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Tegemeo Institute of Agricultural Policy and Development



Egerton University

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AGRICULTURAL EXTENSION IN KENYA: PRACTICE AND POLICY LESSONS

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Abstract

A consensus exists that extension services, if functioning effectively, improve agricultural productivity through providing farmers with information that helps them to optimize their use of limited resources. Variations in management practices and husbandry skills among small farmers in Kenya are very wide. Tremendous poverty-reducing benefits could be reaped by bringing the unit production costs of the most inefficient farmers to mean levels. Achieving these gains in agricultural production efficiency will depend on many factors, but extension is likely to be among the most important. Therefore, the costs to the nation of having an under-performing extension service – in terms of smallholder productivity, incomes, and poverty reduction, and the ability to survive or even thrive after the reduction in import tariffs as implied by impending COMESA and EAC trade agreements – are very high. The objective of this study is to assess the range of alternative food crop and livestock extension services currently operating in Kenya. The report is primarily descriptive, providing knowledge on the nature of the existing extension providers, their characteristics, approaches employed and the challenges they face. Based on successful cases, we identify attributes that may be important for future discussions about extension service provision in Kenya and the role of the government in such a scenario. The study covered 16 districts representing the various agro-regional zones present in Kenya. It employed qualitative methods and focused on private and public extension service providers. Discussions were also held with other stakeholders in the agricultural extension service realm about their experiences and perceptions of the existing extension systems and approaches.

The study highlights five important findings: (1) private extension provision is generally skewed towards high agricultural potential regions and high-value crops. Remote areas and poor producers, especially those growing low-value crops with little marketable surplus, are poorly served. Non-profit private providers are targeting them, but their reach is limited. (2) Since public resources for extension are very constrained, it may make sense for public extension not to duplicate or overlap in the same areas that are being served more efficiently by commercial and non-profit systems. This would leave more public resources for concentrating extension services for farmers in areas that are remote and poorly served by the commercial systems. (3) However, the commercial and non-profit extension systems benefit from the presence of the public extension service- they rely on public extension workers for training and appropriate management advice. So even if the public extension system was to withdraw to the more remote areas where private extension is unprofitable, it may be appropriate to institute some type of commercial contracting of public extension system staff so that the latter can impart needed skills and capacity building to the non-public extension systems. (4) The government should consider contracting the private sector to offer extension services in the disadvantaged regions. Contracting out extension services makes it possible to take advantage of all of the talent and experience existing in the field but does not eliminate a government role which, in addition to funding, ensures quality assurance, oversight, and provision of training and information to contracted services providers. (5) The weight of evidence suggests, in most cases, that private extension is not a substitute for public extension and the public sector should fund extension significantly but in ways that do not duplicate services already being provided by sustainable alternative extension providers.

Key words: Extension services, Privatization, Policy reforms, Kenya

Acronyms

AIDS	Acquired immunodeficiency syndrome
ASCU	Agricultural Sector Coordinating Unit
ATIRI	Agricultural Technology and Information Response Initiative
CBO	Community-based organizations
CGA	Cereal Growers Association
CIG	Common Interest Group
CIP	International Potato Center
COMESA	Common Market for Eastern and Southern Africa
CYMMIT	International Maize and Wheat Improvement Centre
EAC	East African Community
Fips-Africa	Farm Inputs Promotion-Africa
FMF	Farmer Marketing Federation
FSK	Farming Systems Kenya
GoK	Government of Kenya
HIV	Human immunodeficiency virus
ICRISAT	International Crops Research Institute for the Semi Arid Tropics
IITA	International Institute of Tropical Agriculture
KACE	Kenya Agricultural Commodity Exchange
KARI	Kenyan Agricultural Research Institute
KMDP	Kenya Maize Development Program
MSU	Michigan State University
NASEP	National Agricultural Sector Extension Policy
NALEP	National Agricultural and Livestock Extension Programme
NGO	Non-governmental organization
PTC	Production technology category
SIDA	Swedish International Development Agency
SRA	Strategy to Revitalize Agriculture
TAMPA	Tegemeo Agricultural Monitoring and Policy Analysis Project
USAID	United States Agency for International Development

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Tegemeo Agricultural Monitoring and Policy Analysis (TAMPA) project between Tegemeo Institute of Egerton University and the Department of Agricultural Economics at Michigan State University provided support for this research. Kenya Mission of the United States Agency for International Development (USAID) provided financial support for this project. We sincerely thank Francis Karin and Bernard Gathigi for their assistance in data collection and field report compilation. The time afforded to us by our field respondents and other stakeholders interviewed during the course of this study is appreciated. We also do acknowledge comments received during the Tegemeo Institute May 18th 2006 annual conference held in Safari Park Hotel. Comments and advice received David Tschirley of Michigan State University are highly appreciated. The authors however take full responsibility of the remaining errors and missing information.

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1. Introduction

A general consensus exists that extension services, if properly designed and implemented, improve agricultural productivity (Romani 2003, Evenson and Mwabu 1998; Bindlish and Evenson 1993; Birkhaeuser et al 1991). The term 'extension' is here understood to mean 'advisory and other services' that help rural families to make the best possible use of the productive resources at their disposal (Katz 2002). Agricultural extension services provide farmers with important information, such as patterns in crop prices, new seed varieties, crop management, and marketing. Exposure to such activities is intended to increase farmers' ability to optimize the use of their resources. At times even when technologies are available, smallholder farmers have no access to them (Fliegel, 1993). Awareness of existing technologies generates effective demand by providing a critical signal to input distribution systems (Davidson et al 2001). Thus, extension systems and input distribution systems are mutually reinforcing – the contribution of extension to agricultural productivity growth depends on functioning input distribution systems, and vice versa. In addition, ideal extension system provides feedback from farmers to research centres.

The importance of agricultural extension in relation to the fight against poverty has been underscored in the Strategy to Revitalize Agriculture (SRA) (Republic of Kenya 2004). The declining effectiveness of the public extension service has been identified as one among the factors impeding agricultural growth in Kenya. In this regard, SRA has suggested reform of the extension system to create more effective linkages between research, extension and farmers, who are the ultimate beneficiaries. Extension is thus one among the six SRA first-tracked areas requiring urgent fix. Inefficient public extension system has triggered a debate in the developing countries that is calling for a greater role by the private sector (Alex et al 2002, Katz 2002 and Rivera et al 2001). The debate is anchored on the premise that the private sector is more efficient in extension services delivery.

The primary objective of this study is to contribute to this debate by assessing the quality of extension service provision for food crops and livestock in Kenya, with a broad aim of understanding what exists, what works, and why. It seeks to expand knowledge of the existing extension providers, their characteristics, approaches employed and the challenges they face, with the aim of informing the implementation of the new National Agricultural Sector Extension

Policy (NASEP). Given the importance of extension services, and the amount of resources invested in them, such a study is justified and urgent.

The rest of the paper is organized as follows. Section 2 describes the data and methods generating our findings. Section 3 describes the evolution of agricultural extension in Kenya. Section 4 presents trends in government investment in agricultural extension. Section 5 analyzes the relationship between farmers' access to extension services, their use of improved crop technology, and crop productivity, using nationwide household survey data collected by the Tegemeo Institute. The various types of public and private extension services operating in Kenya are described in Section 6, including a summary of their strengths and weaknesses. Section 7 presents conclusions and policy implications of the study.

2. Data and Methods

This study employs both qualitative and quantitative methods and uses primary and secondary data. Secondary data was gathered from government published Economic Surveys, Statistical Abstracts and Public Expenditure Review reports. The paper also draws on nationwide household panel survey data collected in 1997, 2000 and 2004 by Tegemeo Institute in collaboration with Michigan State University (MSU) under Tegemeo Agricultural Monitoring and Policy Analysis Project (TAMPA). This survey covers 1,500 households in 24 districts and is considered representative of the diverse agricultural zones found in Kenya. Primary data was also collected from a sample of the private extension providers operating in the country. Initially, discussions were held with senior extension experts from the two ministries responsible for agricultural extension (Ministry of Agriculture and Ministry of Livestock and Fisheries Development), SRA Agricultural Sector Coordinating Unit (ASCU) and the Kenya Agricultural Research Institute (KARI). The objective of the informal brainstorming sessions was to get a clear picture of the national extension system state of affairs and information gaps to inform the study scope and design. The data from the private extension system were analysed under themes and therefore a ten point checklist was developed on 'good practice indicators' at this stage.

Primary data was collected from five agrochemical companies, 30 non-commercial extension providers and 15 farmer groups. The sample size was deliberately kept small to enable in-depth exploration of the subject and because of logistic constraints. The process of identifying

the agrochemical companies was aided by the senior extension staff and was based on individual company's strength in the extension arena. All agrochemical companies involved in agricultural extension were ranked depending on intensity of extension activities and coverage. Only the highest ranked five companies were picked and appointments booked with their respective extension departments heads for interviews. A multi-stage sampling technique was used to select the 30 non-commercial extension service providers. During the first stage, using non-commercial extension provider-inventory obtained from KARI, all the providers were stratified according to the agro regional zones in which they operate. The number of providers to interview in each stratum was based on the proportion of the number operating in the respective stratum to the total number of non-commercial providers in the inventory. In the second stage, the selection of providers to interview in each stratum was done using simple random sampling technique.

During the preliminary analysis, it turned out that most of the providers were using farmer groups to advance their services. As a case study to gain insights into farmer groups operations, groups from the High Potential Maize (HPM) region were interviewed. These groups were targeted purposively because of logistical reasons and the fact that they are registered with the Cereal Growers Association (CGA). Fifteen groups were picked randomly from the 27 registered groups in Trans Nzoia and Uasin Gishu districts. Nakuru district was purposively added to capture the Farmer Marketing Federations (FMF), formed out of the coming together of individual farmer groups. Three FMF were randomly picked from the list of those working with Farming Systems Kenya (Nakuru) for interview. Focus group discussions were held separately with each group. The discussions involved on average ten members deliberately constituted to include some officials, ordinary members, men and women. A checklist of questions guided the discussions.

In data analysis, we used both qualitative and quantitative tools. To quantify qualitative data contained in respective non commercial provider interview reports, we used a mixture of 'content analysis' and 'truth tables' methods. Content analysis is a technique for gathering and analyzing the content of text (Krippendorff 1980, Mostyn 1985 and Mayring 2000). The content can be words, quotes, phrases, sentences, paragraphs, pictures, symbols, or ideas. The initial step in content analysis involved sorting the content into themes, which depended on the content. In our case, the 'good practice indicators' represented the themes. Next, a coding scheme was devised based on frequency (amount of content) using truth tables. Truth tables are qualitative

comparative analysis tools that provide a bridge between qualitative and quantitative analysis (Hague et al. 1998). Truth tables operate on dummy variables. So if an extension service provider satisfies a predetermined indicator, we scored 'yes or 1' and if not we scored 'no or 0'. The scores were then aggregated across all the non-commercial providers interviewed and average score calculated per indicator. However, content analysis has some limitations. Since not everything always fits in categories, there is always some useful leftover content not accounted for. There are also some limitations on the inferences a researcher can make with content analysis. Lastly, to provide an overview of the private sector extension system, we undertook strengths, weaknesses, opportunities and threats (SWOT) analysis (Salomon and Engel 1997).

3. Evolution of Agricultural Extension in Kenya

Kenya's small farmers have traditionally benefited from two major types of extension systems. The first is the government extension system whereby the ministry in charge of agriculture has played a leading role. This system focuses mainly on food crops and livestock. The government has tried a number of extension models and styles, including the progressive (or model) farmer approach, integrated agricultural rural development approach, farm management, training and visit, attachment of officers to organizations, farming systems approaches and farmer field schools. All these approaches have emerged with varying levels of success.

The second type of extension system includes the commodity-based systems run by government parastatals, outgrower companies, and cooperatives. The commodity-based extension deals mainly, but not exclusively, with commercial crops such as coffee, tea, pyrethrum and sisal. This system is consciously motivated by profits, and tends to work well when both the firm and farmers clearly benefit from the extension expenditures. All aspects of producing and marketing a particular commercial crop are tightly vertically coordinated, spanning the whole range from research, advice, and material support given to farmers, to organizing marketing and even exports.

The performance of the public agricultural extension service in Kenya has been a very controversial subject (Gautam and Anderson 1999). The system has been perceived as top-down, uniform (*one-size-fits-all*) and inflexible and considered a major contributor of the poor performing agricultural sector (Republic of Kenya 2005). Thus, there has been a desire to

reform extension into a system that is cost effective, responsive to farmers' needs, broad-based in service delivery, participatory, accountable and sustainable. Smallholder farmers not only require advice to increase farm productivity, but also advice on a diverse range of rural development options including markets, value addition, and diversified income opportunities. An extension system that does not significantly contribute to improving the lives of its clientele is inappropriate.

As a result of ineptness in the public extension system, a third type of extension service -- private agricultural extension system -- has emerged comprising of private companies, non-governmental (NGOs), community-based (CBOs), and faith-based organisations (Nambiro et al 2005 and Rees et al 2000). Privatisation is used in the broadest sense - of increasing private sector participation, which does not imply a transfer of state-owned assets to the private sector. The entry of private actors in the agricultural extension provision has raised questions about their strengths and weaknesses: how different are they from the public extension system? Under what circumstances does agricultural extension cease to be a public good -- can it be performed more efficiently by private agencies? Is it prudent to operate parallel extension systems (public and private)? What is the new role of the government under these circumstances? To respond to these concerns, the government has embarked on a decisive move to revise the national extension policy by preparing the National Agricultural Sector Extension Policy (NASEP) and the NASEP Implementation Framework (Republic of Kenya 2005a).

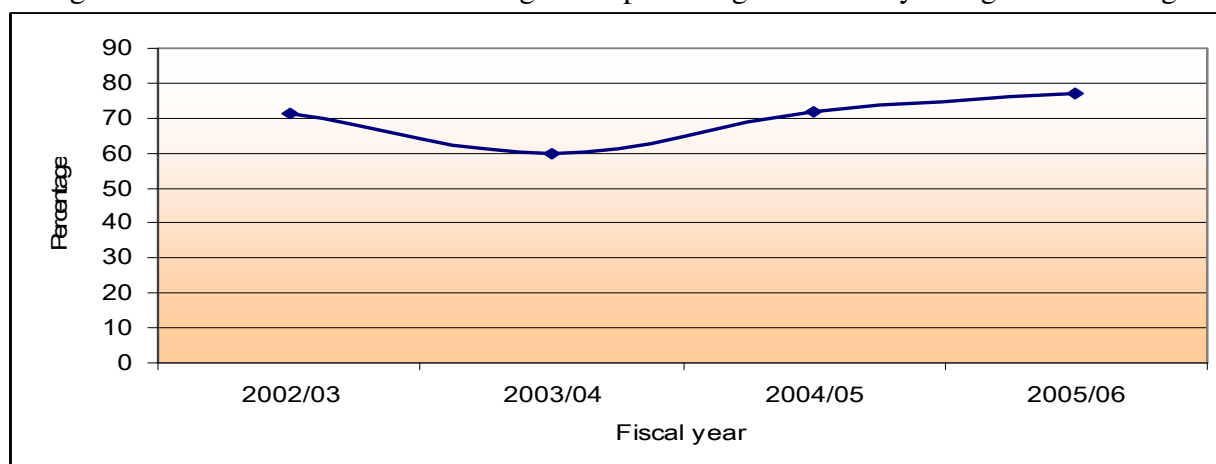
4. Government Investment in Agricultural Extension Service

Agricultural extension in Kenya is centralized. Its structure and budgetary flow of funds is also hierarchical and bureaucratic. Figure 1 below shows the trend of the proportion of the Ministry of Agriculture budget taken by the extension and research services over the years. The high proportion of extension budget over the entire ministry's budget can be attributed to the renewed donor funding of development projects in Kenya since the new government came into power beginning year 2003.

Extension and research being a core function, they have generally received the lion's share of the ministry's annual budget, averaging 70 percent. While this can be viewed positively, its composition is worrying. The public expenditure review 2005 indicates that during the period between 2002/03 and 2005/06, over 43 percent of the total extension and research budget was

transferred to KARI while 49 percent consisted of recurrent budget going into paying employees salaries; these allocations left a paltry 8 percent for operations, demonstration plots, vehicle maintenance, and new equipment and vehicles (Table 1). Even though we may not have a benchmark as to what a *reasonable* allocation constitutes, the amount allocated to operation and maintenance is too small as corroborated by casual field observations that -- except in places where public extension officers collaborate with private extension agencies -- in certain districts, extension vehicles are in a state of disrepair, not to mention the unavailability of running expenses. While donor funds are mostly channeled to development expenditures, the sustainability of such funds is uncertain and unstable due to donors' unpredictable policies and hence is not a sustainable long-term strategy for agricultural development financing.

Figure 1. Extension and research budget as a percentage of Ministry of Agriculture budget



Source: Data sourced from Ministry of Agriculture, Public Expenditure Review, 2006

Table 1. Actual extension and research services expenditures (percentage)

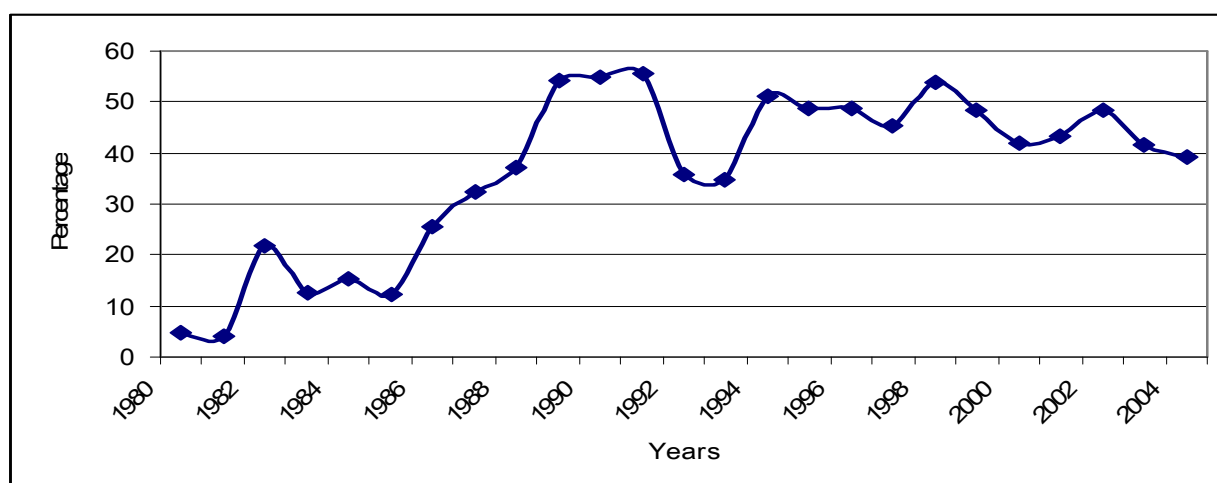
	2002/ 03	2003/ 04	2004/ 05	2002/ 03	2003/ 04	2004/ 05	2005/ 06 ¹
Salaries & Wages	49.1	48.5	52.1	49.3	47.9	52.2	43.9
Operation and maintenance	8.0	7.7	5.3	8.4	8.3	6.1	10.1
Plant & Equipment	0.3	0.9	0.2	0.3	1.0	0.2	1.6
Transfers & Subsidies (Research)	42.6	42.8	42.4	42.0	42.8	41.5	44.4
Total	100	100	100	100	100	100	100

Source: Ministry of Agriculture, Public Expenditure Review, 2005

¹ Printed estimates

The share of the extension staff to the total Ministry staff has generally declined since 1995 (Figure 2). The decline is attributed to retrenchment and a freeze in government employment within the ministry for over a decade until recently². Natural attrition, through retirement and deaths, especially related to HIV/AIDS, has also adversely affected the quality and scope of public extension services. A significant proportion of senior staff will be retiring over the next three years. What is perhaps of utmost concern is that even if the hiring freeze were to be lifted today, it would take a number of years for the new recruits to gain the experience and insights of the staff they would be replacing.

Figure 2. Extension staff as percent of total staff in Ministry of Agriculture



Source: Republic of Kenya, Printed Estimates, various years

Solving the twin problem of under-funded operation and maintenance as well as inadequate extension staff represents an enormous challenge on the part of the ministry. This will require a lot more funding from the government as well as departmental staff size reforms to increase the proportion of the extension staff. As the government looks forward to dedicating 10 percent of its national budgetary resources to agriculture³, these are some of the areas the government should consider increasing funding.

² In May 2006, the ministry recruited 200 agricultural officers and posted them to the field.

³ The government is a signatory to the Maputo Declaration, in which the African Heads of States and Governments agreed to adopt sound policies for agricultural and rural development, and committed to allocating at least 10 percent of their national budget to revitalize the agricultural sector.

5. Extension Services Access and Technology Adoption

In this section, using Tegemeo Institute/MSU TAMPA household survey data and other available cross sectional data sets, we explore farmer access to agricultural inputs and services as well as technology adoption and productivity. Table 2 presents the relationship between households' use of hybrid maize seed, inorganic fertilizer, and distance to the nearest extension service as well as maize productivity per acre. Maize is used as a proxy for other crops because it is the country's staple food crop and is grown widely across the country (Muyanga 2004). Households using purchased hybrids together with fertilizer realized the highest productivities of 8.6, 12.3 and 10.3 90-kg bags per acre in 1997, 2000 and 2004 respectively. Those households that did not use hybrid seeds and inorganic fertilizers realized low maize productivities: 2.1, 3.3 and 2.7 90-kg bags per acre in the same periods under consideration. Apparently, households closer to extension service providers used high yielding technologies and realized higher yield than households far away from such services. While other factors most likely contribute to these relationships, the proximity to extension services does appear to be correlated with small farmers' uptake of productivity enhancing technologies.

Households that reported using both fertilizer and hybrid maize seed registered a productivity increase of about 291 percent over the period, compared to those that did not use these productivity enhancing technologies. Those that used hybrid seed without applying fertilizer registered a 133 percent rise while those that used fertilizer on non-hybrid seed realized an 88 percent increment. Table 3 presents average distances between farmers' homesteads and where they can access both crop extension and livestock advisory services, either private or public, across the agro regional zones over the three panel periods. Distance to crop extension and livestock advisory services averaged about 5.4km and 4.4km respectively over the period. However, distances to extension services remain long in some regions. For example, rural households in Coastal lowlands are as far as 11.4km and 10.6km on average away from crop extension and livestock advisory services respectively. Distances to extension services in the Central region are basically low. It is worthy to note that areas characterized by long distances to agricultural extension are also associated with low maize productivity. This can be interpreted to mean either lack of extension at close proximity to households causes low agricultural productivity or agricultural extension agents are not keen to serve low productive areas.

Table 2. Input use, productivity and distances to extension service provider

Used Fertilizer	Used hybrid maize seed	2004		2000		1997	
		Yields	Distance to Extension Service	Yields	Distance to Extension Service	Yields	Distance to Extension Service
Yes	Yes	10.33	4.51	12.26	4.75	8.62	4.74
No	Yes	8.14	4.78	4.62	5.67	4.88	4.96
Yes	No	4.62	5.54	5.68	5.02	4.78	6.13
No	No	2.15	8.58	3.26	7.04	2.72	7.73
Total		7.87	5.26	8.66	5.38	6.66	5.38
Marginal increment in productivity (%)							
Yes	Yes	380.47		276.07		216.91	
No	Yes	278.60		41.72		79.41	
Yes	No	114.88		74.23		75.74	
No	No	0.00		0.00		0.00	

Source: TAMPA 1997, 2000 and 2004. Yields-90kg bags/acre, extension- distance in Km to nearest extension provider

Table 3. Distances to extension services (Km) and maize productivity across regions

	1997			2000			2004		
	Distance to crop extensions	Distance to vet. extension	Maize yields	Distance to crop extension	Distance to vet. extension	Maize yields	Distance to crop extension	Distance to vet. extension	Maize yields
ARZ									
Coastal Lowlands	9.6	8.9	1.9	12.4	12.2	3.5	12.3	10.6	2.3
Eastern Lowlands	5.5	5.2	2.2	4.6	3.9	3.4	6.0	4.8	3.3
Western Lowlands	6.7	6.2	2.9	7.7	2.5	2.7	6.5	5.4	2.4
Western Transitional	5.7	4.8	5.6	4.5	4.2	7.5	4.7	3.8	8.2
High Potential Maize	5.4	5.1	11.7	6.0	4.6	10.4	5.6	4.6	13.6
Western Highlands	5.3	3.4	5.6	5.2	3.0	11.8	4.8	3.4	6.1
Central Highlands	3.7	2.9	7.1	3.0	2.4	14.8	2.3	1.7	8.6
Marginal Rain Shadow	2.8	4.1	2.4	2.0	2.8	1.1	3.0	3.0	4.3
Total	5.4	4.8	6.7	5.5	4.1	8.7	5.3	4.3	7.9

Source: TAMPA 1997, 2000 and 2004; yields-90kg bags per acre

In Table 4 we present data on average distances to public telephone and cell phone services, which a farmer can access to summon extension workers in case of an emergency. The distances to fixed telephone lines have remained high in some regions. Commonly, public telephone booths, which are relatively cheap to access compared to cell phones, are found in Locational headquarters where in most cases these extension workers are based. Distance to mobile telephone services that households can access was reported at about 1km in 2004. The introduction of mobile phone services is an innovation which extension service providers may consider using to reach farmers. However, even though distance to cell phone services is low, the cost of usage might be relatively high for low-income households to access.

Table 4. Distance to telephone services

Agro-regional zones	Fixed line 1997	Fixed line 2000	Fixed line 2004	Mobile 2004
Coastal Lowlands	5.3	5.9	5.0	1.4
Eastern Lowlands	6.5	3.7	3.4	1.6
Western Lowlands	3.7	3.2	3.0	.7
Western Transitional	6.2	4.6	3.2	1.4
High Potential Maize	7.8	6.7	6.0	1.6
Western Highlands	3.6	4.3	3.8	.5
Central Highlands	3.1	2.0	2.6	.5
Marginal Rain Shadow	9.1	6.1	7.4	.5
Total	5.6	4.5	4.1	1.1

Source: TAMPA 1997, 2000 and 2004

Even though Table 3 reveals that distance to crop extension has generally remained the same over the years covered by the panel, a lot of changes as far as these distances are concerned may have happened to individual farmers. Farmers moving short distances in 1997 may have been abandoned by extension providers forcing them to walk long distances in 2004. The opposite is also possible- farmers who were far away from extension services in 1997 may be accessing such services at close proximity. We use transition matrices to observe the proportion of households that moved from one extension distance range to another between 1997 and 2004. Of utmost concern is the percentage of households originally at short proximity to extension services that remain in that status compared to those who moved over to longer distances brackets. Table 5 shows that out of those who were 2km and below away from crop extension services in 1997, 57 percent remained in the same distance bracket group in 2004. About 5 percent of that group was over 10 km away from extension in 2004. Conversely, out of the group

that was above 10km away in 1997, 21 percent of them were in 2004 only 2km and below away from extension services. In general, the table paints an encouraging picture of many households previously distance from services now being much closer, and most of those who were close remaining so.

In Table 6 we present distances to extension services across income quintiles. The quintile groups are defined using household per adult equivalent incomes. We observe that relatively poorer households are further away from extension services compared to wealthier households. The 20 percent poorest were on average about 6km while the 20 percent wealthiest were 4.8km away from extension services. It seems that the extension agents deliberately position themselves to serve the economically well-off households.

Table 5. Households distance to extension services dynamics (1997-2004)

		Distance to extension 2004						Total
		Km≤2	2<Km≤4	4<Km≤6	6<Km≤8	8<Km≤10	Km>10	
Distance to extension 1997	Km≤2	57.1	20.2	8.3	4.8	4.5	5.1	100.0
	2<Km≤4	34.2	36.2	13.6	5.3	4.3	6.3	100.0
	4<Km≤6	20.5	24.3	23.3	17.6	7.6	6.7	100.0
	6<Km≤8	26.3	22.9	21.2	11.0	11.0	7.6	100.0
	8<Km≤10	16.7	17.9	19.2	15.4	15.4	15.4	100.0
	Km>10	21.1	19.7	10.9	8.8	9.5	29.9	100.0
Total		35.8	24.8	14.3	8.8	6.9	9.4	100.0

Source: TAMPA 1997, 2000 and 2004

Table 6. Average distances (Km) to extension services by income groups

Income Quintiles	1997	2000	2004
1 (lowest)	6.1	6.1	6.2
2	4.9	5.5	5.5
3	5.3	5.6	5.3
4	5.2	5.5	4.7
5 (highest)	5.4	4.7	4.6
Total	5.4	5.5	5.3

Source: TAMPA 1997, 2000 and 2004

In Table 7, we present mean production costs of monocrop maize production for 6 production technology categories found in Kenya and Uganda (based on Nyoro, Kiriimi, and Jayne, 2004). The 6 production cost categories are: (1) High potential maize-western Kenya, small scale, 1 ploughing, high fertilizer intensity; (2) High potential-western Kenya, small scale,

2 ploughings, high fertilizer intensity; (3) High potential-western Kenya, medium/large scale, 2 ploughings, high fertilizer intensity; (4) Central-highlands Kenya, small scale, 1 ploughing, low fertilizer intensity; (5) Central-highlands Kenya, small scale, 1 ploughing, high fertilizer intensity, and (6) Uganda region, small scale, 2 passes, no fertilizer.

Table 7: Mean Characteristics of Maize Monocrop System, According to Level of Production Costs per Bag and Production Technology Category

	Production Technology Category (PTC)						
	1	2	3	4	5	6	7
Lowest Production Cost Farmer Tercile:							
Production costs/bag ¹	413	424	472	364	452	334	268
Production costs/bag ²	568	562	596	434	569	457	341
Yield (Bags/acre)	20	23	25	15	17	10	23
Production costs/acre	7,475	9,671	11,052	5,361	7,641	3,314	6,189
Fertilizer use (kg/acre)	119	112	114	13	63	0	78
Medium Production Cost Farmer Tercile							
Production costs/bag ¹	692	645	931	713	686	493	407
Production costs/bag ²	923	821	1,139	971	844	558	466
Bags/acre	14	17	15	7	14	13	23
Total production costs/acre	9,383	10,978	13,854	4,690	9,594	6,185	9,338
Fertilizer use (kg/acre)	124	111	137	23	62	0	90
Highest Production Cost Farmer Tercile:							
Production costs/bag ¹	1,611	1,173	2,287	1,754	1,676	1,199	867
Production costs/bag ²	2,350	1,468	2,702	2,226	2,088	1,368	959
Bags/acre	5	11	8	5	8	6	13
Total production costs/acre	7,746	11,784	15,463	8,388	11,209	7,002	9,776
Fertilizer use (kg/acre)	91	121	125	31	88	0	98
Overall:							
Production costs/bag ¹ (for PTC)	940	753	1,230	973	938	670	514
Production costs/bag ² (for PTC)	1,331	957	1,479	1,249	1,167	818	589

Source: Tegemeo Maize Production Cost Survey data, 2003. 1:excluding land rental; 2: including land rental

The salient point highlighted in this table is the range of production costs incurred by farmers in the same areas using the same technologies. For example, in production technology category 1 (PTC 1), which is the High-potential maize zone of Trans Nzoia, small-scale farmers using one plough pass and using over 50kgs of fertilizer per acre, Nyoro, Kirimi and Jayne found that the most efficient third of these farmers had average production costs of 413 Ksh per 90kg

bag (excluding land rental costs). By contrast, the least-efficient third of these farmers had average production costs of 1,611 Ksh per 90kg bag. Similar findings of a wide variance in production costs across farmers in all Production Technology Categories indicate that variations in management practices and husbandry skills are probably very great. Because the survey was designed to minimize differences in agro-ecology within regions, and production categories were stratified by technology type and intensity, the wide variation in production costs within production categories most likely reflects differences in management practices in the cultivation of maize⁴. This result underscores the importance of appropriate extension messages.

Nyoro, Kiriimi and Jayne (2004) estimated that simply by bringing the production costs of farmers in the high production cost tercile to that of the mean in each PTC, the overall production costs for monocrop maize producers would decline from Ksh 851 to 630 per bag, and from Ksh 1007 to 752 per bag for intercrop maize producers. Achieving these gains in maize production efficiency will depend on many factors, but extension is likely to be among the most important. Therefore, the costs to the nation of having an under-performing extension service – in terms of smallholder productivity, incomes, and poverty reduction, and the ability to survive or even thrive after the reduction in import tariffs as implied by impending COMESA and EAC trade agreements – are very high.

6. Agricultural Extension Service Providers

6.1 National Agriculture and Livestock Extension Programme (NALEP)

NALEP is the main government extension program. It is implemented by the Ministry of Agriculture with support from the government (NALEP-Gok) and Swedish International Development Agency (NALEP-Sida). The programme aims at enhancing the contribution of agriculture and livestock to development and poverty alleviation by promoting pluralistic, efficient, effective and demand-driven extension services among farmers and agro-pastoralists. The premise of this approach is that development agents should not do extension alone, but together with all other stakeholders in the area that could provide valuable inputs to the process in order to gain synergy effects. This cooperation should be sustained throughout the entire

⁴ Acknowledging inevitable survey errors

process. The NALEP-Sida approach is in line with the Kenya Government policy on decentralization as well as on agriculture as documented in the SRA. It involves the shifting focal area approach in which officers with specialized skills are deployed in an area to work with frontline extension workers and farmers for a specific period (one year) before shifting to a new area. The degree of implementation of NALEP by the public sector depends on resource availability. The resources provided by NALEP-Sida have allowed better implementation than in NALEP-GoK areas (Republic of Kenya 2005c). NALEP uses a group approach where groups are formed within the focal areas that receive extension services for a whole year under NALEP-Sida, and then they are expected to continue their activities under the supervision of NALEP-GoK. The NALEP-Sida operates within the existing government structure. Rules and regulations are complied with, including reporting mechanisms to ensure accountability. Monitoring has focused on ensuring good transparency and consists of tracking attainment of targets.

Table 8 presents an indication of the NALEP-Sida extension costs. These costs do not include the costs of government extension staff and offices where NALEP-Sida operates. At the division and district level where the programme is implemented, Sida spends about KSh164 million and KSh 72 million annually, respectively. Sida spends about KSh 19 million and KSh171 million at the provincial and national headquarters. NALEP headquarter budget includes procurement of vehicles and equipment for the whole programme. Thus, factoring in the locational operating costs and administrative costs both at the divisional and district level, it costs NALEP-Sida about KSh288 per farmer per year. Generally, Sida is spending about KSh519 per farmer in a year.

Table 8. NALEP-Sida Annual Budget (KSh)⁵

Divisions	164,902,970
District HQs	71,358,030
Provinces	19,158,000
NALEP HQs	171,000,000
Grand Total	426,419,000
<i>Cost per farmer:</i>	
District and divisional budget	288
Provincial, district and divisional budget & below	311
<i>Overall programme cost per year per farmer:</i>	<i>519</i>

⁵ These costs do not include the costs of government extension staff and offices where NALEP Sida operates

Results from the NALEP Phase I (July 2000 – June 2005) project review indicated that most groups and members have managed to improve their production and food security (Republic of Kenya 2006). Farmers' groups formed around a common purpose (CIGs) are a cost-efficient manner to propagate extension messages. However, earlier project review had indicated that the approach reached non-poor farmers and people with high education attainment (Republic of Kenya 2005c). These groups had resources to invest and thus exploited the potential of the introduced technologies. The farmers who could exploit the project benefits are usually those who had access to other sources of income than farming. Also farmers with small pieces of land tended to benefit less. Poor farmers are risk-averse and thus not willing to engage their meager resources to try new technologies, consequently adopting 'wait and see' strategy. However, this approach was credited to have spillover in the form of improved food security situation even in the neighboring project areas. The review also revealed that the accountability is primarily to the government and donor rather than to the primary client- the farmer. NALEP Phase II (2005) is designed on the successful aspects of phase I and to address pitfalls encountered in the first phase. These will include, among other things, revised approach to target the rural resource poor and vulnerable groups; strengthened collaboration with private sector and other service providers; and to promote credit, value addition and marketing activities.

6.2 ATIRI- Competitive grants for research outreach

To ensure that its technologies reached farmers, KARI embarked on the Agricultural Technology and Information Response Initiative (ATIRI) to empower farmers to make technology and information demands on agricultural service providers. The initiative targets community-based organizations (CBOs) as beneficiaries or intermediaries (farmer organizations) facilitating member acquisition of appropriate technologies and information. Grants cover acquisition of technologies, exchange visits to other farmers who have already adopted the technology, visits by the institute's staff, and other costs of observing, learning, and adopting technologies. Smaller grants are given preference over larger ones to expand the number of beneficiaries. The average grant was about US\$3,000. The initiative is working with 178 CBOs to cover 11,835 farm families. Earlier studies have shown that the approach has been successful (Gustafson 2002).

6.3 Private commercial companies

Due to increased competition, companies in agricultural sector realm are providing extension services. Extension is now considered a part of marketing strategy. Their activities involve demonstrating the use of their technologies (e.g. hybrid seeds, fertilizers and crop protection chemicals). Agrochemical companies are also delivering extension advice through farm inputs merchants (stockists) and demonstrations during farmer field days. In the dairy sub-sector, companies are advising farmers about animal feed, delivering veterinary and artificial insemination (AI) services, as well as training farmers on hygienic ways of handling milk. To promote their products, some companies are also co-financing agricultural shows. Table 9 shows an example of the level of investment in agricultural extension by one of the local agrochemical company. The company is spending up to KSh5.5 million on extension activities annually.

Table 9. Agrochemical company's annual extension budget	
Item	KSh
Promotions	1,600,000
Free trial samples	3,000,000
Advertisements	100,000
Meetings and conferences	800,000
Total	5,500,000

Observations from the field indicate that agrochemical companies are to a larger extent focusing profitable enterprises and are thus not keen to extend services to marginal areas. They also target areas served with good infrastructural facilities to minimise distribution costs. Some would pose: 'if you can make enough sales by the time you reach Nakuru (160km from Nairobi), why incur additional costs on bad roads taking inputs to Kapenguria, about 560km from Nairobi?' Even in the areas where they reach, they are mostly interested in prosperous farmers and thus not prepared to invest in building the capacity of the resource-poor farmers.

These arguments hint that the social benefit of providing extension services to farmers in remote areas exceeds the profitability of private firms in providing these services. In such cases,

if indeed the social benefits are high, there is a case for the public sector to intervene. This may indicate an appropriate division of labour for the public and private extension systems: allow the private systems to operate in areas where they have strong incentives to do so, and allow the public sector to undertake or facilitate a socially beneficial role of providing extension services in areas where the private sector is unable to do so.

6.4 Private non-commercial

Many non-profit making entities such as non-governmental organisation, faith based initiatives and community based organisations are providing agricultural extension services. They maintain that their involvement in such activities is motivated by search for sustainable ways to curb chronic poverty prevalence among the rural communities (Picture 1). In Table 10 we present an estimate of the costs of propagating extension services by a non-commercial provider. On average, it costs KSh91 to extend advice to one farmer. This excludes overhead costs, which could be estimated at 10 percent of the field cost.

Picture 1. Plaque at SACRED (Africa) offices, Bungoma

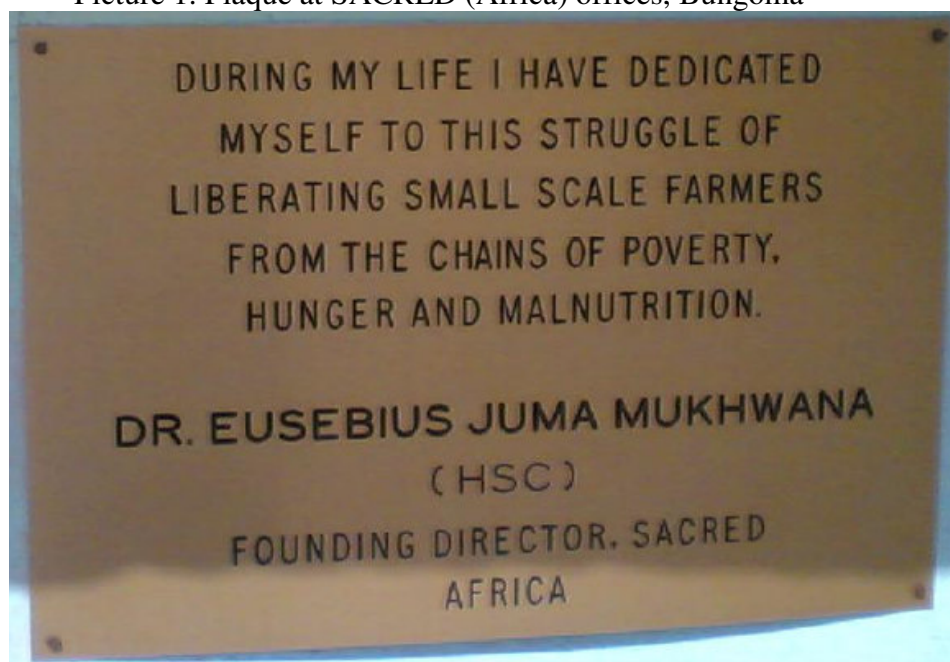
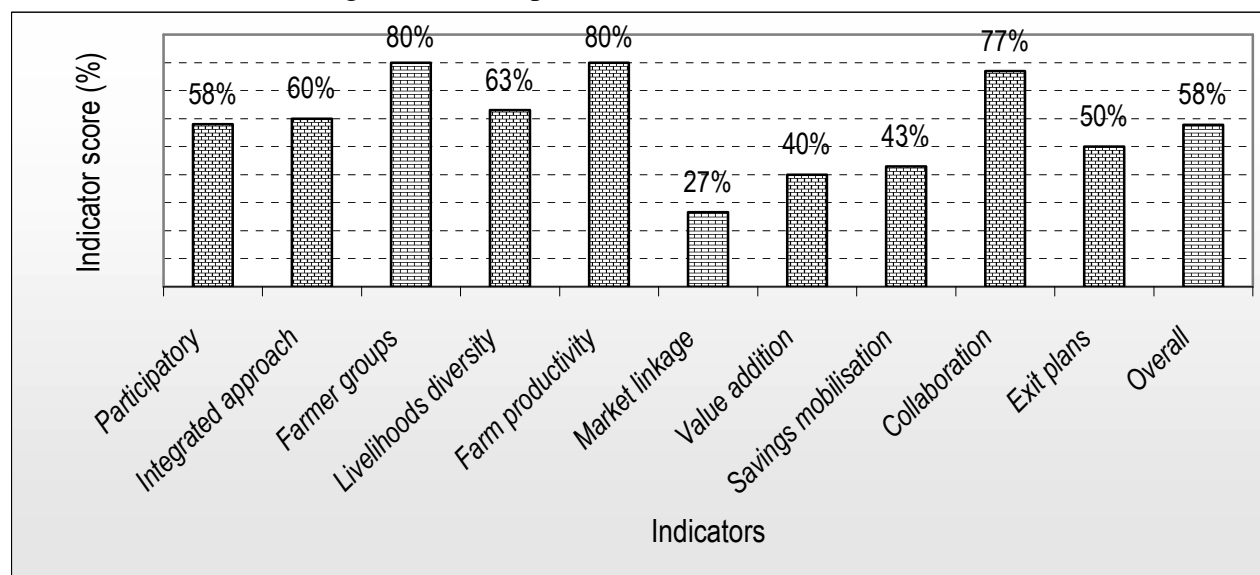


Photo by the field team

Table 10. Non-commercial extension service provider estimated field costs	
Item	KSh
Extension staff imprest lunch- KSh180/day	900.0
Communication in the field	500.0
Transport costs-8 litres per week	592.0
Stationery	300.0
Total	2,292.0
Cost of visiting one farmer	91.0

Next, we present results from the ten (10) *good practice* indicator scores. During the data collection, if an extension service provider satisfies an indicator, we scored ‘1’ and if not we scored ‘0’. The scores were then aggregated across all the non-commercial providers interviewed and average score calculated per indicator. The summary is presented in Figure 3.

Figure 3. ‘Good practice’ indicator score results



Generally, the overall score across all the indicators was 58 percent. The best scored indicators include use of farmer groups in extension service delivery and promotion of farm intensification technologies. The worst scored indicators include promotion of market linkage activities, farm level processing and mobilisation of savings. Detailed individual indicator scores and discussions are presented in the sub sections below.

1) *Participatory approaches*

Suitability of extension approach and content is situation and area specific. What is suitable for one region may be completely unsuitable for another region. Thus, most successful extension providers involve local communities in problem identification and feasible solution search. On average, 58 percent of the non-commercial extension providers surveyed started with participatory needs identification (Figure 3). They facilitated the communities to discuss their problems and identify feasible solutions using suitable methods such as participatory rural appraisal (PRA) or strengths, weaknesses, opportunities and threats (SWOT) analysis.

2) *Integrated approaches*

Rural household problems do not only revolve around agriculture. They are multifaceted and need to be addressed holistically. A mother with a sick child may cherish productivity arising from use of fertilisers, but rationally she must value healthcare even more. Responding to this challenge, some of the extension providers adopt comprehensive approaches. In this study, at least 60 percent of the non-commercial providers interviewed were found to go beyond agricultural productivity promotion to address community social problems such as health care, water and sanitation, education and care of people living with HIV/AIDS (Figure 3).

3) *Farmer groups approach*

Delivering information services to large numbers of sparsely spread smallholder farmers and sometimes living in inaccessible areas is a big challenge. Farmer groups also assist in defining farmers' extension needs thereby organizing demand for extension services and establish a base for co-financing and eventual self-financing of services (Box 1). Majority (80 percent) of the non-commercial extension providers interviewed worked with farmer groups (Figure 3). They are either working with the groups they found in existence or formed new ones where none existed. The cost of seeing a farmer in a group is reduced by more than half. Thus small groups are encouraged to merge. In certain cases, groups are based on 'enterprises of

common interest'. Groups are also registered to become legal entities to enable them enter into inputs procurement or produce marketing contracts and to borrow money.

Box 1: Farmer groups as key intermediaries in extension

The farmer group approach has become popular with most extension providers both public and private in Kenya. On average, groups have 15 members of which about 50 percent are women. All groups surveyed had in place an elected management committee consisting of five executive members and four co-opted members. Most groups ensured that there was gender representation in the management committees. Some of the groups have additional sub-committees to manage specific group activities. For example, marketing sub-committees search for markets for bulked produce and procurement of farming inputs, loan sub-committee looks for credit sources and negotiating credit terms while training sub-committee organises seminars and demonstrations visits. Most of the groups hold meetings once every three months. All the groups visited had a written constitution since it is a registration requirement.

Farming Systems Kenya (FSK) has shifted from the individual group approach to promote Farmers Marketing Federations (FMF). The FMF approach brings together several groups on average of 5-10 groups with a membership of 100-1,000 farmers. FSK has initiated 30 federations from 450 groups with total membership of about 10,000 farmers in Nakuru district. In Uasin Gishu, about 3,000 farmers in 150 groups have been clustered to form Kesses FMF (Picture 2).

The coming together of groups has drastically reduced extension costs per farmer to KSh42. It has also enhanced easier access to loans from micro-finance institutions through group guarantee system. Groups also enjoy price discounts resulting from joint input procurement from manufacturers and low input prices where groups have started input stores. Bulking of farm output empowers groups to negotiate for better prices and result in economies of scale in transport. Groups also form forums for farmers to share information on good production practices, market information, and networking. Using TAMPA data, however, we established that group membership attracts relatively wealthier members of the society.

4) *Income sources diversification promotion*

Rural areas are characterised by low levels of incomes and limited livelihood options. This calls for households not only to grow high value crops but also to engage in diversified income generating activities. About 63 percent (Figure 3) of the providers appreciated this concern and were supporting production of high value crops such as high oil content sunflower. Some non-commercial extension providers are training farmers on other income generating activities like bee keeping, fish farming, poultry and dairy goats keeping. In beekeeping promotion, in certain cases farmers are trained on making modern beehive and constructing low cost beehives house (Picture 3) to accommodate as many as 20 beehives.

Picture 2. Farmers' group input stores

Kiungani farmers' group farm input store, Kitale



Kesses Division FMF, Uasin Gishu



Photos by the field team

Picture 3. Low cost beehives houses

VI Agro forestry, Kitale



Baraka Catholic College, Nakuru



Photo by the field team

5) *Promotion of productivity enhancing technologies*

About 80 percent of the interviewed non-commercial extension providers supported use of productivity enhancing technologies in their programmes (Figure 3). For example, through demonstrations some providers promote new technologies in partnership with the manufacturing companies (Box 2). In the livestock sub-sector, some providers are supporting local goats' and cows' improvement programmes by promoting cross-breeding activities resulting in faster

growing and heavier stocks. For local poultry improvement, farmers are assisted to secure high quality cockerels. While most of the extension providers promote technologies generated by the government research centres, some providers have established links with international research centres such as International Maize and Wheat Improvement Centre (CYMMIT) for maize; International Potato Centre (CIP) for orange fleshed potato; International Crops Research Institute for the Semi Arid Tropics (ICRISAT) for ground nuts; and International Institute Tropical Agriculture (IITA) for cassava, for up-to-date technologies.

Box 2. Kenya Maize Development Programme (KMDP)

To support smallholder maize farmers in the High potential maize zone, some providers have organised themselves into a consortium bringing in partners with different specialisations along the maize value chain. KMDP under ACIDI VOCA⁶, has brought together Farm Inputs Promotion-Africa (Fips-Africa) Dealing with promotion of agricultural inputs; Kenya Agricultural Commodity Exchange-KACE (market intelligence service); and Grain Growers Association-CGA (capacity building and group formation). CGA promotes smallholder farmers' groups' formation and facilitates groups to get registered. Fips in participatory way identifies inputs that have a significant impact on productivity through farm trials. For example, one seed variety is treated to different fertilizer types thus empowering the farmer to choose seeds and fertilizers for their regions. Companies are also encouraged to package their products into smaller packages to make it easier for risk-averse farmers to try on their farms. The consortium also organizes annual meetings where input manufacturing companies meet input merchants (stockists) to talk about their products and their uses, thus empowering merchants to become extension agents. KACE provides commodity prices information in different markets across the country through innovations such as information boards (market information points popularly known as MIPs) placed in market centres. ACIDI VOCA is the coordinating agency and offers useful training to farmer groups such as 'farming as business' and 'power of attitude change'.

6) *Promotion of farm-level processing (value addition)*

While most of the extension providers focused on enhanced production, only 40 percent went beyond production to promote some value addition (Figure 3). Those providers supporting value addition are assisting smallholder farmer groups to acquire skills to undertake simple farm-level processing such as producing dried chips, crunches and cakes from sweet potatoes; butter from groundnut; oil from sunflower; yoghurt from milk and jam from tomatoes. Other aspects of

⁶ Agricultural Cooperative Development International and Volunteers in Overseas Cooperative Assistance

value addition include packaging and labelling honey; sorting, grading and bulking of maize; and preserving vegetables by drying.

7) *Linkage to markets*

About 23 percent of the non-commercial extension providers interviewed assist farmers by linking them to output markets (Figure 3). Some providers assist in markets search for the enterprises identified for commercialisation. Further, farmer groups have been able to bulk their produce thus increase their bargaining power for better prices. Some providers focus purely on providing market intelligence to farmers. Farmers are also trained on how to benefit from seasonal commodity price variations by releasing their produce to the market during the optimal commodity prices period and to avoid dampening prices through flooding the market by selling immediately after harvest.

8) *Promotion of savings mobilisation*

The rural poor must learn to save the little they have for tomorrow. About 43 percent of the providers interviewed promote savings mobilisation (Figure 3). Through their pooled contributions, farmers can access loans for farm inputs that are collectively guaranteed. Some of the providers do supplement members' contributions to enable more members to access loans. In savings mobilisation schemes, farmers are encouraged to market their farm produce jointly to ease loan repayment mechanism.

9) *Collaboration with other stakeholders*

About 77 percent of the extension providers interviewed in this study reported that they collaborate with other extension providers to avoid conflicts and duplications (Figure 3). They invite other providers to participate in farmer events that they organise. They also work closely with the line ministries. In most cases, the public extension experts serve as the resource persons. The public expert is offered lunch and transport, and in certain cases a 'top up' to their salaries. Where the non-commercial extension provider and government relationship is working

according to the government stated standards, this collaboration could be regarded as a form of cost sharing- with the government paying extension workers basic salaries while the development agencies meet their field expenses. Divisional and district stakeholder forums have greatly improved understanding and interaction among extension service providers.

10) Exit strategies

About half of the extension providers covered reported that they have a phase-out plan embedded in their programmes for sustainability of the initiated activities (Figure 3). Programmes without exit plans just ‘abandon’ the farmers at the end of the project and the sustainability of the initiatives they had started are slim. At the start of the project, extension providers are supposed to let the community members know the proposed project duration. Promotion of cost sharing and cost recovery schemes assists in enhancing farmers’ project ownership. Phase-out activities include gradual project staff reduction and letting farmer group leaders take up management roles in the project. In certain cases farmer groups are concerted into community based organisations (CBOs) to carry on with the project activities. To empower the new CBOs, training on resource mobilisation and use, and linkage with service providers and markets is imperative. Some providers donate their office premises to such CBOs.

Overview

Table 11 presents the ‘good performance’ indicator scores across agro-regions present in the country. It is imperative to note that indicators such as levels of market linkages and farm level processing (value addition) activities in crops extension may only be important in surplus regions such as Western highlands, Central highlands and High potential maize zone. To regions such as Eastern lowlands, Coastal lowlands and Northern arid -- characterised by erratic rainfalls, frequent droughts and food insecurity-- identification of suitable crops, productivity promotion and diversification of livelihood options are of utmost priority. Market linkages and value addition activities may only apply to other income generating activities such as beekeeping in such regions. The high potential regions have attracted relatively more extension providers. Qualitative evidence gathered from the field point out that most of the non-commercial providers

are interested in areas where they can generate quick results to please their donors. Thus, low potential regions have attracted relatively low number of extension providers.

Table 11: ‘Good practice’ indicator scores across agro-regions

Indicator	WL	WH	HPM	CH	MR	NA	EL	CL
Participatory	67	75	100	25	0	0	50	40
Integrated	67	75	80	75	0	0	50	40
Farmer groups	100	75	100	25	0	0	100	100
Income sources diversification	67	50	80	100	0	0	50	60
Productivity	100	100	80	50	0	0	100	80
Market linkage	33	50	60	25	0	0	0	0
Value addition	67	50	60	25	0	0	25	20
Savings mobilisation	67	75	80	25	0	0	25	0
Collaboration	100	75	80	25	100	100	100	60
Exit plans	67	75	80	0	0	0	75	40

Key: score range between 0-100%; CH=Central highlands; CL=Coastal lowlands; EL=Eastern lowlands; HPM=High potential Maize; WH=Western highlands; WL=Western lowlands; and NA=Northern Arid

6.5 Private extension system SWOT analysis results

To provide a brief overview of the private sector extension service system, results from strengths, weaknesses, opportunities and threats (SWOT) analysis are presented in Appendix 1. The main strength of private sector extension system relates to financial resources adequacy and lack of bureaucracies and long channels of communication common with the public sector extension systems. Such resources keep their extension personnel motivated and ensure efficient and timely delivery of extension services. The private extension was also found to tap the public sector extension expertise and experience by collaborating with government front extension workers. Unlike the private commercial extension providers, the non commercial providers employ more holistic and participatory approaches in extension delivery. Also, they were found to go beyond production promotion to support farm level processing and market linkage activities. Since they are not motivated by profits, they target all farmers irrespective of their social economic status in the areas where they operate.

Turning to weaknesses, the private commercial extension providers were found to concentrate their efforts in agricultural high potential areas and to target relatively affluent farmers because they are motivated by profit. As they endeavour to outdo their competitors, they find themselves spread too thinly on the ground and unable to promote superior products from rival companies. On the other hand, non commercial providers' coverage was found to be very limited and targeting enterprises that yield quick results. The project durations are sometimes too short to have impact while sustainability of their initiatives once they pull out is usually uncertain. There are still some potential unexploited opportunities open to the private extension system. The private commercial providers can consider collaborating with other players offering non competing services along the value chain for synergy. They can also consider venturing into input credit schemes to boost their sales while facilitating farmers' timely farm inputs acquisition. They should also consider funding public agricultural research as part of their corporate social responsibility. With the government extension policy evolving towards pluralism in service delivery, the non commercial providers stand to benefit from public funding to extend services in disadvantaged areas. By encouraging farmers to form groups and apex federations, the private sector reduces extension costs tremendously.

Turning to threats, the private commercial providers' activities are constrained by non commercial providers who offer farm inputs for free. Also, the unpredictable government interference in farm input distribution impedes their activities. Poor physical infrastructure increases their operational costs and sometimes forces them to reduce their coverage. The major threat to the non commercial providers includes high expectation for free handouts by their clients. Where providers supply inputs on cost recovery basis, their activities are constrained by crop failure. Most of them were found relying on limited sources of funding and in most cases over dependent on external sources.

7. Conclusion and Policy Implications

Even holding constant agro-ecological zone and production technology, there are wide variations in farmers' costs of production. Variations in management practices and husbandry skills are probably very great. Simply by bringing the production costs of farmers in the high production cost tercile to that of the mean in each PTC, the overall production costs for

monocrop maize producers would decline from Ksh 851 to 630 per bag, and from Ksh 1007 to 752 per bag for intercrop maize producers. Achieving these gains in maize production efficiency will depend on many factors, but extension is likely to be among the most important.

Private extension provision is generally skewed towards high potential regions and high-value crops. Remote areas and poor producers, especially those growing low-value crops with little marketable surplus, are poorly served. Non-commercial providers are targeting them but their scope is limited. Since public resources for extension are very constrained, it may make sense for public extension not to duplicate or overlap in the same areas that are being served more efficiently by commercial and non-profit systems. This would leave more public resources for concentrating extension services to farmers in areas that are remote and poorly served by the private extension systems. However, it has emerged that the private extension system benefits from the presence of the public extension service. The alternative systems rely on public extension workers for training and appropriate management advice, so even if the public system were to withdraw to the more remote areas where private extension is unprofitable, there would still need to be provisions made for the commercial extension and public extension services to learn from each other, coordinate messages, and mutually support each other. It may be appropriate to institute some type of commercial formal contracting of public sector extension system staff so that the latter can impart needed skills and capacity building of the commercial extension systems.

The government can as well consider contracting the private sector extension system to provide extension in orphaned areas. Contracting out extension services makes it possible to take advantage of all of the talent and experience existing in the field but does not eliminate a government role which, in addition to funding, should include quality assurance, oversight, and provision of training and information to contracted services providers. The government should also retain the responsibility of establishing criteria for use of funds, define specific objectives for each locality, train extension staff, and develop appropriate extension methods as well as monitoring and evaluation. The government should be available when called upon by the private extension for technical expertise and should serve as the final reference or arbitrator of conflicting extension information and approaches. However, for the government to play these roles adequately, the extension staff must be kept abreast with emerging technologies (technologies are changing swiftly) through regular training and refresher courses, energized and

motivated. The public extension system should view the private extension system as co-workers out to complement their activities, and not as competitors. We concur with many other analysts who have concluded that private extension is not a substitute for public extension and the public sector will continue funding extension significantly in the foreseeable future (Sulaiman et al 2005, Alex et al 2002).

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Appendices

Appendix 1. Private sector extension providers SWOT Analysis

Category	Strengths	Weaknesses	Opportunities	Threats
<i>Private commercial companies</i>	<ul style="list-style-type: none"> Highly motivated personnel No bureaucracy and long channels of communication Sufficient financial resources and better logistical support Work closely with public extension system Timely in service delivery 	<ul style="list-style-type: none"> Uncoordinated interventions as they compete for clients Spread thinly on the ground Driven by profits-serving only high potential areas and more interested in well-of farmers Cannot promote better products from rival companies 	<ul style="list-style-type: none"> Collaboration with players offering non-competing services along the value chain Can venture in input credit schemes Can gain more acceptance if could partner in funding public research 	<ul style="list-style-type: none"> Non-profit players providing free inputs Government policy-interference through input subsidies and distribution Low levels of rural incomes Poor physical infrastructure increase operations costs
<i>Non-commercial (NGOs, FBOs, CBOs)</i>	<ul style="list-style-type: none"> Sufficient financial resources and logistical support Work with all farmers irrespective of socio-economic status More holistic in approaches Use participatory approaches to understand community needs and thus effective community participation No bureaucracy and long channels of communication Use public extension staff as resource persons Going beyond production to support value addition activities and market linkage. 	<ul style="list-style-type: none"> Limited coverage Selective-target initiatives and areas that yield quick results Some performance measured by resources spent Programmes too narrow and short to have much impact Project sustainability not guaranteed once they quit 	<ul style="list-style-type: none"> Can tap public funds to extend services to less profitable and neglected areas Donors will fund well-designed programmes with demonstrated impact Use of farmer groups federations can enhance service delivery by reducing costs 	<ul style="list-style-type: none"> High expectation-communities expect free handouts Uncooperative providers supplying inputs for free making operations by others difficult Erratic rains making cost recovery of inputs difficult Overdependence on external financial resources Conflict between community identified needs and donor interests Subject to political pressure to increase coverage Culture affects adoption of some technologies

Appendix 2. Learning from other developing countries

Uganda Case- Extension Decentralization, Privatization, and Reform

The National Agricultural Advisory Services (NAADS) project, part of the Plan for Modernization of Agriculture, is based on strong government commitment to decentralization and private sector development. Its objective is to improve the productivity and livelihoods of farmers, by establishing a relevant and responsive contract-based agricultural advisory service. This involves the transforming of the existing publicly delivered national level extension service to a decentralized, largely farmer-owned, private sector advisory services system. Components of the project are:

- Advisory and information services to farmers. NAADS provides funding and training for initiatives from farmers groups, working in conjunction with local government, to contract for private agricultural advisory services.
- Technology development and linkages with markets. NAADS provides funds to farmers to contract researchers to work with them in their fields on technology and market development and adaptation.
- Ensuring quality of services. NAADS funds the development of a regulatory framework and service standards for service providers.
- Promotion of private sector institutional development. NAADS provides limited funding on a competitive basis for retraining and technical upgrading for service providers. In addition, the project provides a comprehensive package of benefits, including training, which will enable public sector extension providers to transition to employment in the private sector.
- Program management, monitoring, and evaluation. NAADS establishes and supports national and district level entities to coordinate, monitor, evaluate, and administer the project.

The project philosophy, consistent with the government vision, includes:

- *Independence and flexibility.* The NAADS board is a small and semi-autonomous unit. It is not housed within either the Ministry of Agriculture or the National Agricultural Research Organization.
- *Further decentralization.* Responsibility and funding for agricultural advisory services are being moved from the district level to the sub county and farmer level.
- *Contracting out services.* The government has decided to give districts strong incentives to reduce the number of extension providers employed as civil servants, in favor of contracting the services of agricultural advisers.
- *Cost sharing.* The government has decided to institute, at a gradual and deliberate pace, the requirement that farmers and local governments pay part of the cost of the project.

Sixteen districts, which cover a total of 224 sub counties, are in a pilot phase of the NAADS project. Organized into local groups some 8,000 farmers participate collectively in decision-making processes. The framework developed for extension services provides a strategic base for rural information and communication services. Farmer control of resources provides and strengthens previously weak linkages to the research system, makes technologies more accessible, and facilitates the use of farmer innovations and

local knowledge. The private sector advisory partners have begun to register as companies and eventually extension services will be completely privatized. Current extension workers, who will soon become private sector service providers, are involved in retraining to match their skills with what is required by private sector advisory services.

Lessons Learned and Issues for Wider Applicability

- Participation of local professionals, such as policymakers, researchers and extension agents and beneficiaries throughout the project planning and implementation stages is of critical importance.
- A responsive training program must be established for the staff of the extension system.
- Flexibility is required to meet the needs of a heterogeneous population of beneficiaries. When the delivery of extension services has been limited to one delivery mechanism this has often been difficult to achieve. Enabling sub counties and beneficiaries to contract with any qualified institution or entity to deliver advisory services will permit great flexibility in the types of delivery mechanisms that might be employed.

Source: World Bank 2004

Chile Case: Contracted extension services

Contracting of private extension service providers in Chile was introduced in 1978. Evaluations report positive results from contracted services, and there is no support for return to a system of government service provision. Until 1983, farmers with potential for commercial development were provided with vouchers to use in purchasing extension services. Limitations associated with this system led to a more demand driven program, with farmer organizations proposing defined projects for commercialization and modernization of small-farm agriculture. As Beynon et al. 1998 reports, for contracted extension programs to be successful, the following lessons have been learnt in Chile:

- Design different programs to serve different categories of farmers and different program objectives.
- Decentralize program design and contracting to regional and municipal (district) levels to expand participation of farmers.
- Expand market orientation and marketing services within programs.
- Provide good technical support services and training to contracted extension agents.
- Establish good evaluation and monitoring systems at the national level.

Source: Beynon et al. 1998