the implementation of the expanded input promotion and supply programme, with financial support from DFID, USAID and the Rockefeller Foundation (Blackie and Albright 2005). FIPS Africa works with a number of private sector players such as seed companies (Monsanto, KSC and WSC) which provide free seed for promotions; a fertiliser company (Athi River Mining – ARM) which produces a blended fertiliser; and agro-chemical companies (Monsanto and Lachlan Agriculture – a Kenyan Agent for Dow Chemicals) to supply herbicide and Larger Grain Borer pesticide respectively.

In the greater eastern Kenya and other low rainfall areas (commonly known as Arid and Semi-Arid Lands – ASAL), most donor and NGO seed activities focus on seed aid and informal seed systems. These areas are targeted for intervention because they are believed to be ecologically and economically marginalized, prone to natural disasters and inadequately served by both the formal and informal seed systems (Omanga and Rossiter 2004). Seed aid in the ASAL, a collaborative effort between NGOs/donor agencies and the government, began in the country in 1992 as an emergency measure following severe droughts, and has since become almost an annual activity in these areas (Omanga and Rossiter 2004). Initial seed aid activities of the 1990s took the form of conventional seed procurement and distribution (CSPD). The rationale behind CSPD was that seed was unavailable in the disaster-affected areas. Following this assumption, the seed aid implementing agencies would contract registered seed companies to procure and deliver seed at the targeted areas. Seed would then be distributed directly to farmers through the implementing NGO, in collaboration with the provincial administration.

However, following the numerous challenges of implementing the CSPD and insights from several seed system studies, a new approach called the Seed Vouchers and Fairs (SVF) was introduced in the country by the Catholic Relief Services (CRS), with funding from the FAO and Swedish International Development Cooperation Agency – SIDA, in 2000 (Remington et al. 2002). Contrary to the

CSPD, the SVF was founded on the belief that seed is always available in a region, even after disasters – the problem is lack of accessibility by farmers. Based on this SVF system premise, the implementing agency issues needy farmers with coupons of a pre-determined value, which they exchange for seed of preferred crops and varieties at local seed stockists (for formal seed) or informal seed vendors (for informal seed). The seed vendors then redeem the vouchers for cash from the implementing agency. Therefore, in addition to providing farmers with more and diversified seeds than the CSPD, the underlying motivation for the SFV is business: the system supports seed market development. However, sustainability of the markets without donor support is not guaranteed, given that the SVF itself is a funded activity. This approach has also been recently adopted by the government to increase access to seed of improved maize varieties and fertilisers by resource-poor farmers in high rainfall areas, under the NAAIAP.

Other seed activities funded by NGOs/donor agencies in the ASAL are community seed programs, which entail seed bulking as a key activity. The programs mainly target cereals including maize, sorghum and millet OPVs (open pollinated varieties) and grain legumes such as beans, pigeonpeas, cowpeas, green grams (mung bean) and dolichos. A study by Muhammad et al. (2003) reports that under these programs, the implementing agencies source improved crop varieties mainly from the KARI seed unit (KSU)¹⁷ and distribute them to farmers for grain production and seed bulking. At the end of the season, each beneficiary farmer is supposed to return to the implementing agency part of the grain produced, as seed (this is usually twice the amount of seed received by the beneficiary). The 'seed' recovered from these farmers is distributed to other farmers in subsequent seasons. It is also expected that through farmer to farmer seed exchange networks, the improved varieties would diffuse to other farmers not covered by the programmes.

NGOs that have implemented such programmes include World Vision, Action Aid, the African Medical Research Foundation (AMREF), CARE Kenya, CRS and Adventist Relief Agricultural programme (ADRA), working

in collaboration with KARI, University of Nairobi, CIMMYT and ICRISAT. Key donor agencies that have funded the programmes include the USAID, FAO and IFAD. It is important, however, to note that the support of donors is not limited to NGOs: they also fund community seed bulking activities implemented by the MOA, which are embedded in its food security programmes such as the Traditional (Orphan) Food Crops Programme in Eastern province, and Njaa Marufuku Kenya (kick hunger out of Kenya).

With the recent calls for a Green Revolution in Africa, focus of donor agencies and NGOs is increasingly diffusing into seed market development, with significant support going towards establishment of seed distribution (agro-dealer) networks in Kenya. These programs generally entail financial support for establishing agro-dealers, training agro-dealers in business and technical aspects of agro-dealership, linking agro-dealers to business financial services and mobilizing agro-dealers to form business associations. Most notable among these is the Agro-dealer Development Programme (ADP) funded by AGRA, which is expanded on in section 5.

It is clear that philanthropic organisations have significantly contributed in shaping the seed industry in general and agro-dealership in particular, in the last two decades. While activities of these organisations have reportedly resulted in increased uptake of improved seeds, fertilisers, and other complementary technologies, and in some cases increased yields, some critics have expressed doubts about the stated results. They view these activities as a 'Trojan horse' for genetically modified (GM) seeds (Waithaka 2008) or simply a strategy to 'roll out a gene revolution' in Africa (Mayet 2009). There is speculation that behind the apparently charitable Green Revolution programmes are profit-driven transnational corporations (TNCs) including Syngenta Crop Protection, Monsanto, Dow AgroSciences, Bayer CropScience and Du Pont Crop Protection, battling for the control of a lucrative seed market in African countries. Hence, the 'charitable' initiatives are seen as a tool for breaking Africa's resistance to GM seeds and foods, and prying open a market for chemical fertilisers. The underlying concern is that GM seeds, fertilisers and other agro-chemicals are potentially

Box 1. Role of agro-dealers in deploying WEMA project

Water-Efficient Maize for Africa (WEMA) is a public-private partnership research initiative that is funded by Bill and Melinda Gates Foundation (BMGF) (AATF 2010). The programme entails use of transgenic materials donated, royalty-free from the Monsanto company, for introduction into local materials. African Agricultural Technology Foundation (AATF) plays the key role of technology broker, negotiating and mediating the relationships between the BMGF, Monsanto and public breeding institutions such as CIMMYT and KARI. Through its stewardship programme, AATF also influences the creation of 'enabling' environment such IPRs and Biosafety regulations that facilitate the field testing and release of the varieties once they are developed. According to Brooks et al. (2009: 29-30)

"...AATF representatives see their flagship 'Strigaway' project as providing the template for the future 'deployment' of the outputs of the WEMA research. In particular they envisage a key role for private agro-dealers in disseminating the technologies and related advice. However, while useful lessons may be learned from the technology-driven introduction of Strigaway technology (a chemical seed coating developed to protect the plant against Striga, or witch weed), these may have limited relevance to a transgenic product several years away from deployment, and for which the development of institutional arrangements are still at a very early stage. Given these complexities, it is questionable whether agro-dealers could substitute for an appropriately trained, agricultural extension service in guiding farmers through a maze of decisions regarding the adoption of the new technologies and their integration into diverse farming systems."

harmful to African indigenous seed populations, biodiversity and the environment. It is also feared that such activities could make smallholder farmers dependent on these costly inputs from TNCs, which will deepen the power imbalances between smallholder farmers and TNCs, represented by the “local” agro-dealers and regional wholesalers’ (Moyo et al. 2009: 15). In Kenya, AATF was using agro-dealers in the delivery of Strigaway maize project as a template for the future deployment of WEMA research (Box 1).

Farmers and their organisations

Farmers and their organisations play several important roles in Kenya’s seed systems. For instance, they participate in research and development of new varieties, mainly through on-farm trials conducted by research organisations. In addition, they act as centres of information dissemination to other farmers regarding new improved varieties coming through research. This is accomplished by way of hosting demonstrations and field days in which the varieties are promoted¹⁸. Farmers (particularly in low rainfall areas) are also involved, individually or as groups, in seed production and distribution, mainly through informal systems, under community seed projects supported by NGOs, research organisations and the MOA (Muhammad et al. 2003). Recently, however, small farmer organisations have slowly started venturing into formal agro-dealership. For instance, some farmer groups in high rainfall areas are running farm input shops (agro-dealers) which they have been trained and facilitated to establish through programmes such as the Kenya Maize Development Programme (KMDP).

There is an umbrella association for Kenyan farmers called the Kenya National Federation of Agricultural Producers (KENFAP), with a membership of 1.43 million farmers, drawn from farmer groups, commodity organisations and cooperative societies. KENFAP has lately been lobbying for farmers’ interests in Kenya’s seed policy. It has recently also been incorporated as a member of the powerful Seed Regulation Committee, which is charged with among other responsibilities, development of seed policy (See Regulation 5(1) of the Seed and Plant Varieties (Seeds) Regulations, 2009). In addition, KENFAP is slowly venturing into agro-dealership – it has established 12 Small Inputs Shops (located mainly in high rainfall areas of Central, Rift Valley and Western Kenya) which stock and sell maize seed and fertilisers (procured in bulk through the organisation) to members as well as non-members. KENFAP has been using these ‘agro-dealers’ to distribute maize seed and fertiliser to farmers under the National Accelerated Agricultural Inputs Access Programme (NAAIAP).

The government, in the SRA intends to support farmer groups to venture into agro-dealership, as a measure to increase farmers’ access to quality farm inputs. In this regard, the policy target is to have ‘farmer organisations carrying out inputs and financial supply operations and rated successful’, and ‘at least 2 farmer apex bodies importing inputs for their members within two years’ of the policy implementation (Republic of Kenya 2004). These measures, if successfully implemented have the

potential of introducing competition in input procurement and distribution, hence reducing input costs for farmers. But few crops have strong national associations which can translate this potential into tangible benefits for smallholder cereal farmers.

This section has shown that the seed system in Kenya is highly complex. In the liberalised system, there are a wide range of interactions. While the state is key in providing core support for breeding as well as a regulatory function, the formal seed system is dominated by market interactions. Through their association, STAK, the seed traders are influenced by a few major companies, including Western Seed, Pannar, AgriSeed, Monsanto and Pioneer, and a parastatal, the Kenya Seed Company (KSC). The companies are reliant on a large network of agro-dealers who distribute and sell seed to farmers. These players are a key link in the chain, and central to broader vision of a private-sector led Green Revolution, supported, coordinated and regulated by the state. In the next section, we present the results of our agro-dealer survey, which puts the Kenyan agro-dealer into a practical perspective, in terms of their main features, how they operate and the operational challenges that limit their effectiveness in delivering a Green Revolution.

4. Agro-dealers in Kenya’s Cereal Seed Systems

4.1. Who is an Agro-dealer?

Defining a Kenyan agro-dealer in practice is quite challenging, yet a good understanding of who an agro-dealer is in local situations and contexts can help in designing better programmes that improve agro-dealer effectiveness and efficiency in input delivery to farmers. According to AGRA (2009a), ‘agro-dealers’ are ‘small farm retailers’ or ‘trained and certified stockists’, through whom farm inputs such as seeds and soil nutrients, and knowledge about their safe and efficient use are channelled to smallholder farmers. In Kenyan farming communities, agro-dealers are defined as ‘traders in agricultural inputs’ (which may include improved seeds, fertilisers, pesticides, animal feeds, veterinary drugs and simple farm tools). Other common names given to agro-dealers are ‘stockists’ and ‘agro-vets’¹⁹.

Seed dealership is anchored in the Seeds and Plant Varieties (Seeds) Regulations, 2009. However, there does not seem to be a specific legal definition of an agro-dealer in Kenya. Persons involved in seed trade have been recognized under different ‘titles’ depending on the piece of legislation. The Seed and Plant Varieties Act (Cap 326) interchangeably refers to seed traders as ‘persons who deal in seeds’²⁰ or ‘sellers of seeds’²¹; and further defines seed selling as bartering, exchanging, and offering or exposing for sale²². On the other hand, the Seeds and Plant Varieties (Seeds) Regulations, 2009 categorize seed handlers into seed merchants, seed growers and seed sellers, with seed sellers being further categorised into agents, sub-agents and stockists. According to Regulation 2 of the Seeds and Plant Varieties (Seeds) Regulations, 2009, a registered seed merchant means ‘a person or firm or institution officially recognized by the Seed Committee

as suitable to procure, process or sell seed'. The Regulations further define a licensed seed seller as 'any person or institution licensed to sell Government tested and certified seeds only'.

Seed sellers ought to be appointed by seed merchants and possess 'knowledge, ability and appropriate facilities to maintain the quality and viability of the seed offered for sale'²³. The procedure for registering as a seed seller can be paraphrased as follows. Each year, seed companies present lists of traders aspiring to become their stockists (who should also have completed an application form for seed sellers' licence) to KEPHIS. KEPHIS then presents the lists to DACs, which discuss the applicants' character and suitability for the business and provide to KEPHIS a list of approved applicants. Thereafter, KEPHIS inspects proposed seed stores of the DAC-approved applicants and issues licences to applicants whose stores are in satisfactory condition²⁴. (Application fees for registration as a seed stockist are Ksh 1,000; while annual licences fees are Ksh 500²⁵).

This registration procedure, however, seems to contradict the tenets of the liberalized environment in which agro-dealership currently operates. The requirement that an applicant for Seed Sellers' Licence be nominated by a particular seed company appears superfluous given that once licensed, the seed seller can trade in seeds of any company.

4.2. Characteristics of Agro-dealers

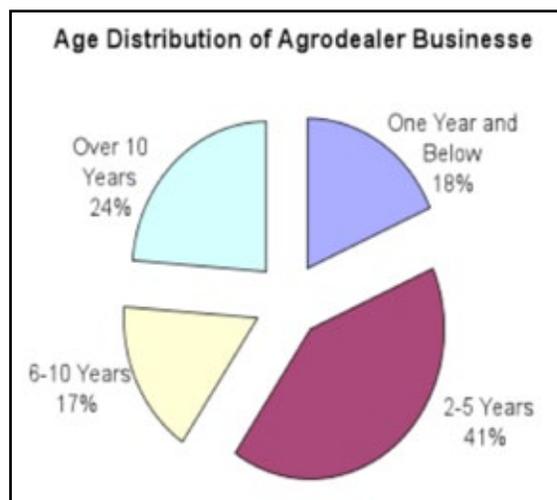
Survey results indicate that about 70 percent of agro-dealers in Machakos and Uasin Gishu are owned by men. The mean age of interviewed agro-dealer owners was 39 years, but agro-dealer owners in Uasin Gishu were much older (43 years) on average, compared to those in Machakos (35 years). Most agro-dealer owners are fairly well educated, with 58 percent having a college or university education. However, only 13 percent have post-secondary school training in an agricultural field. About 20 percent have trained in a pharmaceutical field and 16 percent in an animal health field. Agro-dealer owners in Machakos have a higher level of formal education than

their counterparts in Uasin Gishu, with 71 percent having a college/university education compared to Uasin Gishu's 42 percent. These results are consistent with those of an earlier study by Muhammad et al. (2003) which found seed traders in Eastern Kenya to be mostly male (77 percent), aged about 37 years, well educated (average of 13 years of formal education – which is college level) and some having training in medical (17 percent) and animal health fields (26 percent).

It is worth noting that not all agro-dealer owners are involved in managing their inputs businesses. Survey results show that 44 percent of them managed their businesses on full-time basis²⁶, while 46 percent did so on a part-time basis, and a further 10 percent did not participate in managing the businesses at all. Most agro-dealer owners who did not manage their businesses on a full-time basis had their businesses run by employees. About 67 percent of agro-dealers employed regular workers. The workers were aged 27 years on average and only 40 percent of them had post-secondary education, majority having specialized in pharmaceutical/medical studies and a few in business studies. Overall, about one third of regular workers had received training on some aspects of agro-dealership conducted by agro-chemical and seed companies, KEPHIS, MOA extension staff and some NGOs. However, a regional disparity existed, with about 41 percent of workers in Uasin Gishu and only 25 percent in Machakos having received such training²⁷.

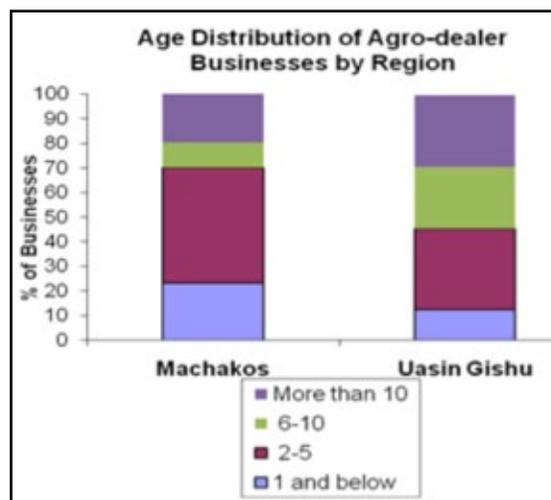
These results imply that although owners of agro-dealers may have high levels of training, their skills may not maximally benefit customers (farmers) since less than a half of them are involved in day-to-day management of their businesses, and are therefore unavailable to field technical queries from customers. This raises an important question regarding who should be targeted by the trainings that have now become popular in agro-dealer capacity building programmes by both public and philanthropic organisations—aimed at making agro-dealer shops as hubs of new technologies and information. Should such trainings target the business owners, most of who are not in regular contact with the customers, or

Figure 4. Age distribution of agro-dealer business



Source: Computed from agro-dealer survey data (2009)

Figure 5. Age distribution of agro-dealer business by region



Source: Computed from agro-dealer survey data (2009)

the employees who run the businesses on daily basis? Further, when we refer to an agro-dealer as 'accredited', who has been trained – is it the person doing the actual selling of seeds and associated inputs, and providing technical information to the farmers on a daily basis?

Most agro-dealer businesses in the study areas are fairly young, with about 60 percent having been in operation for 5 years or less. This matches the findings of Muhammad et al. (2003), who reported the mean age of seed trading businesses in Eastern Kenya to be 5.5 years. However, regional differences exist: more than half of the agro-dealers in Uasin Gishu have been in operation for over 5 years; compared to 30 percent in Machakos. This discrepancy has most likely been occasioned by long presence of seed companies (particularly KSC) in Uasin Gishu, compared to Machakos. Age distribution of interviewed agro-dealers has been illustrated in Figures 4 and 5.

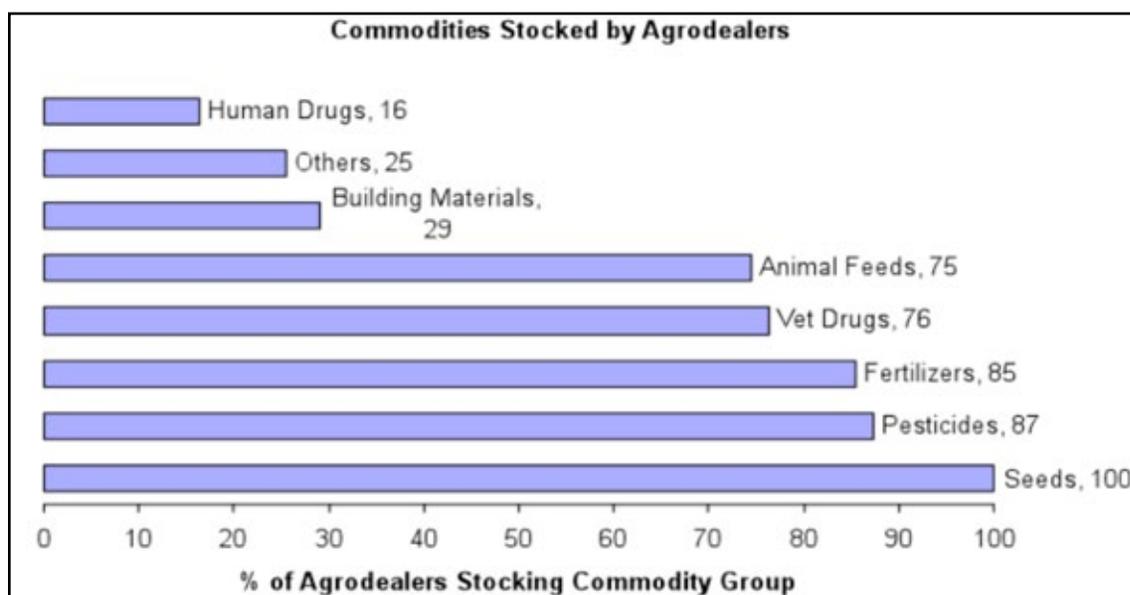
Agro-dealers in Kenya stock a number of commodities. As illustrated in Figures 6, the main items stocked by sampled agro-dealers are seed, pesticides, fertilisers, veterinary drugs and animal feeds respectively. Others commodities include building materials, general merchandise²⁸ (hereafter referred to as others) and human drugs. All agro-dealers had stocked seed in the year 2009, but it is only in Machakos where all agro-dealers had stocked maize seed, compared to 88 percent in Uasin Gishu, as shown in Table 2 In both districts, most agro-dealers stocked seed of horticultural crops, but an

insignificant number also stocked sorghum seed. In Uasin Gishu, a few of agro-dealers also stocked wheat, finger millet and legume seeds. This reinforces earlier arguments that for the food producing sector, formal seed systems serve mainly the high rainfall areas and maize sub-sector.

In terms of money investment, Figure 7 shows that commodities that are not direct agricultural inputs²⁹ constituted more than half of the value of stocks held by agro-dealers interviewed. Seeds and fertilisers constituted a paltry 18 percent of the stock value. A further decomposition of the value of agro-dealer stock by region as shown in Figure 8 shows that about 75 and 43 percent of the stock in Machakos and Uasin Gishu respectively consisted of direct agricultural inputs. This differential between the two regions can be largely explained by their agro-ecological differences In the Eastern Province, it was the beginning of the main rainy season and therefore agro-dealers in Machakos may have adjusted their stocks in anticipation of increased input demand. On the other hand, the main season in Rift Valley was coming to an end and therefore agro-dealers in Uasin Gishu may have divested from agricultural inputs into other commodities due to reduced demand for the inputs.

Diversification of agro-dealer stocks in Kenya has also been reported in earlier fertiliser and seed marketing studies by Wanzala et al. (2001) and Muhammad et al. (2003). The studies show that fertiliser and seed retailers

Figure 6. Commodity stocked by agro-dealers



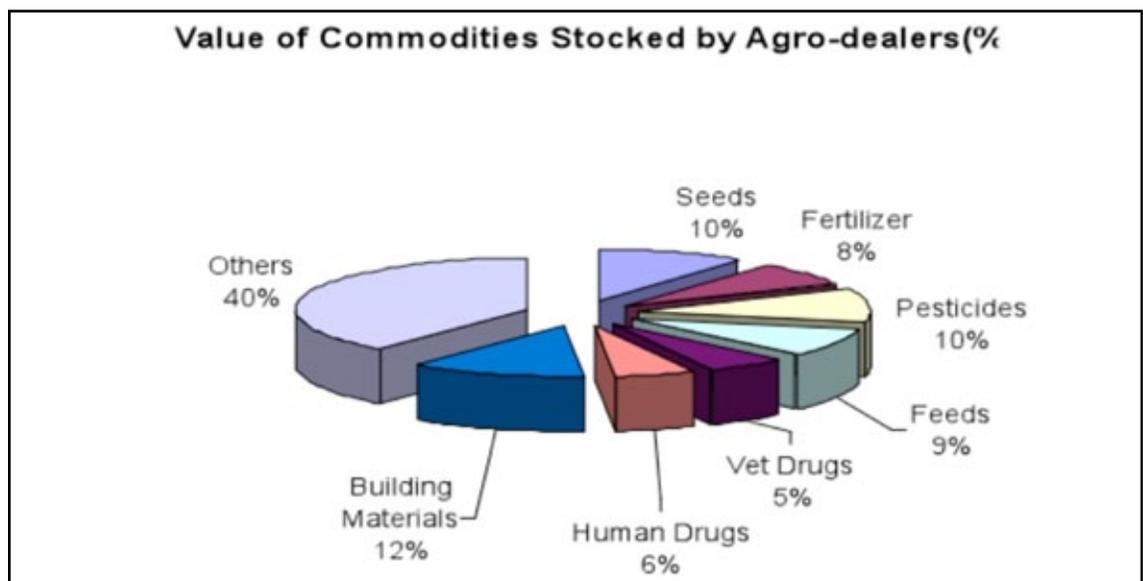
Source: Computed from agro-dealer survey data (2009)

Table 2. Crop focus of agro-dealers by region

District	Percentage of Agro-dealers who Stock Seed of:					
	Maize	Sorghum	Wheat	Millet	Legumes	Vegetables
Machakos	100	3	0	0	0	53
Uasin Gishu	80	12	12	4	36	80
Overall	91	7	5	2	16	65

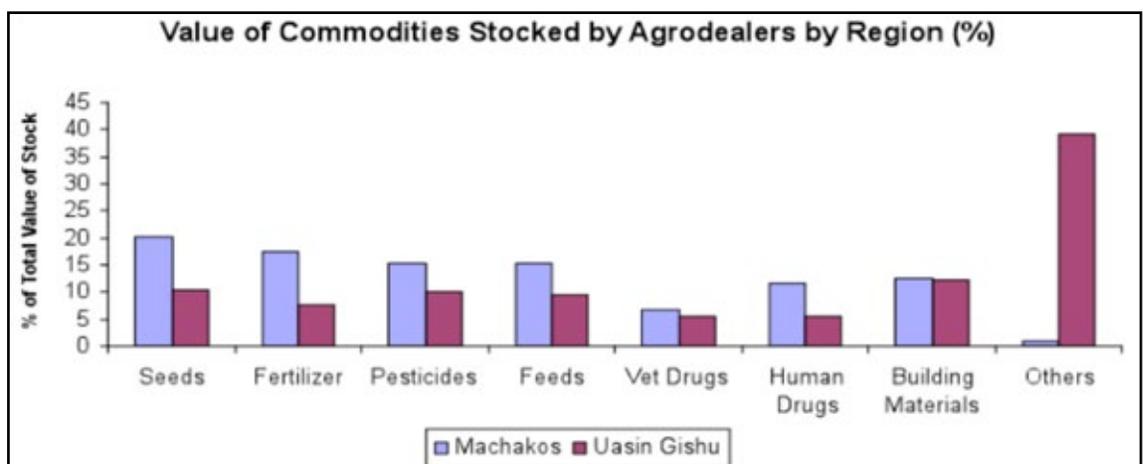
Source: Computed from agro-dealer survey data (2009)

Figure 7. Value of commodities stocked by agro-dealers (%)



Source: Computed from agro-dealer survey data (2009)

Figure 8. Value of commodities stocked by agro-dealers by region (%)



Source: Computed from agro-dealer survey data (2009)

diversify into other agricultural inputs and non-agricultural items. Diversity of commodities stocked reflects a risk coping mechanism for business survival, given the seasonal and erratic demand for agricultural inputs (especially seed and fertilisers). For instance, agro-dealers in Machakos sell cereal seed and fertiliser mainly in September-October (short rains season) and marginally in February-March (long rains seasons), while their counterparts in Uasin Gishu sell cereal seed and fertiliser mostly in January-June (long rains season). The traders hence have to stock other items whose demand is less prone to seasonal fluctuations, in order to keep their businesses afloat when seed and fertiliser business is off-season. Diversification also helps in spreading out business costs such as those associated with transport, handling and storage.

The implication from the results presented in this section is that any initiatives aimed at supporting agro-dealers should not focus only on seed and fertilisers, but the totality of the business stock of other commodities is important in complementing revenue

from commodities related to agriculture and keeping the agro-dealer in business until the onset of the next planting season.

Due to diversity of commodities stocked, agro-dealers in Kenya require many legal documents for a hassle-free operation³⁰. Every formal business ought to be registered with local government authorities (town or municipal council) but further registration with other government agencies depends on specific commodities stocked by agro-dealers. Compliance with agro-dealership registration requirements exhibits a considerable regional discrepancy. Whereas registration with local authorities was more than 95 percent in both regions, the mandatory registration of seed stockists with KEPHIS stood at 88 percent and 47 percent in Uasin Gishu and Machakos respectively. Further, only 67 percent of agro-dealers were registered with Pest Control Products Board (PCPB) in Machakos, compared to 92 percent in Uasin Gishu.

Regulation 18 (5) of the Seeds and Plant Varieties (Seeds) Regulations 2009 states that 'No person shall sell seed unless he holds a valid licence issued under this

Box 1. Role of agro-dealers in deploying WEMA project

Many unlicensed agro-dealers in Machakos District said they had neither heard of KEPHIS nor known that it is mandatory to register seed business with such a body. Phrases like ‘what is KEPHIS?’, ‘what do they do?’, ‘I have never seen them’, ‘I will register if they come around’ were common responses by unregistered seed sellers when asked to show seed sellers’ license from KEPHIS, or why they had not yet obtained the licence. The procedure of formalising most businesses in the region seemed to be one of ‘start-the-business-first, do-the-formalities-later’ (registration in such cases happens when concerned authorities visit business premises during routine/impromptu inspection). Not only do many agro-dealers in Machakos operate without seed sellers’ licences, but some also contravene other laws such as keeping the seed containers intact (seed the photograph below).



This unlicensed agro-dealer in Machakos District sells to a customer maize seed whose package she has tampered with contrary to the law (Condition 5 on the Seed Sellers’ Licence). The agro-dealer owner argued that some of her customers ask for 1kg of maize seed, yet most varieties are sold in 2kg packs. For such customers, she carefully breaks the package in the presence of the customer and removes 1kg of seed, which she packs in another container for the customer. The rest of the seed must remain in the original container for easy identification and acceptance by the next customer who demands 1kg of the same variety. This may be a wake-up call to seed companies to start availing maize seed in packs that are smaller than 2kg in Machakos (a few are already selling some seed in 1kg packs).

On the other hand, in Uasin Gishu, seed stockists take certification by KEPHIS seriously due to a number of reasons. First, strict procedures have to be followed before one can register as an agro-dealer. The DAC vets them thoroughly before they are registered as seed stockists or renew their stockist’s license. In fact, the DAC is so strict on licensing of seed stockists that some years ago, it banned a certain agro-dealer from ever holding a seed seller’s license in the District, after he was caught with adulterated seed.³² Secondly, Kenya Seed Company (KSC), the main supplier of cereal seed to agro-dealers, ensures that the stockists are certified by KEPHIS. An agro-dealer in Burnt Forest Market in Ainabkoi Division, John*, remarked during the survey interview that ‘KSC will not sell seed to you (as an agro-dealer) if you are not certified by KEPHIS’. In the same Market, a local research assistant asked Ms Mary*, an agro-dealer, to show the authors of this paper the ‘KSC license’, to which the KEPHIS license has become synonymous³³. Thirdly, many farmers are aware that seed stockists have to be certified by KEPHIS. David*, an agro-dealer in Jua-Kali Market in Turbo Division, reported that some maize seed customers demand proof of his KEPHIS certification before buying the seed from him.

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A duly registered agro-dealer business in Burnt Forest, Uasin Gishu, displaying documents of formal registration and trainings. The agro-dealer, however, feels that some of the licences are unnecessary. He cites the licence he had to obtain from the Ministry of Public Health, yet he does not deal in food items. He suggests that the authorities should notify traders in advance before introducing new licences.

regulation’. Further, according to Regulation 22 (1) (e) ‘Any person who contravenes any of the requirements of these Regulations, shall be guilty of an offence’. Based on these Regulations, it can be inferred from the survey data that that in reality, there are two types of sellers of certified seed in the country: ‘legal’ (licensed) seed sellers and ‘illegal’ (unlicensed) seed sellers. The fact that there is illegal agro-dealership in Kenya depicts a legal and regulatory framework that restricts entry

by entrepreneurs into formal agro-dealership. It also highlights the lack of institutional capacity among the regulatory agencies charged with enforcing the various agro-dealership laws, a position shared by KEPHIS³¹. Further, having more illegal agro-dealers in Machakos than in Uasin Gishu may be an indication that the regulatory agencies are more active or accessible in the high-rainfall- and marginal areas. It may also be argued that agro-dealers in Uasin Gishu, having been

Table 3. Agro-dealer start-up capital, stock value and asset ownership

District	Start-up Capital (Ksh)	Stock Value During Survey (Ksh)	% of Agro-dealers Owning	
			Business Premises	Motor Vehicle
Uasin Gishu	99,200	387,740	44	24
Machakos	95,625	124,437	17	23
Mean	97,355	234,147	29	24

Source: Computed from agro-dealer survey data (2009)

in operation for a much longer time, had much more time to register their businesses. Box 2 compares the legal status of agro-dealership between low and high rainfall areas.

Table 3 illustrates capital requirement to start an agro-dealer, the value agro-dealer stock and ownership of two assets critical for business recapitalisation – business premises and motor vehicle. The average capital to start agro-dealer business in both regions is about Ksh 100,000. The most important source of this capital in Machakos is own savings, whereas in Uasin Gishu, most of the start up capital is from sale of agricultural produce, since most businessmen are also farmers. During the survey, an average agro-dealer had stock worth Ksh234,000. However, a regional disparity existed, with the value of stock of an Uasin Gishu agro-dealer averaging at Ksh388,000, while that of a similar business in Machakos averaged at Ksh124,000. The implication is that business growth is faster in Uasin Gishu than in Machakos. A study by Omamo and Mose (1999) found that revenues of fertiliser traders in areas with low agricultural potential were significantly lower than those of traders in higher potential areas, due to lower input demand in the low potential areas. This may explain, to a greater extent, the

difference in business growth between the two study areas.

Majority of agro-dealers operate on rented shops as only a paltry 29 percent of study sample owned the business premises they operated in. However, ownership of business premises was more in Uasin Gishu (44 percent) than in Machakos (17 percent). Ownership of motor vehicles and motorbikes by agro-dealers stood at 24 and 11 percent respectively. This low level of ownership of significant business assets has implications on ability of agro-dealers to secure business loans since most lending institutions asked the agro-dealers for a vehicle logbook or proof of business premises ownership as collateral for loans³⁴. It means that most small entrepreneurs are locked out of financial markets, limiting their potential for input business expansion, especially in the low rainfall areas. For instance, Omamo and Mose (1999) reported that 85 percent of fertiliser traders who received credit in 1997 were from high potential areas. In light of these revelations, interventions aimed at increasing agro-dealers' access to credit should pay more attention to the small-scale and young agro-dealers and low rainfall areas, in order to increase agro-dealer density.

To sum up, these characteristics show the heterogeneity of agro-dealers and their operating environment. There are regional variations in terms of age, legal status, size and level of capitalisation of agro-dealer enterprises. Even within the same region, agro-dealers are differentiated by individual characteristics such as owner-operated or manager-operated business, age, gender, level and type of education, etc. As discussed in the next section, these variations have implications in the social, ethnic, and geographical, positioning of agro-dealers, especially in their growth and delivery of agricultural and non-agricultural commodities and services to farmers.

4.3. Maize Seed Agro-dealership: Varieties and Sources

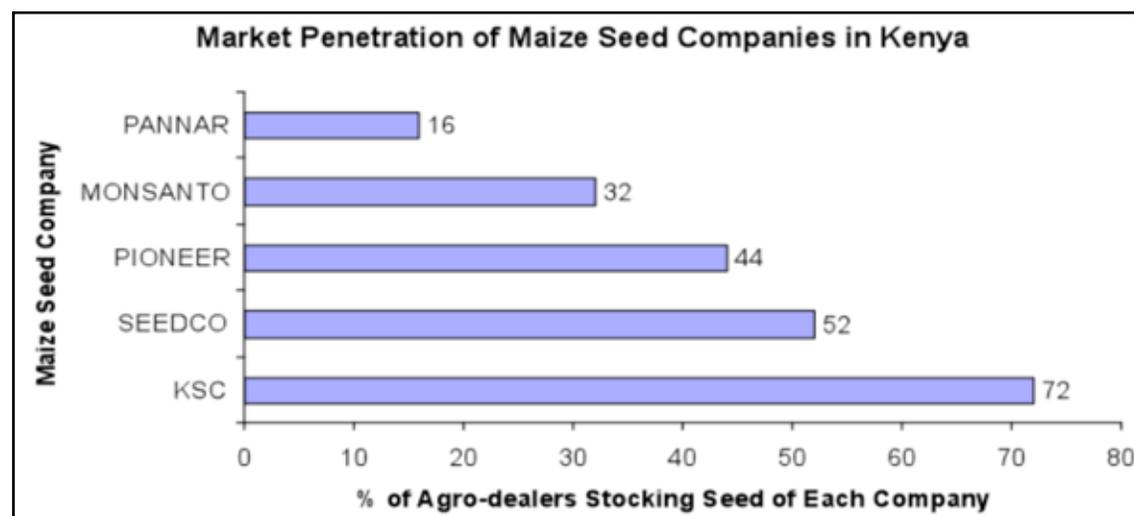
The previous section highlighted the nature of the agro-dealer businesses and their social, ethnic, and geographical, positioning. This section moves on to what they

Table 4. Number of maize seed varieties of each seed company stocked by agro-dealers in 2009

Seed Company	Number of Varieties Stocked by Agro-dealers		
	Machakos	Uasin Gishu	Total
KSC	4	17	20
PANNAR	1	2	3
SEEDCO	2	0	2
PIONEER	1	0	1
MONSANTO	1	0	1
TOTAL	9	19	27

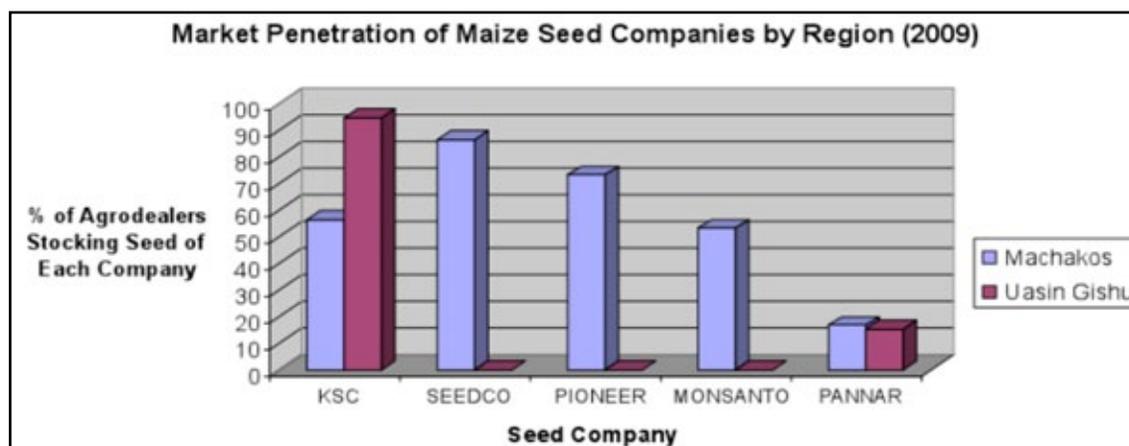
Source: Computed from agro-dealer survey data (2009)

Figure 9. Market penetration of maize seed companies in Kenya



Source: Computed from agro-dealer survey data (2009)

Figure 10. Market penetration of maize seed companies in Kenya by region



Source: Computed from agro-dealer survey data (2009)

actually deliver. The narratives commonly used by government, donors and other Green Revolution advocates promise that the agro-dealers will deliver the type of technologies that farmers (including those in low and medium potential areas) want and need to transform agriculture. By focusing on maize, Kenya's main cereal staple crop, this section examines what varieties and sources are stocked, and the variations that exist.

Survey results indicate that a total of 27 varieties of maize seed were sold by interviewed agro-dealers in 2009 (Table 4). Of these, 19 were traded in Uasin Gishu and only 9 in Machakos³⁵. This difference is not unusual, a recent study Kibaara et al. (2009a) reported that in 2007, 32 maize varieties were planted by farmers in high potential maize zone, compared to 15 in Eastern Lowlands. Maize varieties traded by interviewed agro-dealers were from 5 companies: Kenya Seed Company (KSC), Seed Co., Pioneer Hi-bred, Monsanto and Pannar Seed Company. Interviewed agro-dealers in Machakos stocked seed from all the five companies but in Uasin Gishu, agro-dealers had stocked seed of only 2 companies, namely KSC and Pannar. The average number of varieties stocked by an agro-dealer in Machakos was 4 while agro-dealers in Uasin Gishu stocked an average of 6 varieties. Overall, KSC varieties dominated the market, constituting about 74 percent of the traded varieties.

Figure 9 shows overall market penetration³⁶ of various seed companies in the two regions of study, while Figure 10 compares the companies' market penetration in the two regions in 2009. From these illustrations, it can be noted that KSC again dominated the market, with 72 percent of the interviewed agro-dealers having stocked at least one KSC variety. SeedCo, Pioneer, Monsanto and Pannar had their varieties stocked respectively by 52, 44, 32 and 16 percent of interviewed agro-dealers. However, the market penetration of KSC was higher in Uasin Gishu than in Machakos while the other companies had higher market penetration in the latter than the former.

A possible explanation for the dominance of multinational seed companies in Machakos is that local seed companies have shown little or no interest in certified seed for dryland crops, citing low and erratic demand (FAO 2009). The local companies also lack germplasm adapted to low rainfall areas, since, as seen earlier,

development of maize varieties by researchers in Kenya has for long been biased towards medium and high rainfall areas. Domination of market penetration by KSC in Uasin Gishu can be attributed to several factors including the long presence of the company in the region, which has endeared it to the farmers and agro-dealers and massive promotional campaigns by the company ahead of the planting season. KSC also has exclusive possession of germplasm suitable for high rainfall areas due to an earlier Memorandum of Understanding between KARI and KSC which excluded other companies from accessing varieties released through public breeding programmes for commercialisation (Nyoro and Ariga 2004). Unfair trade practices, such as media reports which accuse some foreign seed companies of dealing in genetically modified maize seeds, result in company disrepute and thus some farmers avoid their seeds³⁷.

Agro-dealers procured their maize seed stocks from two main sources: seed companies and large agro-dealers. Whereas all interviewed agro-dealers in Machakos mainly sourced their seed from large agro-dealers in Machakos town (the headquarters of Machakos District), 61 percent of agro-dealers in Uasin Gishu sourced their seed directly from the seed companies and 39 percent from larger agro-dealers in Eldoret town (the headquarters of Uasin Gishu District).

These differences in seed sources are a main cause of differentials in price stability between the two regions. Retail seed prices in Uasin Gishu ranged from Ksh 230 to 250 per 2Kg pack of KSC varieties and 280-290 per 2Kg pack of multinational company varieties, while in Machakos the prices ranged from Ksh 250-300 per 2Kg pack of KSC varieties and Ksh 350-420 per 2Kg pack of multinational company varieties. In Uasin Gishu, seed prices are less variable across towns, since most of the agro-dealers source their seed from KSC and are given the recommended retail prices. Further, the farmers are also informed of retail prices by KSC ahead of the planting season through the local FM stations³⁸. On the other hand, seed prices in Machakos are very erratic since the small agro-dealers buy from different larger agro-dealers, selling at different prices. The small agro-dealers add their transport costs and margins, making the seed prices to increase. In addition, farmers generally lack information

on retail prices and hence agro-dealers take advantage of the information asymmetry to charge exorbitant prices³⁹. Consequentially, there is a need for seed companies operating in low rainfall areas to strengthen their network of agents and wholesalers in order to reduce distances travelled by smaller agro-dealers to obtain seeds.

4.4. Challenges Facing Agro-dealership in Kenya

Agro-dealers face several challenges in the course of their trade, and this limits their effectiveness in delivering inputs and information to producers and hence the GR in Kenya. The first is a seed industry-wide challenge occasioned by weaknesses in the regulatory framework. For instance, the Seed and Plant Varieties Act (Cap 326) has not been reviewed since the industry was liberalised. It has, in the Draft Seed Policy, been faulted for insufficiently addressing seed certification and testing; regional harmonisation of seed laws, regulations and policies; and review of legal framework. This affects seed trade in general and consequently agro-dealership. Industry players (mostly seed companies and plant breeders, under the umbrellas of STAK and PBAK respectively) have been pressurising the government to review seed laws, and this has placed the Seed and Plant Varieties Act (Cap 326) under review to address the aforementioned and other challenges.

The second challenge is agro-dealers' lack of working capital to adequately stock or expand their businesses. As a result, many agro-dealers are unable to meet farmers' demand at peak of planting season. This supports observations by CNFA/AGMARK⁴⁰ and study findings by Nambiro et al. (2001) that lack of capital was the most important barrier to entering hybrid maize seed retailing in Trans Nzoia, a high maize producing district in Kenya. Ayieko and Tcshirley (2006) posit that due to lack of capital, agro-dealers order less stock, which increases their operational costs and consequently input prices. This limitation was cited by agro-dealers and extension officers as the major challenge in implementation of a NAAIAP in both regions, as discussed later.

The third challenge is high and erratic input prices, especially in Machakos. Muhammad et al. (2003) and Chianu et al. (2008) attributable this to high supply prices and transport and transaction costs, occasioned by long distances to input suppliers and poor infrastructure, especially roads. Due to the price behaviour, agro-dealers at the grassroots find it hard to convince farmers to buy seed from them. Many farmers opt to buy the small quantities of seed they can afford and use non-certified seed to top up their seed demand. Consequently, movement of seed stock is slow and sales are low, limiting business profitability and growth. This, according to Chianu et al. (2008) constrains the development of an efficient agro-dealership.

The fourth challenge is the low and erratic nature of agricultural input demand occasioned by unpredictable weather patterns. This, according to agro-dealers, causes them to lose business opportunities when there is sudden upsurge of demand, and incur losses when inputs

stocks reach their 'sell by' date (particularly agrochemicals, which form an important component of agro-dealers' stock) due to slow movement occasioned by unexpected decline in demand.

The fifth challenge is inadequate supply of inputs at the peak of planting season. Some agro-dealers interviewed argued that when rains set in, there is very high demand for seed by farmers and many traders suddenly start to stock seed. This causes the larger suppliers to run out of stock, yet it takes some time before they can adjust their stocks to match the now high demand.

Other (mild) challenges include government interference with market by providing subsidized inputs (especially fertiliser) at the National Cereals and Produce Board (NCPB) – which sold at about US\$5 less than agro-dealer prices; bad debts due to failure of some farmers to repay for inputs sold to them on credit; and lack of technical information about the seed varieties stocked.

In summary, the mainstream GR narrative for Kenya sees agro-dealers at the centre of the action, and portrays them as the ideal small scale private sector solution to delivering new technologies for Kenya's farmers. However, the survey of two districts – one more high potential and the other lower potential – shows some limitations of this simple narrative. These include:

- the uneven geographical coverage with relatively fewer 'legal' and well capitalised agro-dealers in the poorer, lower potential areas;
- the focus of delivery on a limited number of seeds and varieties (mostly hybrid maize, adapted to medium and high rainfall areas);
- the dominance of a few large companies in the supply chain, with knock on consequences for price competitiveness and technology diversity;
- the limited technical knowledge by those serving in agro-dealerships;
- the restrictive nature of regulations which limits wider competition in the local market; and
- underdeveloped infrastructural support, which increases operating costs and consequently input prices, especially in the low rainfall areas.

Thus the universalising narrative of the role of agro-dealers in the GR, presented by a strong and influential actor network at the centre of agricultural policy making and financing in Kenya can be qualified. The next section looks at a number of specific programmes which put agro-dealers on the centre stage, and examines whether these patterns described above are repeated in the design and implementation of publicly and philanthropically funded programmes aimed at delivering the Green Revolution in Kenya.

5. Driving the Agro-dealer Agenda in Cereal Seed Systems: Select Cases

5.1. Agro-dealers as the Hub of New Green Revolution

The key players at the centre of the actor network promoting the new Green Revolution all see agro-dealers

as central to the delivery system. For instance, in Kenya's Green Revolution policy document, the Strategy for Revitalising Agriculture (SRA), one of the government's policy measures for improving farmers' access to inputs will be to 'assist stockists [agro-dealers] to increase the capacity for inputs supply and the provision of information ...to farmers'. The target was to have stockists providing input services in at least 80 percent of all small towns by 2007.

Similar calls to develop agro-dealers have been made by various individuals and organisations. For instance, during the Africa Fertiliser Summit held in Nigeria from 9-13 June 2006, former IFAD President, Lennart Båge called on various actors to expand agro-dealer networks.

'We [IFAD] see the emergence of a new rural private sector, with agro-dealers starting to provide farmers with inputs... Farmers' physical access to fertilizers is improving, largely due to the growth of agro-input dealer networks across rural Africa. But this work has to be scaled up through collaboration between governments, fertilizer suppliers, NGOs, farmers' organizations and international development agencies.' (IFAD 2006)

In line with the call to scale up, the Alliance for a Green Revolution in Africa (AGRA) has established the Agro-dealer Development Programme (ADP) which is being promoted in Kenya and some other African countries. AGRA assert that 'A strong agro-dealer system is crucial to farmers' success because these local retailers serve as the primary conduits of farm inputs such as seeds and soil nutrients, and knowledge about their safe and efficient use' (AGRA 2009e: para. 2)

Based on the above and other similar narratives, significant investments have gone into building the agro-dealer network in Kenya, through a number of new programmes that have put agro-dealers at the centre of project design. This is seen as part of a broader public good commitment to a GR – part of a public private partnership. Thus about 7.2 million US\$ has been committed by AGRA, for ADP activities in Kenya (AGRA 2009a). The activities include development of national agro-dealer networks and credit guarantees to improve access to agricultural inputs by agro-dealers and small-scale farmers. Further, the government, through the MOA is implementing an inputs access programme, National Acceleration Agricultural Input Access Program (NAAIAP), at an estimated cost of Ksh 16.7 billion (about US\$220 million)⁴¹. The programme involves capacity building for agro-dealers and supply

of subsidised inputs (improved maize seed and fertilisers) through agro-dealers. Another Ksh 1.5 million (about US\$19,350) has been committed by the USAID and American Seed Trade Association (ASTA) through a consortium of research organisations, to implement the Maize Seed for the Poor project (MSP) aimed at determining the most cost-effective way to bring affordable inputs to the poor farmer. This amount covers the cost of subsidised inputs acquired by farmers from local agro-dealers through a voucher system. The following sections examine in detail these three programmes, highlighting the rationale for inclusion of agro-dealers.

5.2. Building Agro-dealer Networks: the Case of AGRA's Agro-Dealer Development Program

Background

Since 2006, the Alliance for a Green Revolution in Africa (AGRA) – a partnership between the Rockefeller and Bill and Melinda Gates Foundations, has been championing agricultural development in Kenya, among other African countries. The main participation of the organisation in cereal seed systems is through its Programme for Africa's Seeds Systems (PASS). The mission of PASS is to increase small-scale farmers' income and reduce poverty through increasing the farmers' yields. It is expected that more than 1,000 new varieties of at least 10 staple crops that increase the productivity of Africa's small-scale farmers and contribute to the alleviation of the hunger and extreme poverty of 30 to 40 million people will be introduced in 10 years, and participating small-scale farmers will be planting improved seeds on 20 to 30 percent of their cultivated lands. (Rockefeller Foundation 2009; AGRA 2009c; 2009e; 2009a)

PASS is implemented under four sub-programmes. Among these is the Agro-Dealer Development Program (ADP), which provides training, capital and credit to establish certified agro-dealers, who are seen as a primary conduit of seeds, fertilisers, and knowledge to smallholder farmers to increase their productivity and incomes (Table 5). Funded to the tune of about US\$7.2 million, the program aims to build and develop networks of certified agro-dealers, to enhance quality, volume and range of seeds sold. The ADP is hoped to result in well-functioning agro-dealers in order to support a significant increase in adoption of improved crop varieties.

ADP activities build on earlier work started by the Rockefeller Foundation in 2001 under its programme titled 'Developing rural agricultural input supply systems

Table 5 Key AGRA-funded agro-dealer development projects in Kenya

Organisation	Project Purpose	Budget (US\$)
Citizens Network for Foreign Affairs, Inc	To develop national agro-dealer networks to improve access to agricultural inputs by small-scale farmers.	4,473,851
Citizens Network for Foreign Affairs, Inc	To continue activities that develops the business and technical capacity of agro-dealers and regional wholesalers.	194,505
Equity Bank Ltd	For a guarantee fund to facilitate access to credit facilities by poor smallholder farmers, agro-dealers and other players in the smallholder farming value chain in Kenya ⁴² .	2,500,000

Source: Compiled from AGRA (2009)

for farmers in Africa'. The programme was informed by a narrative that traced low productivity of smallholder farmers in Africa to lack of access to affordable agricultural inputs occasioned by poorly developed and weakly performing private sector input markets that assumed functions previously performed by the public sector, following economic liberalisation. The narrative underscored the need for a public-private partnership framework in order to raise the awareness about improved technologies and inputs and create a high demand for the inputs; lower the transaction costs of supplying rural areas with agricultural inputs; improve the linkages between importers, wholesalers, and retailers; and improve the economies of scale in marketing of inputs at the wholesale and retail levels.

Based on this narrative, the programme's activities were training of rural stockists on knowledge of fertilisers and seeds, book keeping, costing and pricing, managing business relations, sales and marketing, stock management, and managing working capital. Once completed, these stockists became certified as 'agro-dealers'. This was aimed at enabling the stockists to provide farmers with credible information on agricultural inputs use. The certified agro-dealers would then be linked to major agricultural input supply firms for credit arrangements; pack and sell seeds and fertilisers in small packages; form themselves into 'purchasing groups' and 'agro-dealer associations' which allow them to better negotiate for lower prices and better credit financing arrangements with the agricultural input supply companies, and influ-

ence government policies on imports, pricing, distribution, and marketing of agricultural inputs.

Approach

In Kenya, the ADP is implemented by CNFA/AGMARK in partnership with Equity Bank Ltd, MOA and input supply companies, among others. CNFA/AGMARK began its activities in 2004 under the Rockefeller Foundation-funded programme described above. The activities were implemented on a pilot basis Western Kenya, where use of agricultural productivity enhancing inputs and market penetration of input supply companies were low, despite the area having good rainfall and soils. The programme encouraged input supply companies to venture into this region by absorbing part of the market development costs through sponsoring small field demonstrations with the inputs and organising input fairs in the rural areas, where input suppliers would meet farmers and promote their products. After about 3 years, these efforts led to an influx of input marketing companies into the region and increased demand for modern inputs by smallholder farmers.

In June 2007, CNFA/AGMARK out-scaled its activities and started implementing a 3-year programme known as the Kenya Agro-dealer Strengthening Program (KASP) funded by AGRA under the ADP⁴³. The main activities under KASP include agro-dealer surveys and mapping; agro-dealer training⁴⁴; generating demand for farm inputs through field demonstrations, field days, and agricultural shows; facilitating agro-dealers' access to financial credit for business start-up and stocking⁴⁵; developing agro-dealer output marketing⁴⁶; promotion of farm inputs savings and loan programme amongst smallholder farmers⁴⁷; and facilitating formation of agro-dealers' associations⁴⁸. KASP is implemented in 64 districts in 6 provinces (Nairobi and North Eastern Provinces are excluded).

Preliminary Outcomes

As at January 2010, CNFA/AGMARK had supported establishment of more than 81 new agro-dealers in areas with inadequate agro-dealership and trained 2,166 agro-dealers (Box 3), of which about 1,600 were actively participating in its activities. The organisation had also facilitated agro-dealers to form an umbrella association Kenya National Agro-dealer Association, (KENADA), and was assisting the Association to develop a business plan. In addition, over 20 agro-dealers had been supported to establish output marketing units, an innovative complement to the traditional role of farm input dealership. Through KASP, CNFA/AGMARK expects to establish a network of sustainable agricultural input suppliers serving over 860,000 smallholder farmers by the end of the project's third year⁴⁹.

In summary, implementation of the ADP in Kenya provides some lessons. Although the project is still on-going, and some districts are yet to be covered, preliminary results from the two study districts indicate that more agro-dealers may have so far benefited in high than low rainfall areas, with 48 percent of interviewed agro-dealers having been trained in Uasin Gishu

Box 3. CNFA/AGMARK trained agro-dealer



A CNFA/GMARK-trained agro-dealer in Masii Town, Machakos District displaying his accreditation certificate.

Accreditation of agro-dealers earns them recognition by various seed system actors such as research organisations, MOA, NGOs and financial institutions.

Although this seems to be the beginning point for most agro-dealer support initiatives, most agro-dealers in Machakos are yet to go through the process.

compared to 10 percent in Machakos. Further the trainings seem to have disproportionately benefited the larger (wealthier) agro-dealers, with value of stock (proxy for agro-dealer size) among those trained averaging at about Ksh 600,000 (Ksh640,000 for Uasin Gishu Uasin Gishu and 470,000 for Machakos), compared to Ksh125,000 (Ksh160,000 for Uasin Gishu and 110,000 for Machakos) among those yet to be trained. An area for further investigation is the constraints that limit agro-dealer participation in these trainings, with a view to informing design of future programmes and improving participation particularly of the smaller agro-dealers.

5.3. Putting Agro-dealers to the Test: the Case of Ministry of Agriculture's National Accelerated Agricultural Input Access Programme

Background

In 2006/07, the Government of Kenya formulated the NAAIAP⁵⁰. The programme will initially be implemented in 45 districts over 3 years, at an approximate cost of Ksh 37 billion. The precursor to NAAIAP was the African Union (AU) Special Summit of the Heads of State and Government held in Abuja, Nigeria on 13th June, 2006. During the summit, The African Union Ministers of Agriculture convened for the Africa Fertilizer Summit on 12 June 2006 and made the 'Abuja Declaration on Fertilizer for the African Green Revolution'. The Declaration was anchored on narratives such as:

'Africa needs a Green Revolution which ... constitutes the way of getting African farmers out of the poverty trap by achieving food security and other relevant the Millennium Development Goals.

Africa's farmers face a variety of constraints including low productivity, limited access to new agricultural technologies and weak markets. Without adequate inputs, farmers often cannot meet the food needs of their own families, much less those of a rapidly growing population. To feed themselves and their countries, farmers will need to shift from low yielding, extensive land practices to more intensive, higher-yielding practices, with increased use of improved seeds, fertilizers and irrigation.

...farmers have neither access to nor can they afford the fertilizers needed to add life to their soils. And no region of the world has been able to expand agricultural growth rates, and thus tackle hunger, without increasing fertilizer use.' (IFDC 2010: para. 2 -3)

The Abuja Declaration blamed Africa's food woes on severely depleted soils due to nutrient mining and declared fertiliser a 'strategic commodity without borders'. The Summit declared to accelerate the timely access of farmers to fertilisers, so as to raise its level of use among farmers from the then 8 kilograms per hectare to an average of at least 50 kilograms per hectare by 2015. This would be achieved through several initiatives,

key among them being development and scaling up input dealers' and community-based networks across rural areas; granting targeted fertiliser subsidies, particularly to poor farmers; establishment of financing facilities for input suppliers, with specific attention to women; and improving farmer access to quality seeds, irrigation facilities, extension services, market information.

Based on these international narratives and declarations, the Government of Kenya adopted its own narratives (such as the one below), which culminated in the formulation of NAAIAP:

'...resource-poor farmers do not have the know-how and can not afford the cost of these inputs⁵¹. The consequence is that soils are depleted of nutrients, and farmers obtain low yields. This is the main cause, not only of declining agricultural productivity, but also of increasing food insecurity and abject poverty. ... these farmers are so resource-poor that without external intervention they will never be able to use these inputs. They will remain poor and would not be able to participate in farming as a commercial enterprise. This implies that the country will continue to have a high proportion of its people living below absolute poverty levels and facing food insecurity to the extent that they have to depend on relief food. ...The only way this section of the population can come out of the cycle of poverty and food insecurity is for them to be assisted with agricultural inputs for a given period of time with comprehensive training and capacity-building programmes. (Republic of Kenya 2009)

The primary objective of the programme is to improve input (fertiliser and seeds) access and affordability of key inputs for smallholder farmers to enhance food security/availability at household level and generate incomes from sales of surplus produce. The program aims at improving productivity and output at farm level for 2.37 million smallholder farmers with 1 ha or less of land; by first mobilizing farmers' resources and promoting efficiency in their utilisation and investment in agriculture; and second facilitating access and utilisation of farm inputs for increased production and poverty reduction (Republic of Kenya 2009).

Approach

As outlined in its Design and Implementation Framework (Republic of Kenya 2009), NAAIAP uses a two-pronged approach to achieve its objectives: the Kilimo plus starter kits (inputs grant) and the Kilimo Biashara Package (commercial small packs). The Kilimo plus starter kits targets the very resource poor subsistence farmers in districts with reliable rainfall and owning less than 2.5 acres of land. The farmers are provided with a grant for basic inputs (mainly certified seed and fertiliser) to cover at least 1 acre of maize (this includes 10kg of certified seed, 1bag of a base dressing fertiliser and 1bag of a top-dressing fertiliser). The grants are administered through a voucher system, which enables farmers to get inputs from agro-dealers, trained and accredited for the purpose⁵². After supplying the inputs, agro-dealers then

Table 6. Proportion (%) of land area under main food crops in rift valley and eastern provinces of Kenya (average for 2006-07 Seasons)

Province	Proportion (%) of Land Area under:									
	Maize	Beans	Pigeon Peas	Cow peas	Wheat	Millet	Sorghum	Cassava	Sweet Potatoes	Yams
Rift Valley	58.8	26.0	0.0	0.2	11.3	2.3	1.1	0.2	0.2	0.0
Eastern	38.8	22.1	14.1	10.6	1.1	5.7	6.1	0.8	0.6	0.1

Source: CountryStat (2009)

redeem the vouchers from the government. Target farmers form themselves into groups, which facilitate training and ensure that inputs provided are utilized and part of the produce realized is channelled through the groups' cereal banks for sale to finance inputs for subsequent seasons.

After one season, these farmers are expected to increase production from an average of five 90Kg bags per acre to about 15 bags per acre. Assuming an average family size of 7 persons, 7 bags are adequate for annual consumption while the remaining 8 bags can be sold and ploughed back in form of improved inputs or expanded production⁵³. This way, the resource poor farmers can graduate to next category and participate in Kilimo Biashara. This package targets farmers with better resource endowment and engaged in economically viable enterprises, but lacking basic farming inputs. Through this package, farmers are provided with basic inputs at cost and subsidized credit⁵⁴ from financial institutions and facilitated (in terms of training and technical assistance) to continue with their enterprises.

A Critical Examination of NAAIAP Design, Implementation and Preliminary Outcomes.

The implementation of NAAIAP represents a classical example of a nationwide campaign by the government aimed at helping the resource-poor farmers, in a way that supports agro-dealership. But both the process and outcomes of the program generate mixed views. We critically assess some of the preliminary outcomes of the programme, with a view to identifying how application of a general narrative in design and implementation of such programmes can create wins and losses even for the target beneficiaries.

To begin with, adopting an international narrative that links low productivity to degraded soils and lack of access to modern inputs (specifically fertilisers) and making it the national narrative in Kenya is inappropriate, since it ignores regional differences emanating from agro-ecological and socio-cultural settings in the country. Actors in different regions of the country have different narratives about food production constraints in their regions. During our field work in Machakos District, for example, extension officers cited poor rainfall as the main cause of low food production and hence food insecurity. They also identified low use of modern farm inputs such as certified seeds and fertilisers due to high prices, yet most farmers are poor; lack of access to agricultural credit; degraded soils; and over-reliance on maize at the expense of other drought tolerant crops, as the other main food production constraints⁵⁵. Similarly, farmers cited low and

erratic rainfall as the main challenge, but also mentioned expensive seeds and fertilisers; frequent droughts; lack of basic farming implements (particularly for land preparation and soil and water conservation); and few extension staff as the main causes of low food production and food insecurity in the region⁵⁶.

These arguments complement findings of several studies in the country (for example Owuor 1999; Freeman and Omiti 2003; and Kibaara et al. 2009a) which link low adoption of improved seeds and fertilisers in low rainfall areas mainly to risky farming environment occasioned by rainfall unreliability, as opposed to input accessibility. In such areas, it is argued, inadequate moisture renders yields of most crops unresponsive to fertiliser use and in some cases the fertiliser may even harm the crop by burning it. This limits widespread use of certified seeds and fertilisers.

On the contrary, in Uasin Gishu, a high rainfall district, both the MOA extension staff and farmers were in concurrence that food security is normally not a problem in the area. They were also in agreement that despite the high food production in the district, productivity (particularly of maize) was below the potential⁵⁷. The main constraints to higher yields as identified by extension workers were high cost of farm inputs, particularly fertiliser, diesel and labour; poor farming practices, such as late land preparation, weeding and pest control; and unpredictable weather patterns, particularly onset of rains. Farmers cited low use of improved inputs (particularly fertiliser) due to high prices and poverty among farmers; and late planting as the main constraints to achieving high maize yields⁵⁸.

Secondly, the choice of maize as the only crop to be promoted under the programme seems to negate farmers' preferences, especially in the low rainfall areas. In these areas, agriculture is highly diversified (Table 6), not only as a strategy for mitigating environmental risks, but also because it offers a wide range of choice of crops that meet the dietary needs of the communities. Discussion with senior officials in the MOA identified diversification away from maize as 'the key' to addressing the problem of food insecurity which is common in low rainfall areas. Farmers in Machakos District, especially those with very small farms, complained that they did not plant pigeonpea, a popular legume, because they had devoted all their land to a monocrop of NAAIAP maize contrary to their usual practice⁵⁹. Focusing on maize therefore is again another product of transplanting a high rainfall area preference into the national food security policy. There is need to investigate whether the programme would be more beneficial to farmers

Box 4. Wins and losses: a comparison of NAAIAP outcomes in high and low rainfall areas



Implementation of NAAIAP in Kenya has so far generated mixed outcomes, creating big wins for some and losses for others, and this provides useful lessons for up-scaling the project. For farmers, the possibility and extent of benefits are driven to a large extent by rainfall regime, with huge benefits accruing in high rainfall areas, as illustrated in this story.

Maria*, a smallholder farmer and Secretary of a farmers' group in Uasin Gishu District displays her part of what can be termed a 'bumper harvest' of maize. The farmer had benefited from NAAIAP inputs grant in 2008 season and is now riding on the benefits of the programme to advance her maize farming.

'Before NAAIAP, I used to harvest about 4 bags from my 0.5 acre plot (8bags/acre). After receiving training on how to use fertiliser and other agronomic practices, and receiving the inputs grant, I improved my production to 13 bags (26 bags/acre) from the plot' Maria says. From the harvest, Maria got enough grain for her family's food requirement. She also had surplus grain which she sold and used the money to pay school fees and buy seed and fertiliser for producing the crop she is displaying.

According to Maria, most NAAIAP beneficiaries in her group doubled their maize yields, mainly because they were able to apply both base and top dressing fertilisers as opposed to only one type of fertiliser that they used to apply before NAAIAP. The beneficiaries have also formalized their group and started making money contributions to finance the group's activities. At the time we visited the area, the group had already raised Ksh 75,000 (US\$1,000), with which they intended to construct a greenhouse and start mushroom production. Maria's group is also hoping to start a cereal bank for collective marketing of their grain. They have already signed a contract with the World Food Program (WFP) to supply maize grain this season.

But Maria's counterparts in Machakos were not so lucky. The NAAIAP beneficiaries in Yathui Division in 2007/08 rain season managed to improve their production only in the first season (most farmers doubled their yields by using certified seed, fertiliser and better agronomic practices). However, in the second season (2008/09), there was near total crop failure due to poor rains (which is not a rare phenomenon in the region), and only a few farmers harvested up to 1 bag of maize. Another group of beneficiaries, Kiomo Maize growers in Kangundo Division (now a district) who received the inputs grant in 2008/09 season harvested only up to 4 bags per acre compared to 15-20 bags per acre in a good season. However, the group was happy to have learnt how to use fertiliser and other crop husbandry techniques, adding that they were the only ones who had harvested some grain within their locality that season. The beneficiaries also formed a group, which is engaged in merry-go-round, table banking, giving loans to members, providing labour on each other's farms in turns and buying subsidized fertiliser from the National Cereals and Produce Board (NCPB) in bulk (normally, it would be expensive for a farmer to purchase the fertiliser individually, and it is impossible to buy subsidized fertiliser in very small amounts).

(especially in low rainfall areas) if they have the liberty to choose seed of at least 2-3 key crops.

Thirdly, there was a problem of beneficiary targeting at two levels. At the national level, the districts chosen for the project were those identified as having reliable rainfall or irrigation facilities. This means that farmers and agro-dealers in low rainfall areas would be excluded from the programme. It could also be an indirect concession by the programme designers that the role of agro-dealers in spurring a GR in ASAL of Kenya is insignificant. At the local (District) level, identification of beneficiaries proved to be challenging, especially in higher rainfall areas where poverty levels are generally lower. Due to the short period of time allocated for identification of beneficiaries, Village Elders and Assistant Chiefs played a big role in identifying beneficiaries at community level. This resulted in nepotism, with some non resource-poor farmers benefiting at the expense of deserving resource-poor farmers. However, the problem of beneficiary targeting is not unique to NAAIAP. Similar programmes in the country (such as the Maize Seed for the Poor project implemented by CIMMYT and partners, and the seed fairs and vouchers projects commonly implemented by

CRS) have experienced the challenge of defining who the needy farmers are, and the criteria for selecting the target area and farmers.

Fourthly, the assumption that surplus maize will be harvested in Eastern Kenya is highly questionable because of unreliability of rainfall in most areas. As illustrated in Box 3 below, farmers in Machakos did not even harvest enough maize grain to meet their food requirements in the 2008/09 season. Further, the assumption that poor smallholder farmers will use proceeds from sale of surplus maize grain to buy inputs for subsequent season or to expand their farming business is not guaranteed. This is because many of the farmers, due to poverty and lack of alternative income sources are likely to use the money to meet other priority needs such as school fees and medical expenses.

As for the outcomes, about 21,500 farmers had already benefited from the inputs grant by September 2009, and the target for 2009/2010 season was 170,000 farmers. Further, 1,600 agro-dealers had been trained and certified by CNFA/AGMARK in partnership with NAAIAP, of whom 156 had participated in supplying inputs to farmers⁶⁰. However, due to weaknesses in programme

design and implementation challenges, there were winners and losers. Farmers in high rainfall areas seem to have benefited more from the project as opposed to their counterparts in low rainfall areas, largely due to differences in rainfall patterns between the two regions.

Similarly, agro-dealers in high rainfall areas benefited more than those in low rainfall areas. For instance, more agro-dealers were trained in Uasin Gishu than in Machakos (48 and 10 percent of those interviewed in Uasin Gishu and Machakos respectively). Further, agro-dealer participation in input supply was more in Uasin Gishu (40 percent of those interviewed) than in Machakos (about 3 percent of those interviewed). In both regions, large-scale agro-dealers benefited more than small-scale agro-dealers (at the time of the survey, agro-dealers who had participated in supplying inputs had stock valued about Ksh870,000, while the stock of non-participating agro-dealers averaged about Ksh100,000).

In summary, NAAIAP was designed with the agro-dealer as a hub, but participation of agro-dealers so far in the study districts was both low and skewed. This has been occasioned by a number of factors. First, those who do not meet the minimum qualifications such as registration with relevant authorities are locked out. This affects a bigger proportion of agro-dealers in Machakos where there is a smaller proportion of legal agro-dealers than in Uasin Gishu. Secondly, there is a lack of capacity in terms of working capital or business relationships to secure credit arrangements for purchasing the inputs, and vehicles to transport inputs to farming communities. Again, the constraint is more intense in Machakos where a larger proportion of agro-dealers operate in small-scale. Thirdly, tedious procedures and delays in redemption of vouchers from the government by participating agro-dealers (it took 3-6 months to be repaid after supplying inputs) jeopardises credit arrangements and business relations between agro-dealers and input suppliers/financiers and this discourages some agro-dealers from participating in subsequent seasons, particularly in Machakos⁶¹.

In view of these outcomes, there is a need for the government to identify strategies that will best target the resource poor farmers, with minimal leakages to the non-poor. The program should also find ways of increasing participation of agro-dealers, particularly those operating at a small and medium scale, for instance by allowing them to form partnerships. Further, the government should simplify the process of voucher redemption by devolving it to the districts and/or contracting the redemption function to a private financial institution. The following case study presents efforts by agricultural research organisations in partnership with seed companies, aimed at developing a more effective mechanism for delivering subsidised inputs to poor smallholder farmers.

5.4. In Search of Agro-dealer Friendly Subsidy Programmes: the Case of CIMMYT's Maize Seed for the Poor project Background

The Maize Seed for the Poor (MSP) project was developed in 2008 under the title 'Testing pro-poor market segmentation of maize seed'. MSP is a pilot project which aims at exploring viable market-based mechanisms that would increase poor farmers' access to improved seed and encourage growth of a competitive seed industry. The project is testing different approaches to determine the methods that are most effective in the provision of input subsidies to resource-poor farmers, with minimum leakages to the non-poor; least distortion to the existing marketing system; and without creating dependency. Successful implementation of the MSP is hoped to provide a model for a Kenyan input subsidy programme similar to the one executed in Malawi in 2006 and 2007. (CIMMYT 2009; 2010)

MSP was born out of a stakeholder workshop initiated by CIMMYT, USAID, IFPRI, and STAK, with financial support of American Seed Trade Association (ASTA), held in Nairobi on June 26, 2008. Stakeholders in the initiative were drawn from the seed sector, NGOs, Ministry of Agriculture, agro-dealers and researchers. The project is implemented under a partnership between CIMMYT, KARI, IFPRI and STAK, with financial assistance from the USAID and the ASTA. The following narrative provides the background on which the project was formulated:

Renewed global recognition of the need to enhance global agricultural productivity has placed agricultural science and technology back on the international development agenda. However, thinking has moved from large-scale public investment in productivity enhancement, to find effective ways to transform productivity-enhancing research into deployable products that are profitable to private sector and target the poor. The value of seed traded in East Africa is very small, and there is an urgent need to encourage greater trade and use of improved seed to increase food security. In the last decade, the private sector has greatly contributed to the number of varieties released to the farmers in East Africa. ... While legal frameworks promoting plant breeding do exist, balancing access to protected varieties by vulnerable farmers, while enabling investors in breeding to benefit from their innovation, is critical (De Groote et al. 2008: v-vi).

Approach

The MSP is a form of subsidy that uses a voucher system to deliver improved maize seed to needy farmers. The project uses two classification methods: one in which all farmers of the community are invited to participate (tiered-pricing) and the second, a direct identification system that is designed to target only resource-poor farmers. Direct identification is done by a committee of village elders and other knowledgeable people who create a list of characteristics that define a family as resource-poor. Local households that fit the description are then asked to participate. All participating farmers

are randomly assigned a coupon valued at Ksh 60 or 120. The project is implemented in Embu (Eastern Province) and Kisii (Nyanza Province). More than 5,000 farmers, receiving over 15,000 vouchers participated.

Each farm family has the possibility of receiving two or five of these coupons. The use of multiple coupons is so that farmers can buy different varieties, or buy them at different times. As an experimental control, some farmers receive no coupons at all (these farmers are given either a kilogram of cooking fat or sugar). Participants can use only one coupon per 2 kg bag of seed, regardless of how many coupons they initially receive. The price of 2 kg maize seed pack costs about Ksh 200-400 depending on the variety and the farmers must therefore pay the remaining amount when they take vouchers to accredited agro-dealers (trained by CNFA/AGMARK) to buy the seed. Stockists redeem the vouchers at Equity Bank (where CIMMYT has opened a Ksh 1.5 million account for the project).

Challenges and Preliminary Outcomes

Documented project reports indicate that the project exhibited some challenges, but is also generating good outcomes for both farmers and agro-dealers. Some of the challenges were that farmers did not initially have clear understanding of the working of the voucher system (use of one voucher per seed packet); voucher amounts did not only seem little but they also excluded fertiliser which is a key input that accompanies improved maize seed; the 2kg pack was limiting for poor farmers with very little land and who would require less seed than permissible by the number of vouchers received; the voucher redemption process was slow; and there was improper vetting of the needy farmers – cases of nepotism were reported.

The project is fairly new and its benefits to agro-dealers and farmers are yet to be fully assessed. Nevertheless, initial indications point at some benefits accruing to agro-dealers. Most importantly, participating agro-dealers had their businesses boosted through increased sales, which resulted from increased seed demand from old and new customers, following publicity and provision of input subsidy through the project. The agro-dealers also benefited by linkages to a financier (Equity Bank), with whom they have established good business relationships.

In conclusion, this section has shown the great deal of effort there is towards realizing a Green Revolution in Kenya. This effort is mainly in form of philanthropic programmes that support and involve agro-dealers in the cereal sector, allegedly to accelerate input access and use among poor smallholder farmers. The underlying vision of these programmes is to have a market-based supply system, delivering productivity enhancing inputs to smallholder farmers. Most actors supporting the philanthropic programmes argue that many smallholder farmers in Africa are too poor to participate in markets, thus, leaving them to market forces will only exacerbate inequalities between large and small scale farmers. They hence advocate for public investment in form of smart subsidies like vouchers to 'jumpstart' the system.

However, there seems to be challenges in design and implementation of these programmes, which result in disproportionate wins for larger agro-dealers, and farmers and agro-dealers in high rainfall areas.

The results of these programmes raise two fundamental questions:

- Will the programmes create sustainable input demand and supply systems that will autonomously ensure seed security among poor smallholder farmers or a dependency syndrome which condition smallholder farmers to perennial seed and fertiliser handouts?
- Will agro-dealers really spur a Green Revolution in Kenya, and if so, for which regions, and/or farmers?

The next section summarises this study, while addressing these questions.

6. Conclusion

Owing to the worsening performance of the food producing sector, the government, with backing of development and charitable organisations has been implementing Green Revolution (GR) activities aimed at increasing agricultural productivity and rural incomes. These activities greatly emphasise on increasing farmers' access to and application of high quality modern farming inputs, particularly seeds and fertilisers. In the context of a liberalised economy, input stockists, also known as agro-dealers, are seen to have a crucial role in distributing these inputs to farmers.

Kenyan farmers are highly heterogeneous in terms of agro-ecological, economic and socio-cultural environments in which they operate and their preferred crop enterprises. One is therefore tempted to ask the question: Can agro-dealers deliver the Green Revolution in Kenya; and if so, for which crops, farmers and/or regions? In seeking to answer this question, this paper examined the evolution and characteristics of agro-dealers in the cereals subsector and explored how they command a central position in policy narratives put forward by key actors in the policy arena, each advocating a new GR for Kenya. A number of findings emanate from this study, which are discussed below.

First, both formal and informal seed systems are important channels for delivering cereal seed to Kenyan farmers. The formal systems provide just over 60 percent of the maize seed used in the country, and is delivered mainly through agro-dealers. However, the systems mostly serve farmers in high rainfall areas located in the greater Western and Central regions of the country. On the other hand, informal systems (which do not involve agro-dealers) provide just fewer than 40 percent of maize seeds and well over 65 percent of the seeds of other cereals. The informal system is the main source of seeds for farmers in low rainfall and marginal areas, located mainly in the greater Eastern region of the country. Notwithstanding the importance of the informal systems, the legal, regulatory and policy frameworks, which are anchored on international seed policies and conventions (which have a largely commercial orientation), favour the formal systems. Based on this finding, it may be argued that in the foreseeable future, agro-dealers may

only spur a GR mainly for maize farmers and in high rainfall areas.

Second, a strong core coalition of actors exists in the seed sector in Kenya, focused on the entire seed value chain. These include the Ministry of Agriculture, research institutions, seed companies and their network of agro-dealers, donor and philanthropic organisations and farmers. The informal seed systems are dominated by the government and donor/non-governmental organisations. On the other hand, the formal seed system is dominated by a few major private companies and a parastatal, the Kenya Seed Company (KSC), and their agro-dealer networks. However, there are barriers preventing new actors from entering the seed business. The policy and business environment favours KSC over other companies and exhibits excessive government interference. This seemingly contradicts the government's intention of promoting private sector investment in the seed industry.

Actors in the seed industry employ different approaches in their activities, depending on geographical region, but due to different politics and interests at play, there seems to be convergence on the role of the agro-dealer as the primary carrier of improved seeds to farmers. In the greater Western and Central regions of Kenya, the actors centre mainly on certified seed and fertiliser market development which entails development of agro-dealer networks. On the other hand, in the greater Eastern Kenya, private sector activity is limited. The government and donor/non-governmental organisations focus their activities on seed aid and informal seed systems to fill the void created by the private sector. But the seed aid is also slowly moving towards 'market-based' approaches such as seed fairs and vouchers, which involve support for and active participation of agro-dealers. Interestingly, while the actors promote the agro-dealer agenda, they also support parallel activities that seem to undermine development of agro-dealership. These actions may be interpreted as low confidence in agro-dealers among the state and philanthropic organisations. The justification for this situation is that since the private sector is driven by profits, it will hence concentrate on seed of crops and regions for which demand is sufficient enough to attract investment in agro-dealership. The high farming risk in low rainfall and marginal areas severely constrains growth in demand for certified seed. In the low rainfall and marginal areas, distribution of improved seed is likely to be dominated by public and humanitarian organisations. Therefore, if agro-dealers are to spur a GR in Kenya, it will be mainly in the high rainfall areas.

Third, Kenyan agro-dealer owners (popularly known as 'stockists' or 'Agro-vets') are fairly young, well educated mostly male entrepreneurs dealing in seeds, pesticides, fertilisers, veterinary drugs, animal feeds, building materials, general merchandise and human drugs. Diversity of commodities stocked reflects a risk coping mechanism for business survival, given the seasonal and erratic demand for agricultural inputs, and also helps in spreading out business costs such as those associated with transport, handling and storage. Therefore, any initiatives aimed at supporting agro-dealers should not

focus only on seed and fertilisers, but the totality of the business. Another important finding is that less than a half of agro-dealer owners are involved in day-to-day management of their businesses, and are therefore unavailable to field technical queries from customers. If agro-dealers are to deliver a GR in Kenya, the trainings in agro-dealer capacity building programmes should not target only the business owners: the 'managers' should also be targeted, especially with respect to the technical modules. Agro-dealers face several challenges, which limit their effectiveness in delivering inputs and information to producers and hence the GR in Kenya. The key ones are weaknesses in the regulatory framework, lack of working capital, high and erratic supply prices, low and erratic demand for modern inputs and inadequate supply of inputs at the peak of planting season.

Fourth, significant investments have gone into building the agro-dealer network in Kenya, through a number of new programmes that have put agro-dealers at the centre of project design. These programmes are based on narratives that link low agricultural productivity to farmers' lack of access to modern inputs (specifically fertilisers and seeds). The actors implementing these programmes see an increase in agro-dealer density as key to increasing accessibility of inputs and therefore have undertaken building agro-dealer networks in rural areas. There seems to be a general consensus among various actors that because poor farmers are unable to effectively participate in input markets, there is need to provide them with subsidised inputs in order to stimulate demand for the inputs. However, the actors are in favour of market-friendly approaches, which promote agro-dealership and condition farmers for input markets. Universalising of agro-dealer narrative in the programmes overlooks the heterogeneity of the 'poor smallholder farmers' and agro-dealers. This has resulted in enormous challenge of beneficiary targeting and disproportionate wins for farmers and agro-dealers in high rainfall areas and large agro-dealers. Greater attention must be paid to meeting the needs of farmers in lower potential areas (who represent the vast majority of Kenya's agricultural producers) by developing innovative alternative business models beyond the archetypal agro-dealer establishment, which focuses on a single entrepreneur capable of running a profitable business from the sale of agricultural inputs to a customer base which is willing and able to afford them. Such models would focus on the sale of complementary non-agricultural products or services with agricultural inputs to create a successful business or the establishment of group-based agro-dealerships – e.g. for farmers' organisations, women's groups or youth groups – which might operate part-time or on a not-for-profit basis as a service to their community. Alternatively, mobile agro-dealers might provide regular or periodic services to more remote areas than cannot sustain permanent agro-dealerships (possibly coming on market days when large numbers of people gather together). In short, efforts must be made to move away from the 'one-size-fits-all' agro-dealer model as it is currently construed.

Finally, notwithstanding their (potential and actual) benefits, the Green Revolution programmes have been viewed by critics as a 'Trojan horse' for genetically modified (GM) seeds or simply a strategy to 'roll out a gene revolution' in Africa. Such critics have a premonition that behind the actors championing the apparently charitable Green Revolution programmes are profit-driven transnational corporations (TNCs), battling for the control of a lucrative seed market in African countries. These programmes are seen as a tool for opening a market for GM seeds and chemical fertilisers, substances feared to be potentially harmful to African indigenous seed populations, biodiversity and the environment, in addition to making smallholder farmers dependent on these costly inputs. As illustrated in this study, AATF is, for example, using agro-dealers in the delivery of Strigaway maize technology as a test-case for deploying new GM seeds from the WEMA project. But the extent to which agro-dealers have capacity for local-level implementation of biosafety regulations has yet to be determined and is therefore an area requiring further research⁶².

Kenya in many ways is the 'poster child' for the New Green Revolution in Africa, with its public-private alliance attempting to establish local, rural entrepreneurship. A range of initiatives build on a strong private seed sector and a well developed and extensive network of small-scale agro-dealers. In reality, the agro-dealers are spread unevenly throughout Kenya, inevitably concentrated in the higher potential agricultural areas in the centre and west of the country. Although they are provided with a range of support, including training in business management through NGOs, they must rely on a diverse commercial base, offering a range of non-agricultural products to create a successful business. Making a business out of selling seeds and fertilisers is risky, and especially so in the dryland areas where demand is low and variable. Therefore, links with particular seed companies is essential and central to these enterprises. The changing structure of the Kenya seed industry (dominated by the parastatal Kenya Seed Company, but involving numerous other private seed companies) and the entry of large multinational players is changing this dynamic. This acts to narrow the choice of seeds and crop types to farmers in all areas. With the Biosafety Bill recently approved and the appointment of officers of a new National Biosafety Authority, the prospect of GM crops being pushed through agribusiness networks is a major emerging issue, with questions as to whether agrodealers have the capacity to provide local regulatory control of new seeds. Farmers' own informal seed systems must operate in parallel, and particularly poorer farmers in more marginal areas must rely on informal systems as their primary source of seed.

Appendix 1:

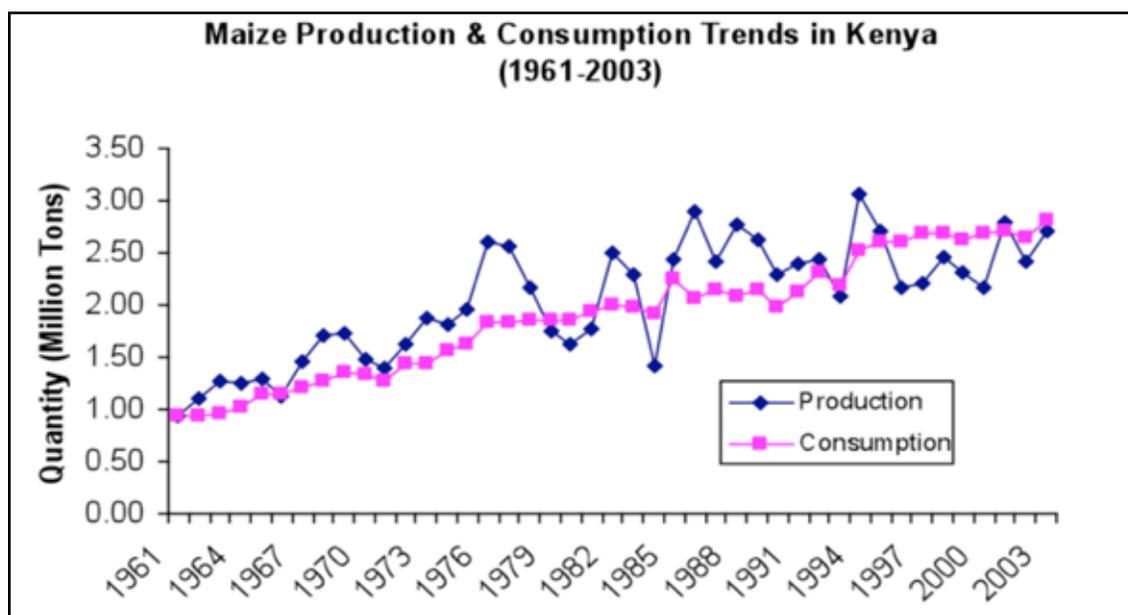
Aggregate cereal production and yield trends in Kenya (1987-2005)

	1987	1990	1993	1996	1999	2002	2005
Production (Million tonnes)	3.1	2.7	2.5	2.6	2.8	3.0	3.5
Yield (Tonness/ha)	1.6	1.6	1.5	1.4	1.4	1.5	1.6

Source: Computed from FAOSTAT data

Appendix 2:

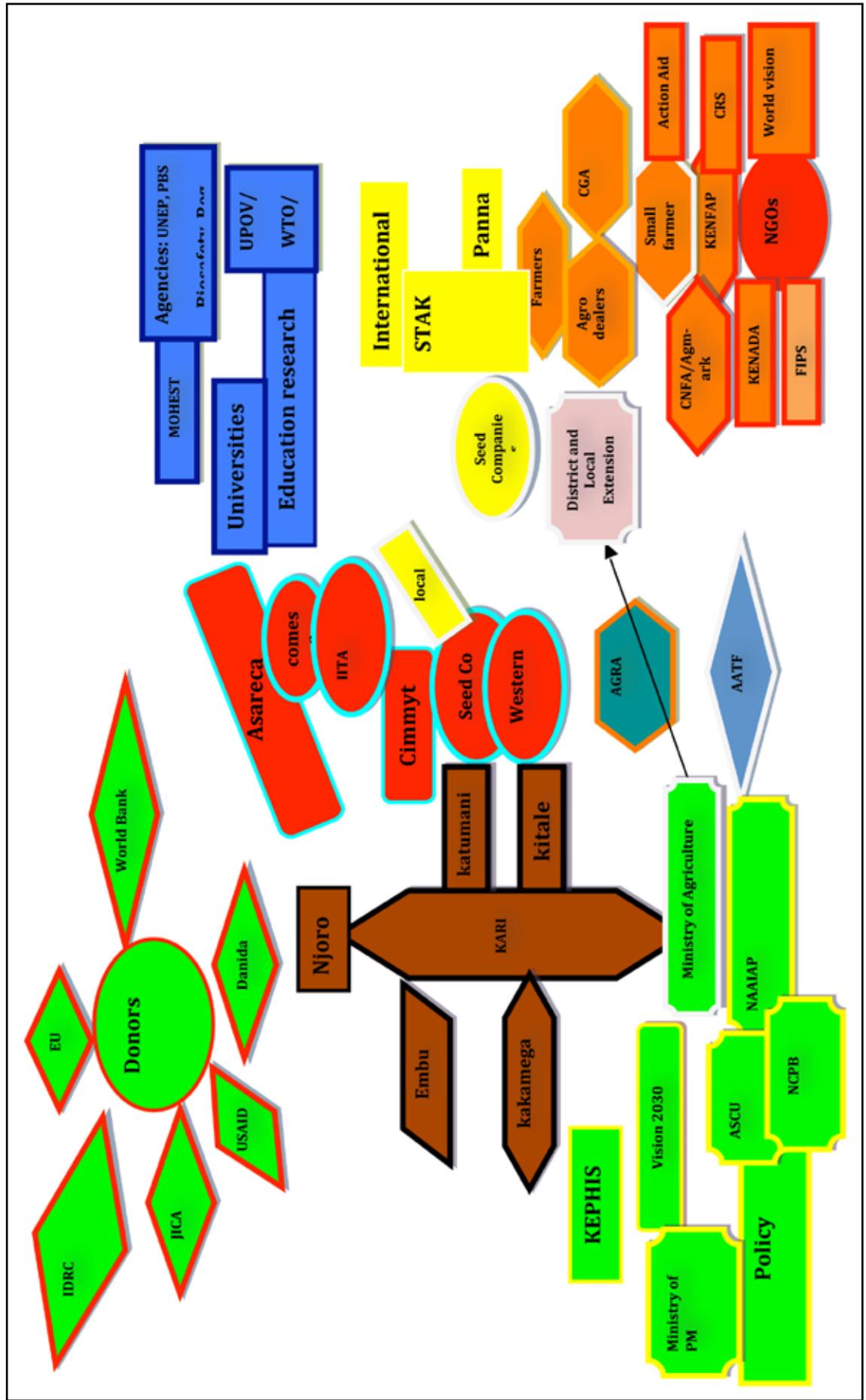
Maize production and consumption trends in Kenya (1961-2003)



Source: Created from FAOSTAT data

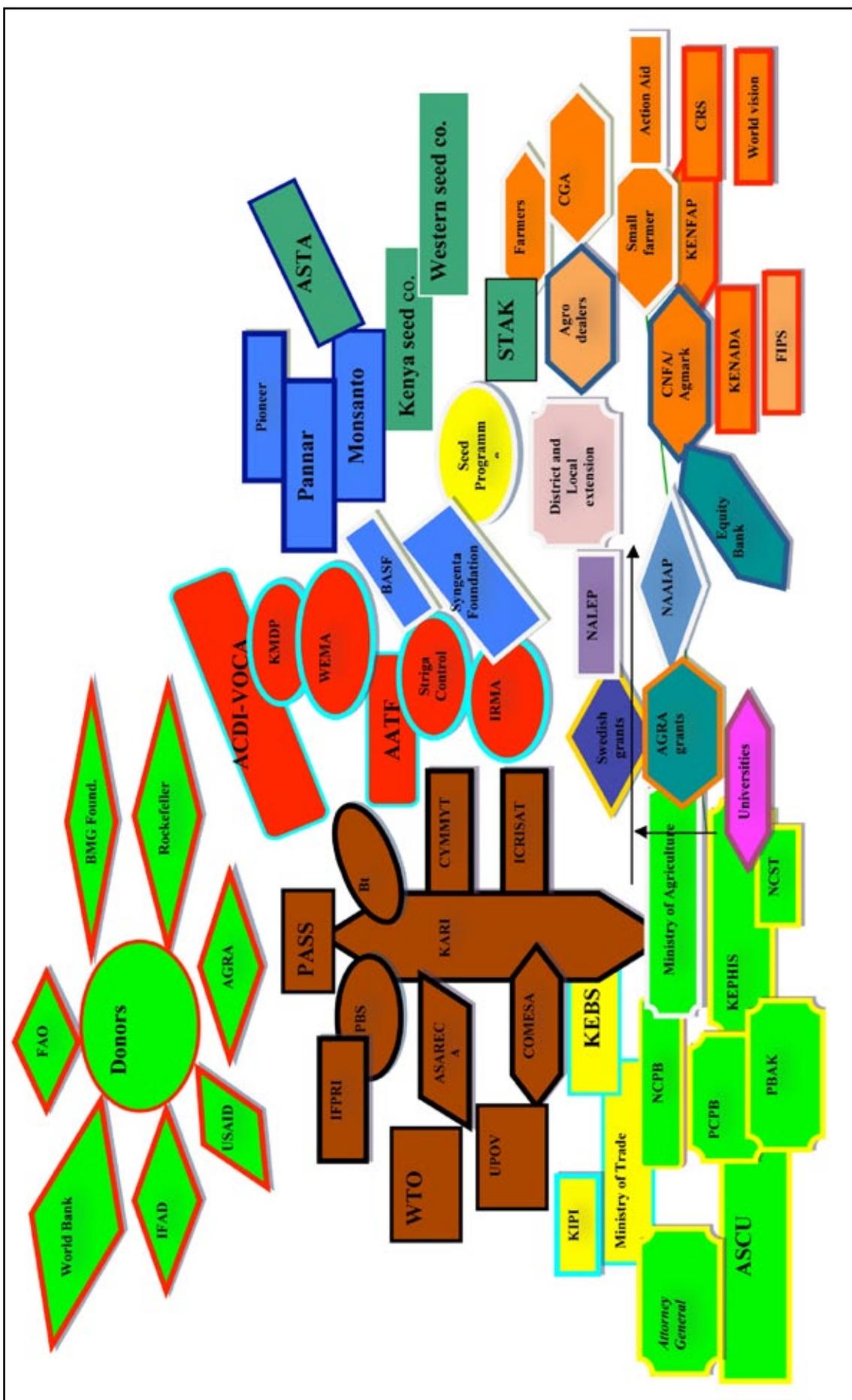
Appendix 3:

Actor-network map: before fieldwork



Appendix 4:

Actor-network map: after fieldwork



End Notes

¹ http://www.safaricomfoundation.org/fileadmin/template/main/downloads/Kenya_VISION_2030-final_report-October_2007.pdf (accessed 31 July 2010)

² From estimates by Kenya Maize Development Programme (KMDP) and FAOSTAT average for 2004-07.

³ Aggregate cereal data considered in this section are for Maize, Sorghum, Millet, Wheat and Rice.

⁴ Districts as constituted in 2006 before the recent sub-divisions. Uasin Gishu a traditional 'breadbasket' district has a total of 327,000ha of agricultural land, all of which is classified as high potential, while Machakos has a total of 1,350,000ha of agricultural land, of which about 9 percent is high potential, 57 percent is medium potential and 34 percent is low potential (Republic of Kenya 2008a). Of the 55 agro-dealers interviewed, 30 were from Machakos and 25 from Uasin Gishu.

⁵ Source: Remarks by Hon. Uhuru Kenyatta, Deputy prime minister and minister for finance during the signing ceremony for the Kenya Agricultural Productivity and Agribusiness Project loan Agreement between the World Bank and the government of Kenya On 6th July 2009.

⁶ GRASP is a net network of civil society organisations Africa, Europe and North America, advocating for the interests of small agricultural producers in Africa.

⁷ The main references for this section are Bay 1998; van der Burg 1998; TechnoServe-Kenya 2000; Tripp 2001; CRS, ICRISAT and ODI 2002; Muhammad et al. 2003; and Smale and Jayne 2004. Additional information also came from discussions with government officials in the Ministry of Agriculture and KEPHIS; Kenya National Federation of Agricultural Producers, KENFAP; and field observations in Machakos and Uasin Gishu. Several websites were also visited and have been referenced.

⁸ Kenya has 5 other Provinces: Nairobi, Nyanza, Coast, North Eastern and Eastern.

⁹ Interview: Ms. Anne Onyango, Policy Director, Ministry of Agriculture.

¹⁰ Appendix 3 shows an imagined map of actor-networks in Kenya's cereal seed systems –that was prepared before fieldwork. This mental map was intended to help us identify key actors and review their general roles and relations in the country's cereal seed systems. The map of the actual actor-networks that are influencing the agro-dealer agenda in Kenya, as revealed by the pilot study findings, is shown in Appendix 4.

¹¹ KEPHIS is a State Corporation established in October 1996, following liberalisation of the seed industry. KEPHIS offers the following key services to the industry: administration of Plant Breeders' Rights; National Performance Trials for variety release and commercialisation; registration of seed merchants and seed growers; licensing of seed sellers, seed inspections and testing; and farmer advisory services (KEPHIS Service Charter).

¹² A DAC performs several regulatory functions in the agricultural sector at the district level on behalf of the MOA. It is chaired by the District Commissioner (DC), while the District Agricultural Officer (DAO) is the Secretary. Farmers are also represented in the DAC (See Agriculture Act, Cap 318).

¹³ For example, in the September-October 2010 planting season in Eastern Kenya, the government was

supplying subsidized fertiliser to farmers through the NCPB and directly distributing free seed to 'resource poor farmers' using Government trucks and staff (provincial administrators and MOA extension staff). The MOA was also implementing the National Accelerated Agricultural Inputs Access Programme (NAAIAP), a fully subsidized voucher-based seed (maize) and fertiliser distribution programme that entailed agro-dealer support and participation as highlighted in section 5.

¹⁴ ASARECA member countries are Burundi, Democratic Republic of Congo, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, Sudan, Tanzania, and Uganda.

¹⁵ CAADP's Pillar 4 is: Improving agriculture research, technology dissemination and adoption.

¹⁶ See AFSTA website: www.afsta.org. STAK also hosts the AFSTA Secretariat.

¹⁷ KSU is a public seed enterprise under KARI that produces and markets commercial seed of dryland crops.

¹⁸ Several actors sponsor field demonstrations and field days. These include research organisations, MOA, NGOs (such as ACDI/VOCA, FIPS Africa and CNFA/AGMARK), seed companies and agro-dealers. CNFA (Citizens Network for Foreign Affairs) Inc. is a global NGO based in Washington DC., while AGMARK (Agricultural Market Development Trust) is a Kenyan non profit-making organisation and local affiliate of CNFA. CNFA/AGMARK focuses on the commercial private sector provision of goods and services and creates linkages between actors in farm input supply chain and public sector services (see www.cnfa.org).

Additional information in this section came from discussions with S. Collins (Country Director, Kenya) and S. Guantai (Marketing and Communications Coordinator), ACDI/VOCA; and S. Ngwalla (Director, Business Training and Output Marketing), CNFA/AGMARK.

¹⁹ From interviews with Ministry of Agriculture Extension staff in Machakos and Uasin Gishu Districts

²⁰ Article 3 (3) (f), (g)

²¹ Article 4 (4)

²² Article 2

²³ Regulation 18 (1)

²⁴ From discussion with Dr. Ahenda of KEPHIS.

²⁵ Part E of the Seed and Plant Varieties (Seeds) Regulations, 2009. US\$ 1 = approximately Ksh 76

²⁶ Managing/running business refers mainly to direct involvement in serving customers.

²⁷ Agro-dealer trainings are mainly conducted by agro-chemical and seed companies, KEPHIS, Ministry of Agriculture extension staff and (more recently) some NGOs.

²⁸ This includes items such as general foodstuffs, soaps and detergents, home appliances, utensils and skin care products, among others.

²⁹ Agricultural here connotes crop and livestock.

³⁰ As many as 10 licenses may be required, according to S. Ngwalla of CNFA/AGMARK.

³¹ Interview: Dr. Ahenda, KEPHIS.

³² According to DAO, Eldoret East District (created recently from Uasin Gishu).

³³ Before KEPHIS was established, most seed stockists operated under a license from KSC, then a monopoly.

³⁴ Out of the 8 agro-dealers in the sample who had

received loans from financial institutions, 4 had used motor vehicles as collateral, while 1 had used his business premises to secure the loan.

³⁵ Maize seed varieties traded in Uasin Gishu were H511, H513, H515, H516, H520, H612, H613, H614, H624, H626, H627, H628, H629, H6210, H6212, H6213, H9401 (all from KSC) and PAN 691, PAN 67 (both from Pannar), while Maize seed varieties traded in Machakos were DH01, DH02, DH04, H513 (all from KSC); Duma 41, Duma 43 (both from SeedCo), DK 8031 (from Monsanto), PHB 3253 (from Pioneer) and PAN 4M19 (from Pannar). Some agro-dealers in Uasin Gishu, where a high number of varieties were traded seemed to have forgotten a few of the varieties they had traded in, meaning that more varieties than reported here could have been traded.

³⁶ Market penetration here is represented by percentage of interviewed agro-dealers who stocked seeds of a particular seed company in 2009, regardless of the number of varieties or quantities of seeds sold.

³⁷ Discussion with Ministry of Agriculture Extension Staff in Uasin Gishu.

³⁸ Information source: Agro-dealer survey data and discussions with farmers in Uasin Gishu.

³⁹ Information source: Agro-dealer survey data and discussions with farmers in Machakos.

⁴⁰ Discussion with Mr. S. Ngwalla, CNFA/AGMARK.

⁴¹ Source: Interview with NAAIAP Program Coordinator; and NAAIAP Programme Design and Implementation Framework 2009/2010.

⁴² This project is implemented in partnership with IFAD (see www.agra-alliance.org/content/news/detail/822).

⁴³ By this time, the Rockefeller Foundation had already partnered with Bill and Melinda Gates Foundation to form AGRA, through which it was channelling support for some of its African programmes.

⁴⁴ This covers the six business modules already discussed under the initial Rockefeller-funded programme plus two technical modules, all offered at a total subsidized cost of Ksh 3,000 (about US\$40).

⁴⁵ These include Matching Grants for agro-dealer start-ups, in which CNFA/AGMARK and the agro-dealer contribute 50 percent of the start-up capital each; credit guarantees of 50 percent by CNFA/AGMARK to input supply companies for inputs supplied to certified agro-dealers; and certification of agro-dealers, which qualifies them for business loans at Equity Bank.

⁴⁶ Under this initiative, agro-dealers are provided with Matching Grants to start up farm output marketing activities. These activities include buying and selling farm output and value addition. As examples, some agrodealer have been linked to the World Food Programme, WFP, and facilitated to buy food grain from smallholder farmers to bulk it for the organisation; while others have been facilitated to set up small-scale maize milling businesses.

⁴⁷ In this programme, some farmer groups (for example in dry areas of Eastern Kenya) save Ksh 10 per member per day. At the end of every week, the group collects the saved money and deposits it with an accredited agrodealer. At the end of the year, each farmer will have saved about Ksh 3,650 (which can purchase improved seed and fertiliser for about 0.5 acres of maize), which is redeemed from the agro-dealer in form of inputs at

planting time.

⁴⁸ The associations are formed at district and national levels. The associations are expected to bring selfregulation

among agro-dealers, reducing cases of trade in 'fake' inputs. Further, the associations will lobby the government for favourable business policies. A key lobby issue will be pressurising the government to stop direct seed distribution, which is seen as a threat to agro-dealership.

⁴⁹ See www.cnfa.org/kasp for more project achievements.

⁵⁰ From discussion with Mr. Makheta, Program Coordinator, NAAIAP.

⁵¹ Inputs referred to here are fertilisers and certified seeds.

⁵² For accreditation, stockists must have been in inputs business for one year; be registered with registrar of societies; certified by KEPHIS and PCPB; Kenya Revenue Authority (KRA) compliant, certified by CNFA/AGMARK, and recommended by their respective DACs.

⁵³ Discussion with NAAIAP Coordinator, Mr. P. Makheta.

⁵⁴ Farmers can access this facility through Equity Bank at 10 percent interest rate, which is lower than average commercial lending rates. The credit is in form of inputs acquired from CNFA/AGMARK certified agrodealers. The agro-dealers later claim from Equity the money for inputs supplied to farmers.

⁵⁵ Discussion with extension officers in all the 8 new districts curved out of the larger Machakos District.

⁵⁶ Discussion with members of Kiomo Maize Growers group in Kangundo District, and a group of NAAIAP beneficiaries in Mwala District. (Both districts have been curved out of the larger Machakos)

⁵⁷ Extension officers estimated the current yields of maize to range between 15-30 90-kg bags per acre, depending on the agro-ecological zone, while the potential is about 30-35 90-kg bags per acre.

⁵⁸ Discussion with Maria (not her real name), Secretary of a farmers' group in Uasin Gishu.

⁵⁹ Discussion with Kiomo Maize Growers group of Kangundo District

⁶⁰ According the Program Coordinator, Mr. Makheta

⁶¹ In Machakos, most agro-dealers who participated in NAAIAP in 2008 declined to participate in 2009 and the district had to engage large agro-dealers from outside the district (such as Nairobi) to supply inputs.

⁶² Phase II of this study explore the capacity of Kenyan agro-dealers to implement national biosafety regulations.

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