Kenya Maize Development Programme II Performance Evaluation-2012

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KENYA MAIZE DEVELOPMENT PROGRAMME II

PERFORMANCE EVALUATION

SEPTEMBER 2012

DISCLAIMER

The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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ACDI/VOCA	Agricultural Development Cooperative International/Volunteers in Overseas Cooperative Assistance
CGA	Cereal Growers Association
CHH	Child Headed Household
FIPS	Farm Inputs Promotion
FTF	Feed The Future
FNM	Female No Male type of Household
IVRS	Interactive Voice Response Service
KACE	Kenya Agricultural Commodity Exchange
KARI	Kenya Agricultural Research Institute
KEPHIS	Kenya Plant Health Inspectorate Services
KMDP	Kenya Maize Development Programme
M & F	Male & Female type of Household
MCC	Market Call Centre
MNF	Male No Female type of household
MOA	Ministry of Agriculture
OCAT	Organisation Capacity Assessment Test
RECOTIS	Regional Commodity Trade & Information System
SHA	Small Holder Association
SMS	Short Messaging Service
VBAs	Village Based Advisors
USG	United States Government

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EXECUTIVE SUMMARY

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Introduction

Since January 2011, ACDI/VOCA implemented the USAID funded Kenya Maize Development Program II (KMDP II) follow-on grant in continuance to the KMDP cooperative agreement which ran from 2003 to 2010. ACDI/VOCA implemented KMDP II programme in consortium with three grantees; the Cereal Growers Association (CGA), Farm Input Promotions (FIPS)-Africa, and the Kenya Agricultural Commodity Exchange (KACE). The program's objectives contributed towards USAID/Kenya's Strategic Objective 7*: Increased Rural Household Incomes through sustained economic growth* through improved production and marketing efficiency in maize and other selected alternative staple crops among small holder producers towards the US Government's *Feed the Future* Initiative.

1.11 Program Goals

The key program objectives were:

- Increase incomes for 20,000 households producing and consuming maize as well as selected staple crops in targeted regions of Kenya.
- Streamline gender and youth considerations in the programme activities in both maize and other staple crop value chains.
- Intensify smallholder's business engagement capacity

Geographical Scope of the Programme

KMDP II was funded through the US Government's Feed the Future Strategic mechanism with geographical focus in Kenya's:

- Rift Valley (Uasin Gishu, Trans Nzoia, Nakuru, Bomet, Laikipia),
- Medium potential productivity areas (Bungoma, Kakamega-Lugari and Nyandarua in Central)
- Marginal potential areas in Eastern Kenya (Embu, Machakos, Makueni, Kitui, Mbeere counties) and
- Nyanza Province (Siaya and parts of Kisii/Nyamira).

The geographic regions, part of USAID's HR1 (high rainfall zone) and SA2 (Semi-arid zones) included a sizeable proportion of Kenya's arable land, allowing crop diversification and increased food security.

During the follow-on period, the program supported key staples value chains including maize, legumes, beans, Irish potatoes, sweet potatoes, cassava, cow peas, green grams and sorghum. Crop selection was geographically stratified according to the suitability of the crop to the agro-ecological zone, as well as consumer preferences and the supply/demand of each crop per geographic area. It was anticipated that the crop stratification would ensure an optimization of programme resources and scalability.

ACDI/VOCA and its partners implemented the Kenya Maize Development Program (KMDP II) since January 2011 with the program's end date being September 30, 2012. Part of the key project deliverables required on all USAID funded projects is to carry out a rigorous performance evaluation at the end of the project period. A performance evaluation was therefore carried out between August and September 2012.

The objectives of the performance evaluation were:

(i) To measure the success (development effectiveness) of KMDP II project in reaching the desired objectives along the value chains (production, processing, Marketing) given the design and implementation approach adopted by the project
(ii) To generate lessons from the design and implementation process with an aim of sharing best practices forming the basis for updating standards and practices within the industry
(iii) To identify areas where KMDP II realized significant development results, and those where less success results were achieved and therefore need improvement.

The end term evaluation targeted farmers' households (maize and other staple food farmers) in the project areas as below:

- Rift Valley- Uasin Gishu, Transnzoia, Nakuru, Bomet, Laikipia
- Bungoma
- Central- Nyandarua
- Machakos, Makueni,
- Nyanza- Siaya, Kisii/Nyamira

The evaluation methodology use literature review, quantitative and qualitative research techniques. A total of 815 farmers were interviewed.

1.0. Achievement of Programme Objectives

1.1 Intermediate result 1 –Increased Productivity of staples crops in target areas.

One of the key indicators for the programme was the number of individuals who had received USG supported short term agricultural sector productivity training. The findings indicated that KMDP targets over the last year (2011) and in the first quota of 2012 in terms of the number of people to whom significant knowledge and skills were imparted either through training seminars, field days, demonstrations and technical assistance by KMDP itself or in collaboration with the partners were surpassed by big margins. 19,634 demonstrations were conducted and 3,024 field days conducted as well. In the second quarter of 2012, a total of 162 households (89 males, 73 females) from Nakuru and Laikipia benefited from improved maize and potato seeds provided for the establishment of demonstration plots as training tools for farmers and an additional 1400 households received training on post harvest handling, storage and mangement. The KMDP 2011 targets were 20,000 farmers. The programme managed to train a total of 23,177 farmers exceeding the target by 15.9%.

1.1.1 Extent to which the programme caused farmers to adopt new technology

A comparison of farmers' knowledge on the various technologies before and after the training shows there was a high level of impact of the training on farmers. Farmers' level of knowledge in post harvest handling increased by 39%, 28% in the use of improved seeds, 24% in fertilizer application, 42% in farm business management, 33% in improved tillage, 39% in processing innovations, 31% in crop protection measures, 31% in natural resource management, 32% in new crop types, 35% in market access, 40% in warehouse receipt system and 35% in crop insurance. It is worth noting that this increase in knowledge was for farmers who had received the specific trainings. Therefore, there was a high level of adoption of the various technologies in which farmers were trained with 95% of the farmers stating they had used the farming technologies trained on in their farms.

1.1.2 Contribution of the KMDP II project to the overall goal of Feed the Future program

The main benefit for the farmers of the new crops they had planted was that they were food for family consumption. This benefit was key to farmers as well as for the programmes' objective in creating food security for the farmers' households. These crop types were also drought resistant, profitable and had high yields. Majority of the farmers interviewed confidently stated that they could now feed their families and have surplus for sale. Farmers were also able to invest in other in some generating activities as well as provide for their families' needs. The inclusion of kitchen gardens in the farmers' farms served as food supplement for the households as well as a source of improved nutrition.

1.1.3 Yields per acre

The average acreage used for maize production was 2 acres (3.3 acres during baseline). This was higher for male headed households (3.3 acres compared to female headed households 2 acres). The average maize yields per acre were 11.6 90 kg bags per acre which was slightly lower than that recorded during the baseline (12.5 bags). There were generally increase in yields for most of the areas except Siaya. Maize crop yields increased for Bungoma whose average yield was 911 Kgs per acre during the baseline and now recorded 1,329 Kgs, yield for Makueni increased from 357 Kgs per acre to 453 Kgs, 1,191 Kgs in Nakuru to 1,238, 1,508 Kgs in Transnzoia to 1,491 and 1,572 in Uasin Gishu to 1,647. Acreage for other crops were 2.0 for beans (2 acres at baseline, 1.9 for green grams (0.5 at baseline) 1.4 for cow peas (1.6 at baseline) and 2.2 for pigeon peas (baseline 2.1). Yields were also higher for male and female households (1.154 tonnes for maize and 0.520 tonnes for beans) compared to female headed households (1.028 tonnes for maize and 0.415 tonnes for beans).

1.1.4 Gross Margins

An average of 12 90 kg bags of maize was harvested for farmers who sold their produce with the highest number being in Uasin Gishu and Transnzoia. The average number of bags sold was 8.8 90 kg bags. Regions selling the highest number of bags were Uasin Gishu, Laikipia, Transnzoia and Bungoma. The gross margin for maize farmers was Ksh 21,910 up from Ksh 10,373 during the baseline. This increase could mainly be attributed to higher prices at which farmers had sold their harvests in the last cropping year. The average price for a 90 kg bag of maize was 2,671 compared to 1,575 at the baseline. There were variations in price in the regions with Nakuru, Machakos and Kisii experiencing high prices. Lower prices were experienced in Makueni and Siaya which also recorded lower gross margin.

An average of 3.8 90 kg bags of beans were harvested by farmers who sold their produce the highest being in Kisii (11 90 kg bags) and the lowest in Makueni (1.1), Bomet and Laikipia. The average number of bags sold was 3, with farmers in Kisii selling the most (10 bags) and those in Bomet selling the least (0.7). Price variations for beans were recorded with regions such as Machakos and Kisii recording very high prices. The average price for a 90 kg bag of beans was 3,849 which was slightly higher than that recorded during the baseline (3,258). Gross margins for maize were also higher for male headed households (23,780 Ksh) compared to female headed households (19,871 Ksh)

1.1.5 Storage and Post Harvest Loss

The type of stores for different crop types varied with 40% of farmers under the producer group approach storing their maize harvest in an improved type of store while 58% of farmers under the village approach used a room in the house for storage. Beans were mostly stored in a room in the house and in improved stores. It was noted that most farmers under the village group approach had no proper storage facility, mainly using a room in the house for their storage.

The use of improved stores for maize was highest in Uasin Gishu (60%) and least in Nyamira. The use of traditional stores for maize storage was seen in Makueni (62%) while farmers in Siaya mainly used a room in the house for storage of both maize (84%) and beans (81%). It should be noted that Siaya recorded least ownership of improved stores and highest use of room in the house during the baseline indicating no change in store type over the period. The use of improved stores for beans was noted to be highest in Bomet (58%) while that of traditional stores was highest in Machakos (53%).

More than three quarters of the farmers stated they intended to continue with their current storage method. Of note is that farmers also using the traditional stores and a room in the house also intended to continue using them. Majority of the farmers storing their beans in an improved store intended to continue using this storage facility (91%) while 16% and 28% of those using traditional and rooms in the house had the intention to change.

Three quarters of the farmers stated they had gained knowledge on the use of good storage facilities with slightly more females than males stating this. There was also a higher proportion of farmers in Transnzoia, Machakos and Makueni saying they had gained knowledge on the use of good storage facilities. Farmers had also gained knowledge on the control of diseases this being higher for males and farmers in Machakos, Makueni and Bungoma. Control of rodents was also by quoted 61% of farmers as knowledge gained on harvesting. The impact of this knowledge was seen more in Laikipia (91%) and Kisii (77%)

At least 47% of farmers indicated they had experienced some post harvest loss. This was slightly lower than that during the baseline (52%). Farmers who lost their maize harvest lost 21% of their produce. There was significant loss for beans produce where farmers lost 42% of their produce.

1.2 Intermediate result 2: Increased Trade and Market Access

1.2.1 Marketing Technology

Overall, the total number of beneficiaries who had received training on trade and market access as of June were 4,044. The target for individuals to be trained was 2000 (1200 male and 800 female beneficiaries). Towards this target, KMDP partners managed to successfully meet and surpass the target by 102%. The partners who facilitated the trade and market access trainings were KACE and CGA.

However from the quantitative data, only 10% of the farmers said they had used the new markets which had been introduced to them through the program. Among the farmers who had ventured into the new markets, the key benefit was better prices at the markets.

On usage of the market information systems by the farmers, quantitative data indicates that the SMS was the most used system at 53% followed by the radio programme Soko Hewani (38%). The farmers recorded very minimal usage of the other MIS systems such as the KACE website (2%), RECOTIS (2%) and Market Call Centre (6%). It is however important to note that Soko Hewani, which was a more effective MIS in terms of reaching the farmers was taken off air in September 2011 due to the high cost of airing the programme. It is probable that if the programme was still on air, the number of farmers who had accessed would have been much higher.

Generally the farmers recorded low levels of knowledge with the various MIS. Overall level of knowledge with use of SMS for market information was at 30%, use of KACE Market Call Centre was 21
%, KACE website (19%), IVRS Kilimo Hotlines (18%) and RECOTIS was lowest at 17%. It therefore, suffice to say that low levels of knowledge on usage of the systems to source for market information was one of the factors influencing the slow rate of adoption of this technology by farmers. Other reasons cited by farmers who had not adopted the technology included limited or no access to internet, low yields thus they did not have much to trade, cost implications of the services and lack of education. Still, there was low intention by farmers to use these technologies to access market information (RECOTIS, IVRS and other technologies requiring internet use) in the future.

1.2.2 Market Access and Trade

From quantitative data, 63% of the all farmers interviewed said they had traded farm produce in the last cropping season while the remaining 37% had not. From the regions, Laikipia had the highest number of households which had traded farm produce (97%), followed by Uasin Gishu (87%), Trans Nzoia (87%), Nyandarua (86%), Nakuru (78%) and Bungoma (76%) respectively. In Kisii/Nyamira only 57% of the households had sold part of what they harvested while in Makueni (36%), Bomet (31%) and Machakos (27%) fewer households traded their produce. Siaya was the region with the least households which had sold farm produce from the last cropping season.

Quantitative data across the regions indicated that the main crops traded were maize (93%), Beans (48%) and Irish Potatoes (11%). The key avenues where maize produce was traded included brokers (37%), small traders (21%), large traders (12%), institutions (12%), direct consumers (12%) and village markets (11%). Beans produce was also mainly traded through brokers (33%), small traders (24%), institutions (17%) and the village market (17%). Brokers (64%) and large traders (23%) were the two key markets for Irish potatoes.

Key reasons cited by respondents who sold produce to brokers included poor road conditions which made it a bigger hustle for farmers to transport their produce, proximity of brokers to the farmers, emergencies which necessitated the farmers to source for money urgently and sale of produce for procurement inputs among other reasons.

A total of 6169 MT of assorted grains valued at 2,354,497 USD was traded facilitated by KACE and CGA against a target of 22,500 MT valued at 5,235,294 USD falling short by 55.2%. Various challenges experienced by farmers during the project implementation period and which contributed to reduced volumes traded included unfavourable weather conditions experienced in some of the project areas like Makueni, seed shortage experienced during the 2011 planting season as well as fertilizer shortage. The Maize Lethal Necrosis disease was also noted as a contributing factor to reduced yields particularly in Transnzoia. Late contracting and long procurement procedures by WFP were also cited to have lowered farmer's confidence with the structured market channels. As a result some farmers ended up selling their produce through unstructured channels.

1.3 Intermediate Result 3: Increased access to Business development Services

This indicator looked at four components namely: the number of business development services that were made available, the total number of SMEs accessing business development services, the total number of business service providers participating in the BDS program target areas and the number of SMEs receiving USG assistance to access credit. A total of 12 business development services were made available to farmers against a target of 8 (150%). The total number of Individual farmers who benefited from business development services like training on various modules in the Farming as a Family Business curriculum, market access, input supply, training and technical assistance, access to financing, infrastructure, new technology and product development were approximately 11,096. The total number of individuals in Small and Medium Enterprises (SMEs) who benefited from business development services either through training on Entrepreneurship and Business Planning, beneficiaries of VBAs advisory services , inputs and outputs, business links, loans records, ICT extension service users data, trained in new product development were approximately 2,219. Total number of business service providers participating in the BDS program in target areas was 165 against 100 targeted thus achieving 165%. The total number of SMEs receiving USG assistance to access credit (beneficiaries of bank loans, MFIs, youth enterprise funds, women enterprise fund, group revolving fund) was 14 against a KMDP target of 30 (thus achieving 47% of the target).

1.4 Intermediate Result 4: Increased Effectiveness of Farmer Organizations

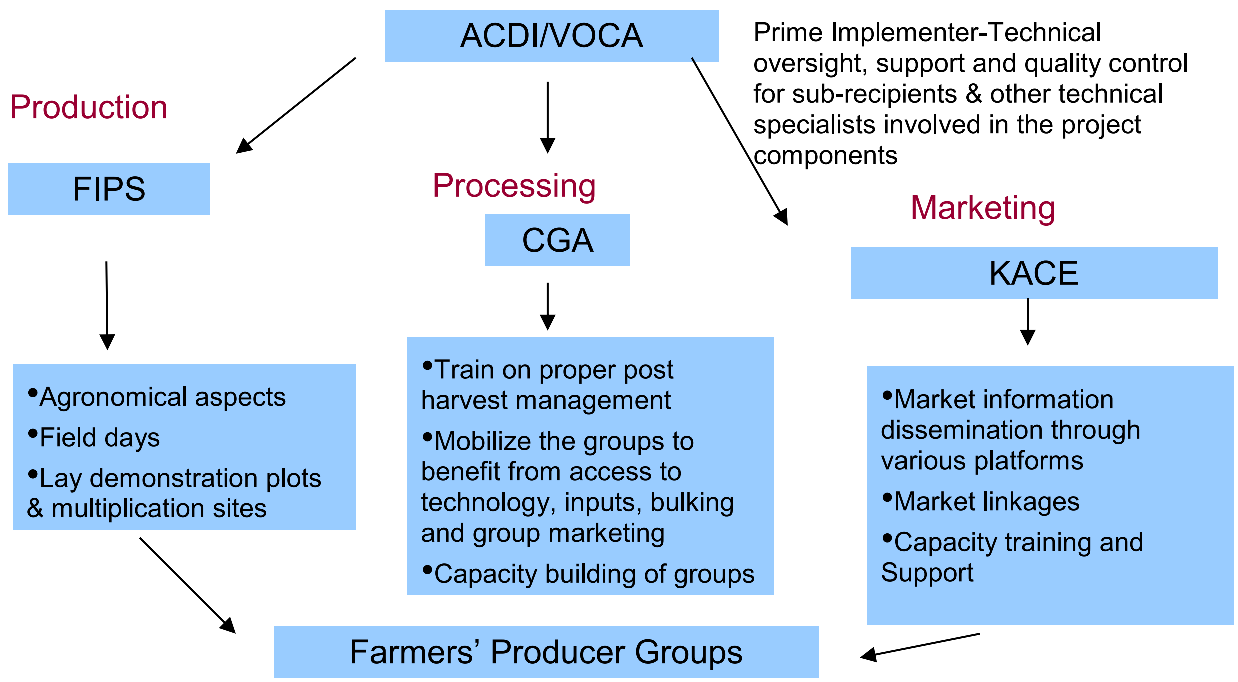
A total of 231 producer groups were trained on various elements of leadership, management skills and organizational development against a target of 60 groups. Thus the programme managed to greatly surpass the set target by 285%. The number of women organization associations who received USG assistance was 17 against a target of 5 (achieving 340% of the target).

Overall the project benefits were largely felt in the farmers' households with farmers expressing increased income and investment in new economic activities, improved livelihood where farmers reported they were able to clear their debts, enrol their children in good school (even private ones), supplement their diet by incorporating new foods introduced (cassava, sweet potatoes and vegetables) and even investment in property where some farmers were able to purchase land and motor bikes for business.

1.3 Design and Implementation of the Programme

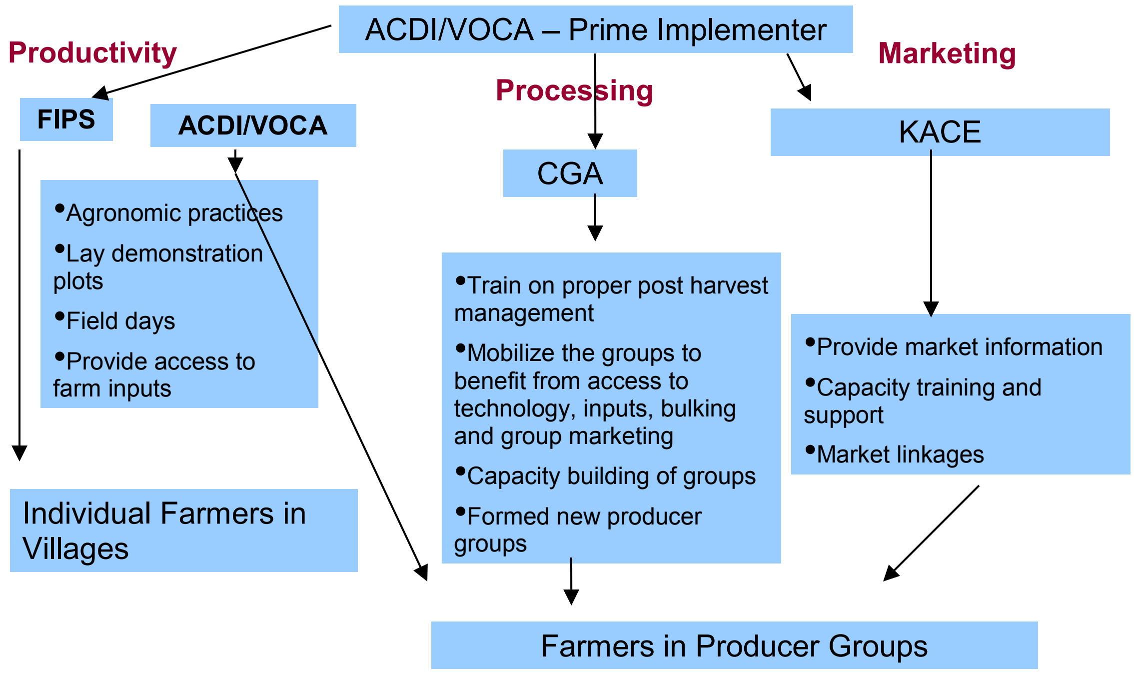
Intended Programme Design

The programme design was intended as a value chain project with ACDI/VOCA being the prime implementer offering technical support for sub-recipients and other stakeholders involved in the project components. FIPs would undertake the increased productivity element through field days, laying demonstration plots and generally providing agronomical elements of productivity. CGA would then undertake processing by mobilization of farmer groups, capacity building, and training on harvesting and post harvest handling. KACE would then deal with the marketing element by providing farmers with market information, market linkages and capacity training and support. All partners would target farmers through producer groups thus giving them the benefits of the value chain activities in a uniform manner.



Implemented programme design

However, there was deviation in the intended design with FIPs targeting farmers through a village approach where extension agents recruited from the villages (Village Based Advisors) were trained on productivity and were also supplied with small seed packs, vines and cuttings for demonstration to farmers. The rationale behind this approach was that it was more likely to reach a critical mass of farmers falling outside the producer groups and that the approach offered sustainability through the VBAs who would continue acting as resource persons even after the programme ended.



1.3.1 Extent to which the two approaches were complimentary in reaching a critical mass of small holder farmers

The village and producer groups were complimentary to a certain extent where synergies were experienced. This was evidenced through the strengths of each of the approaches and where partners using the different approaches were able to compliment efforts. In some cases there was involvement of each of the partners in activities targeting either the farmers through the village approach or through the producer group approach. This was achieved through earlier planning and where the partners were available in the locations where these groups/villages existed. The village approach had greater strength in reaching the masses while the producer groups approach had strength in organization. In some cases these levels of synergies were not achieved leaving the groups/farmers without the necessary knowledge.

1.3.2. Strong and weak points of the project partnership

Strong Points

a) Partnerships formed provided sustainability elements- The use of VBAs, Promoters TOTs was positive as these would provide a point of reference for the farmers after the programme came to a close

b) Over 20 private-public partnerships formed (formal and informal) leading to

- Increased demand for inputs by farmers
- Established linkages between the farmers and the stakeholders in production, processing & marketing- e.g EAGC, WFP,seed companies, Govt

Weak Points

- Challenges in communication between partners
- Uniformity in intended benefits of the value chain to farmers fragmented due to different approaches used

Challenges

- Challenges experienced during programme implementation were mainly budgetary

1.3.3 Extent and involvement and contribution of key stakeholders of the staples value chain

There were 5 value chain crops in the project- Maize, Beans, Cow Peas, Pigeon Peas & Tubers (Irish potatoes, Cassava, Sweet Potatoes. Overall the Maize & Beans value chain received input from all stakeholders in production, processing and marketing. There was less involvement in other value chains with either one or two of the partners involved but eventually missing out on one value chain process.

1.3.4 Efficiency and effectiveness of the implementation approaches

Although two different approaches (village and producer) were used during the program implementation, they can be said to be complementary since eventually they assisted to reach a critical mass of small holder farmers. However the difference in the approaches was in terms of the level of efficiency and effectiveness. The producer approach was more effective and efficient in procuring of inputs and marketing of produce since the group had bargaining power. Groups were also more effective in establishment of bulking points which helped to promote increased market access.

On the other hand, the village approach was more effective in providing knowledge since the farmer received individual attention from the VBA and therefore, his/her specific needs could be addressed. The approach also addressed the issue of sustainability since VBA are from the local community and therefore interested farmers can continue making consultation with the VBA even after the project cycle ends.

1.3.5 Extent to which gender and development was mainstreamed in project planning and implementation

Overall, the project was able to integrate gender in the project by creating a mechanism where women were given roles in decision making in the producer groups. It was also a requirement that a third of the beneficiaries were women. The project also prioritised the need to have representation of women during trainings; required gender disaggregating of information of benefits accrued to participants and sensitized the community in the importance of involvement of women in decision making. Youth were involved through recruitment as village based advisors/promoters and during training. The programme took on a deliberate approach to integrate the youth thereby empowering them with knowledge and skills. The youth were thus able to take advantage of the various opportunities within the value chain by becoming extension agents, middle men and also secured employment in agricultural sector organizations.

1.3.6 Sustainability of technologies

Farmers adopted most of the production technologies and were willing to use them in future. The farmers also indicated a high level of knowledge on the use of these technologies after training. In addition, farmers under the village approach have a reference mechanism under the VBA to seek assistance from on the technologies if need be. The VBA was already motivated to continue visiting the farmers on account of earning some form of income and was readily available in the village. On the other hand, farmers in producer group had also seen the benefit of use of these technologies and intended to use them. The only barrier to continued use was availability and price whose control was outside their reach.

There was low knowledge on the marketing technologies introduced. Further, there was also low intention to use the marketing technologies due to this lack of knowledge raising sustainability challenges. Further more, some of these technologies required internet use and penetration which was low in the target rural households and also required ICT knowledge which was also low. It is important to note that the more effective tool (Soko Hewani) went off air and would thus not benefit the farmer. In some counties (Transnzoia) increased demand for the products led to low adoption since there was no need for market information. This was a factor outside the programme’s control.

1.3.7 Farmers perception on technologies

Farmers were positive about the technologies introduced (mainly those in crop production) and intended to use them in future as they believed these technologies had increased their yields. They were however pessimistic about the use of fertilizer NPK, foliar feed and herbicides perceiving these inputs to be of no benefits and too expensive.

CHAPTER 1:
BACKGROUND

CHAPTER ONE: BACKGROUND

1.1 Introduction

The Kenya Maize Development Programme acknowledged that Maize dominated the staple diet of rural and urban Kenyan households occupying in excess of 50% of smallholder farming lands and also doubled up as a cash crop in many households. The sub sector had over the years witnessed massive investment by both the public and private sectors which had resulted in consistent improvements in maize production. Despite this Kenya had increasingly become a maize deficit nation. Faced with frequent droughts in the face of a growing population, Kenya's continued over reliance on maize at the expense of other viable staple crops such as sorghum, millet, sweet potatoes, irish potatoes, cassava, beans, pigeon peas, and green grams presenting a strategic error in efforts aimed at improving food security, and incomes of farming households. (KMDP II Baseline Survey Report 2011, p15).

Despite maize being the main staple crop in Kenya, literature reviewed in the baseline report indicated a reduction in consumption from 90kg per person in 2003 to 88kg in 2009. This reduction was a pointer to changes in the staple food sub sector with maize giving way to alternative staple crops such as potatoes, pulses and sorghum. Compared to maize, these alternative staples were more drought resistant and did well in Kenya's depleted soils with little fertilizer and with relatively lesser skill and knowledge. It is under this context of changing dietary patterns and unpredictable weather that USAID invested in the KMDP II programme to address supply chain inconsistencies, facilitate the development of alternative value chains and improve the position of small holder farmers in the staple sub sector in line with its strategic objective on improving rural household incomes, (KMDP II Baseline Survey Report 2011, p19)

1.2 Survey Objectives

The objectives of the performance evaluation were:

(iv) To measure the success (development effectiveness) of KMDP II project in reaching the desired objectives along the value chains (production, processing, marketing) given the design and implementation approach adopted by the project

(v) To generate lessons from the design and implementation process with an aim of sharing best practices forming the basis for updating standards and practices within the industry

(vi) To identify areas where KMDP II realized significant development results, and those where less success results were achieved and therefore need improvement.

The specific objectives of the evaluation were to:

1) Find out if the project design and implementation strategy were followed as expected and reasons for not following the design if any existed
2) Determine the extent to which the intended project benefits reached the households of producer organizations and changed lives.
3) Show the strong and weak points in the partnership of the project, and suggest the opportunities that exist to strengthen such partnership
4) Establish the extent of involvement and contribution of key stakeholders of each one of the staples value chain and suggest ways of making improvements.
5) Find out the extent to which gender and development was mainstreamed in project planning and implementation
6) Establish the efficiency and effectiveness of the implementation approaches used by the project
7) Determine if the technologies, marketing and management approaches promoted were sustainable and environmentally friendly

8) Establish farmers perception in relation to technologies promoted through KMDP II project

The end term evaluation targeted farmers' households (maize and other staple food farmers) in the project areas as below:

- Rift Valley- Uasin Gishu, Transnzoia, Nakuru, Bomet, Laikipia
- Bungoma
- Central- Nyandarua
- Machakos, Makueni,
- Nyanza- Siaya, Kisii/Nyamira

CHAPTER 2:
METHODOLOGY

CHAPTER TWO: Methodology

2.1 Introduction

This study was a descriptive cross-sectional study that made use of pluralistic research. This is a combination of literature review, quantitative and qualitative research methods in order to gain the advantages of both[1]. Quantitative data was collected using structured questionnaires. Qualitative interviews were conducted using semi-structured interview schedules and open ended ad hoc conversations and through the use of data collected through case studies. Literature review was conducted through a review of the KMDP II project documents.

2.11 Quantitative Research

Given the need to have a representative sample, a total of 853 interviews with targeted farmers and their households in the identified project areas was proposed based on calculations below taking care of the design effect (conventionally taken as 2) and a loss/ non response rate of 10%:

N = deff × Z2p (100 − p)/e2.

= (2*(1.96^2)*50(100-50))/(5^2)=768

After factoring a non-response of 10% the sample size;

N=768*100/(100-10%)=853

This sample would at 95% confidence level give a confidence interval of +5% (normally a sample of 385 at 95% confidence level offers a precision level of +5%). This was attributed to the sampling methodology for this survey which used clustering which normally provides less precision and thus the sample was doubled to provide a similar level of precision). The sample was distributed across farmers in both programme approaches i.e. village approach and producer group approach. This distribution would enable analysis that would bring out the strengths, weaknesses or synergy effects of each.

Sample Achieved by target area

Table 1: Sample Structure by target area

Target Area	Sample Achieved
Village Based Approach	
Bungoma	143
Makueni	76
Machakos	30
Siaya	68
Sub-Total	**317**
Producer Group Approach	
Nakuru	45
Bomet	51
Uasin Gishu	52

1 Hosany, S. 2008, Business Research Methods/Research Projects. Royal Holloway; University of London.

Transnzoia	46
Bungoma	140
Laikipia	34
Nyandarua	59
Kisii	73
Sub-Total	**500**
Targeted sample (includes 10% non-response)	**853**
Achieved sample	**817 (96%)**

2.2.1 Sampling

Two stage sampling was used in the selection of the farmers' households to be interviewed in the quantitative phase of the survey exercise. This involved dividing the entire population of farmers (in groups or villages using information provided) into clusters and a random sample selection was made from the clusters. In the first stage, the producer groups and villages (based on VBA names provided) under the KMDP II program were recruited through random selection. In stage two, farmer's households were selected randomly and farmers within these households interviewed.

2.3.1 Data collection tools and approaches

Four data collection tools were used as described below:
(1) Farmers Household questionnaire- This questionnaire was administered to the farmers and their households through face to face interviews. Both open ended and closed questions were incorporated in the questionnaire.

(2) Collaborators questionnaire- This questionnaire was administered to collaborators involved in the upstream and downstream end of the value chain and incorporated open ended and closed questions. A list of 22 collaborators with whom the program had been working with was provided. However, based on the need to obtain a higher representation in this category, information was sought from the project staff and other value chain actors with whom the programme had worked with and these respondents were interviewed. Personnel used as village based advisors and promoters were also interviewed based on their interaction with farmers during the program. A total of 51 interviews were conducted with this target group.

The respondent categories included:

Respondent Category	No interviewed
Village Based Advisors/Promoters	28
Agrochemical companies (seeds, fertilizers and other chemicals)	26
Small scale bulkers and commercial traders	7
Millers	6
Financial Institutions	2
Total	**51**

(3) Key Informant Interviews- Key informant interviews were used to obtain in-depth information on various aspects of the programme implementation. A total of **15** key informant interviews (KII's) were conducted as follows:

Key informant interviews conducted

Table 2: Key informant interviews conducted

Area		Respondent
Bungoma	ACDI/VOCA	Regional Coordinator-ACDI/VOCA
	West FM	West FM
Makueni	Village Based Advisor	VBA
	FIPS	Regional Coordinator Eastern
Machakos	ACDI/VOCA	Regional Coordinator Eastern
Siaya	Village Based Advisor	VBA

Laikipia	Producer Group Representative	Producer Group Representative
Uasin Gishu	ACDI/VOCA	Regional Coordinator
Transnzoia	Kenya Seed	Kenya Seed Manager
Nakuru	ACDI/VOCA	Project Staff
	Producer Group Representative	Producer Group Representative
Nairobi	FIPS	Project Staff
	KACE	Project Staff
	ACDI/VOCA	Project Staff
	CGA	Project Staff

Using a key informant discussion guide, a moderator guided the discussions with key stakeholders involved with the farmers under KMDP II in the target survey areas.

(4) Focus Group Discussions (FGDs) – In this case focus groups were composed of farmers in producer groups/villages selected outside those participating in the quantitative survey participation. Particular care was taken to disaggregate the groups by gender thus discussions were conducted with groups composed of either gender to ensure cultural issues were taken care of and thus facilitate free discussions. A minor challenge was however encountered due to inaccessibility of some farmers who carry out activities together. Thus it was at times difficult to gather the farmers in a single male or female group and meet the required quorum for discussion as was the case in Machakos. A mixed group was thus the only option; however, no limitations due to the mixture were experienced. In Siaya, the farmers targeted for the discussions were out on a church activity for the week and were expected back after the survey period.

A total of **7 focus group discussions** were conducted with the various farmers under the KMDP II programme.

Focus Groups conducted

Table 3: Focus Groups conducted

Area	Gender	Number of Focus Groups Conducted
Bungoma	Female –Producer Group Approach	1
	Male- Village Based Approach	1
Makueni	Female- Village Based Approach	1
Machakos	Mixed –Producer Group Approach	1
Siaya	Female- Village Based Approach	1
Transnzoia	Female- Producer Group Approach	1
Bomet	Male –Producer Group Approach	1
Total		**7**

Eight case studies were undertaken in the survey areas targeting farmers under the different approaches.

Case Studies Conducted

Area	Gender	Number of Focus Groups Conducted
Makueni	Village Based Approach	1
Machakos	Village Based Approach	1
Bungoma	Producer Group Approach	1
Bungoma	Village Based Approach	1
Siaya	Village Based Approach	1
Kisii	Producer Group Approach	1
Laikipia	Producer Group Approach	1
Uasin Gishu	Producer Based Approach	1
Total		**8**

2.4 Survey Execution

Timing of the survey:

The survey was conducted between 13th August and 24th August 2012. The survey was executed in four steps. The first step involved training of the field team where a two day training session was conducted with the interviewers. The second stage involved data collection in the project areas which were identified based on the producer group or VBA selected before the onset of the survey.

Data Collection Challenges

The process of data collection went on smoothly despite a few challenges. The main challenges encountered were due to the long distances where the producer groups and villages were found. Communication was also a challenge as most facilitators on the ground claimed not to be aware of the survey or had not had enough time to inform the farmers of the intended visits for questionnaire administration. Thus in some areas the expected quota was not met as was the case in Nakuru and Bomet. As mentioned earlier, because of this lack of information, some farmer groups had planned different activities during the survey period including church activities and other social setting meetings away from their villages. This led to delays in the completion of work planned for the defined period and in some cases as earlier mentioned a mixture of groups.

Data collection was followed by data entry. Double entry system was employed to ensure that the data entry was 100% verified, thoroughly checked and cleaned. This stage was then followed by data analysis which was done using QPS and SPSS software.

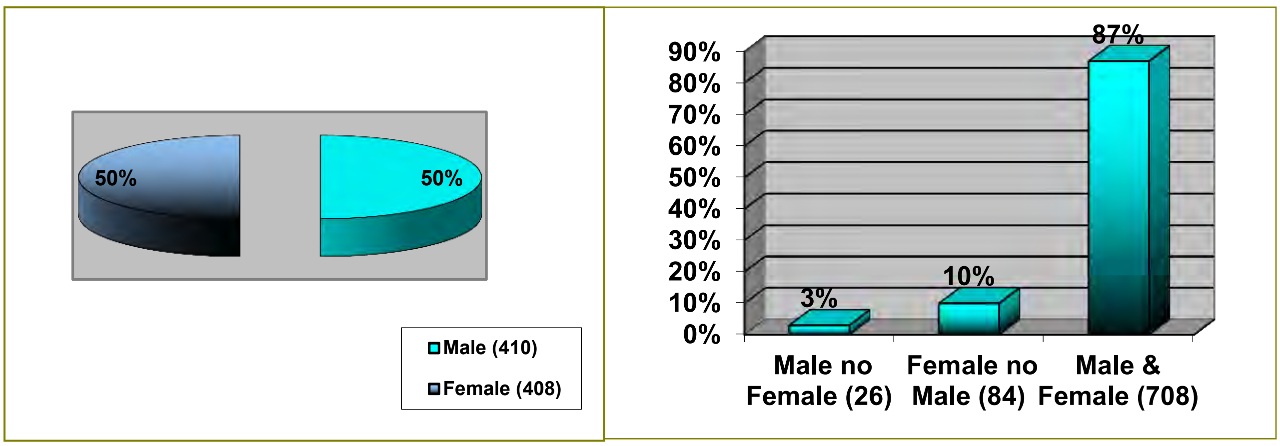
CHAPTER 3:
SURVEY FINDINGS

CHAPTER THREE: SURVEY FINDINGS

3.1 Sample Profile

There was an equal proportion for males and females interviewed. The majority of households surveyed were Male and Female households (M&F) with only 10% being those with female no male (FNM) and 3% under male no female type (MNF). The proportion of male headed households was also found to be similarly higher during the baseline period (79.5%). No Child Headed Households were found during the survey.

Figure 1: Gender Split& Household Typology



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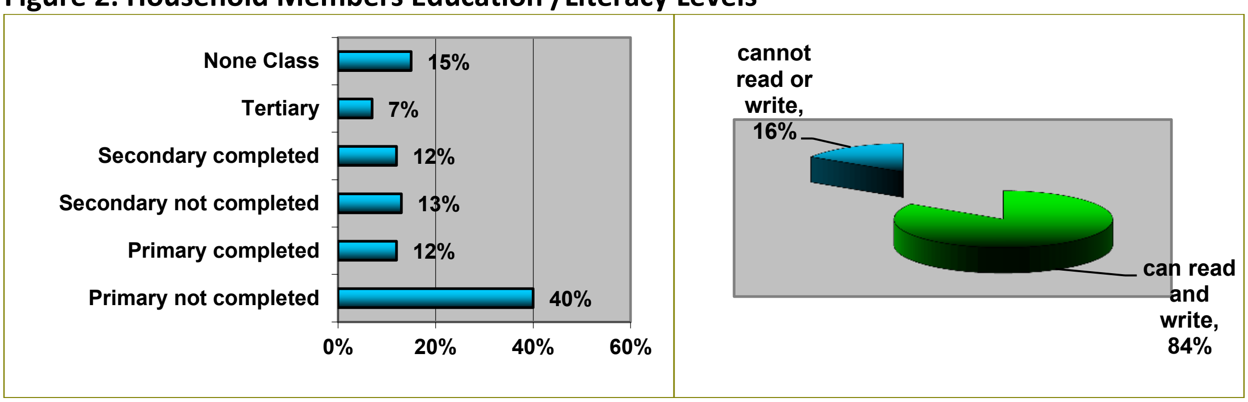
The education level of household members surveyed was mainly primary level (not completed) with only 7% attaining tertiary education and a further 15% having no education (this was limited to members of household 6 years and above). The figure below shows the majority (84%) of household members being literate (i.e. could read and write).

Figure 2: Household Members Education /Literacy Levels



3.2 Programme Implementation & Design

The programme design was intended as a value chain project with ACDI/VOCA being the prime implementer offering technical support for sub-recipients and other stakeholders involved in the project components. FIPs would undertake the increased productivity element through field days, laying demonstration plots and generally providing agronomical elements of productivity. CGA would then undertake processing by mobilization of farmer groups, capacity building, and training on harvesting and post harvest handling. KACE would then deal with the marketing element by providing farmers with market information, market linkages and capacity training and support. All partners would target farmers through producer groups thus giving them the benefits of the value chain activities in a uniform manner. It was anticipated that by involving all the relevant stakeholders along the individual value chains, the project would achieve the four Intermediate Results of:

1) Increased Productivity,
2) Increased Trade and Market Access,
3) Increased Access to Business Development Services and
4) Increased Effectiveness of Producer Organizations.

This would in turn enable the project reach the higher goal of Increased Rural Household Incomes.

However, there was deviation in the intended design with FIPs targeting farmers through a village approach where extension agents recruited from the villages (Village Based Advisors) were trained on productivity and were also supplied with small seed packs, vines and cuttings for demonstration to farmers. The rationale behind this approach was that it was more likely to reach a critical mass of farmers falling outside the producer groups and that the approach offered sustainability through the VBAs who would continue acting as resource persons even after the programme ended.

Therefore KMDP II used two strategies to reach selected communities in the project areas.
The first was through producer organizations (existing or formed where none existed before) in which members of the organizations were involved in the project activities. The producer group approach was used by ACDI/VOCA, KACE and CGA.

The second approach was the village approach where farmers residing within selected villages participated in the project activities. This approach was majorly used by FIPS working at the production level in the value chain.

A number of collaborating agencies/organizations were also involved in upgrading the staple crop value chain.
At the upstream end of the chain, the notable agencies from the private sector involved include:

i. Kenya Agricultural Research Institute (KARI),
ii. Kenya Plant Health Inspectorate Services (KEPHIS),
iii. Seed Companies,
iv. Agro-chemical Companies,
v. Fertilizer Distributors and Financial Institutions;
vi. Warehousing/Storage area of the chain focused on commercial traders (Lesiolo Grain Handlers), National Cereals Board (NCPB) and small scale grain bulkers at the producer group level.

At the downstream ends of the chain were:

i. Grain millers (Unga Millers, Mombasa Millers, Pembe, Kitale Millers and United Millers among others) and the
ii. Consumers.

At the downstream end of the value chain, the project encouraged farmers to use electronic market systems for the grains, including use of mobile phones SMS services and radio programs (SokoHewani) as well as linking them to key agencies such as World Food Program P4P initiative.

3.2.3 Strengths and Weaknesses of Programme approaches

Producer Group Approach

Strengths	Weaknesses
Effective for value chain objectives	Limited in number thus may leave out farmers not able to access or be in groups but would benefit from the programme
Stronger in their ability to access various services as groups e.g. loans, farm inputs, collective sales thus better prices etc	Likely to disintegrate if not strongly grounded
Ease of flow of information	At times objectives of the groups don't link with the programme objectives raising sustainability challenges
Easy to follow up with groups	
Creates a forum for farmers to share experiences and learn from each other	Dominant individuals in the group e.g. the official may cause other member to feel left out and thus reduce their level of ownership and contribution

Village Group Approach

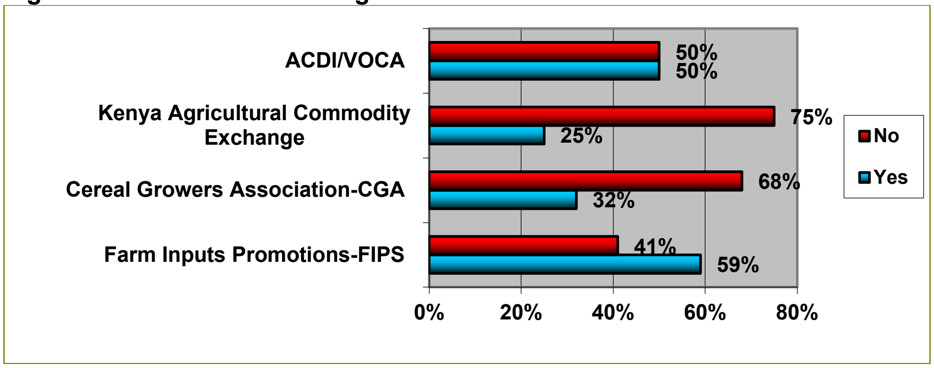
Strengths	Weaknesses
Able to reach the masses	Farmers not as cohesive as those in the producer groups
Better communication avenue for individual farmers	Farmers not able to enjoy the benefits of being in a group for accessibility of cheaper farm inputs, access to markets etc
Individual attention to farmers ensures their specific needs are met	Not easy to follow up on every individual and it would also requires a lot of resources
Sustainability - The VBA is from the local community, therefore even after the program ends farmers can still make consultations with the VBA	

3.2.4 Complimentary Level of the Two Approaches

Qualitative and quantitative research showed that there was some level of collaboration between the actors using the two approaches such that those using the village approach were still able to reach farmers in producer groups while those using the producer group approach were also able to reach some farmers under the village approach. In such cases, the two approaches were able to complement each other in terms of the strengths of each of the partners. In some cases, this level of collaboration was not reached and the effect is seen in the level of interaction between the actors and farmers as well as the level of information under each value chain activity reaching the farmers. Some of the reasons attributed to the lack of collaboration included the duration of the project and the fact that there was deviation from the design thus a fragmentation in the value chain process affecting effective planning and communication.

Respondents were asked if they had interacted with the various actors under the KMDP II programme.

Figure 3: Interaction with Programme Actors



More than half of the farmers interviewed had interacted with FIPs, 50% with ACDI/VOCA, 32% with CGA and 25% with KACE.

3.2.5 Efficiency and effectiveness of the implementation approaches used by the project

Challenges faced during the implementation of the project were mainly budgetary. While some partners felt they were not consulted earlier on their budgetary needs, others also felt the budget releases were not timely and thus affected implementation of their roles in the project. Communication between partners was also cited as a challenge where information flowed horizontally (between partners) and failed to be property disseminated vertically (i.e. to staff on the ground). The implementation process also failed at times to meet the needs of the farmers with some failing to attend meetings or trainings organised by the programme actors where the communication to the farmers was done late and the time organised was not convenient for the farmers.

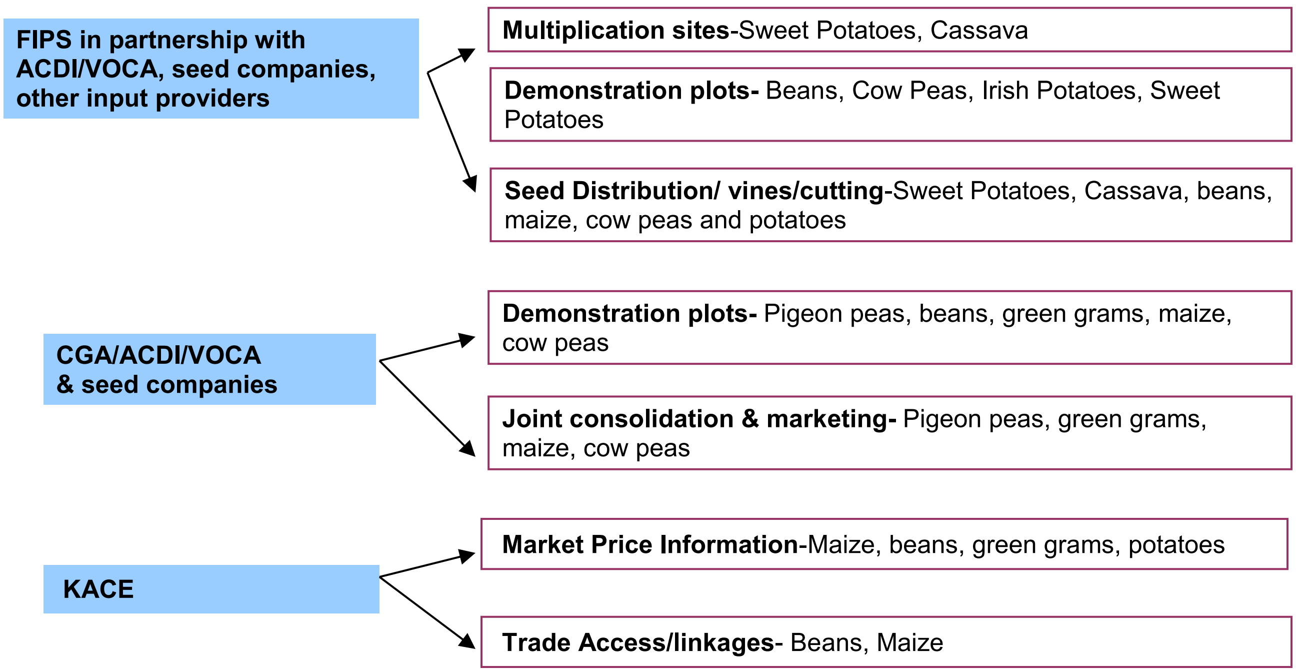
Other Approaches used in the Programme

a) Trainer of Trainer/VBA/Promoter Approach- This approach created efficiency in that the partners could reach more farmers while disseminating information and more economically through these actors. Once the TOTs, VBAs and Promoters were trained, the acted as extension agents providing knowledge and inputs to the farmers. They also became points contact for the farmers creating demand for knowledge and inputs thus raising sustainability of the activities promoted.
b) Value Chain – Efficiency of this approach was reduced due to fragmentation in the process of implementation of the value chain. Not all farmers were reached as envisioned through all value chain activities (production, processing and marketing). Also not all value chain crops benefited from the value chain activities (production, processing and marketing) as intended in the programme design.
c) Electronic Marketing - Information dissemination of marketing technologies encountered challenges as farmers reported low levels of knowledge in the technologies (20%) and low future intention use (32%). Further, these technologies required access to the necessary infrastructure at times not available in the rural areas.
d) Multi-technology Approach – The programme also used a multi-technology approach, not a single value chain approach by working with a wide range of different crops that were appropriate for the agro-ecological zone. This included grains, tubers, legumes, vegetables and fruit trees. The VBA were supported with small packs of seed of these crops (or cuttings). Farmers were then able to choose the crops that they were most interested in. Logic for the use of this technology was based on the understanding that:
   - Farmers had different interests and needs;
   - Men and women farmers tended to grow different crops;
   - Improved maize required a lot of inputs that poor farmers could not afford and that by helping them with other crops, they could raise the money to buy the inputs
   - Working with a range of inputs and services would give VBAs income throughout the year,
   - Finally, if farmers were successful with one technology, this would build their trust in the VBA and they were more likely to try a different technology (which they might not have considered earlier).

Extent of Involvements & Contribution of Key Stakeholders in Each of the Value Chains

There were 5 value chain crops in the project- Maize, Beans, Cow Peas, Pigeon Peas & Tubers (Irish potatoes, Cassava, Sweet Potatoes. Overall the Maize & Beans value chain received input from all stakeholders in production, processing and marketing. There was less involvement in other value chains with either one or two of the partners involved but eventually missing out on one value chain process. Improvements could be made by:

- Incorporating all value chain crops especially in all value chain activities by partners
- Clear focus by all partners in the value chains intended for the project to avoid deviations and thus maximum input into the value chains
- Proper follow up from the onset to ensure this is incorporated in quarter plans



Extent to which KMDP II project integrated other sector players (Private Public Partnerships)

The programme was able to integrate various sector players through collaborations during trainings, demonstrations, field days and other activities carried out within the programme. In particular, organisations in the financial sector, farm inputs supply sector (seed companies, fertilizer companies, agrochemical companies), line ministries and various stakeholders were involved. A total of 4 formal partnerships and 20 informal partnerships were established. A full description is provided in Annex 5. These partnerships were extended to the farmers and have thus created sustainability of the programme activities through increased demand for the services and products offered by these organisations.

Contribution of KMDP II Project to Feed the Future Programme

The programme was able to support farmers in the production of different staple crops which have been adopted by farmers. These foods became a source of food for household consumption for the farmers who didn't have to rely on expensive and less nutritious food. Sweet potatoes and cassava were for instance incorporated in breakfast meals for the families. In case studies done (see Annex 6), farmers were also able to start kitchen gardens which provided additional foods for the family providing readily available food. The foods introduced in the kitchen gardens were mainly vegetables and also acted as a source of nutrition. The VBA approach supported farmers rearing livestock by providing vaccination and other services. Some of these farm animals provided a supplementary diet for the family. Farmers interviewed were able to cite the impact the project had in their lives through the incorporation of various crops and improved farming methods. One of the benefits felt was increased yields and thus incomes. These farmers cited they

were now able to pay off their debts, invest in other businesses as well as provide for their families through food, education and other amenities.
"We have found farmers who are hungry and never have enough to eat and now they have enough…"

"We have done impact assessments in other areas and I have been to KMDP areas and seen similar, within a year and a half to two years we normally find adoption to sweet potatoes and cassava so between sixty percent and a hundred percent of households in the target villages"

3.3 Success of the KMDP II programme in reaching the desired objectives along the value chains

3.3.1: Intermediate result 1: Increased productivity of staples crops in target areas

This component prioritized activities to improve per unit area production whilst reducing production costs. This was done through provision of technical assistance to small holder farmers, training to increase on-farm per unit productivity, reduce production costs, and improve the quality of maize and alternate staple crops which was done through collaboration with private sector partners.

Number of individuals who have received USG supported short-term agricultural sector productivity training

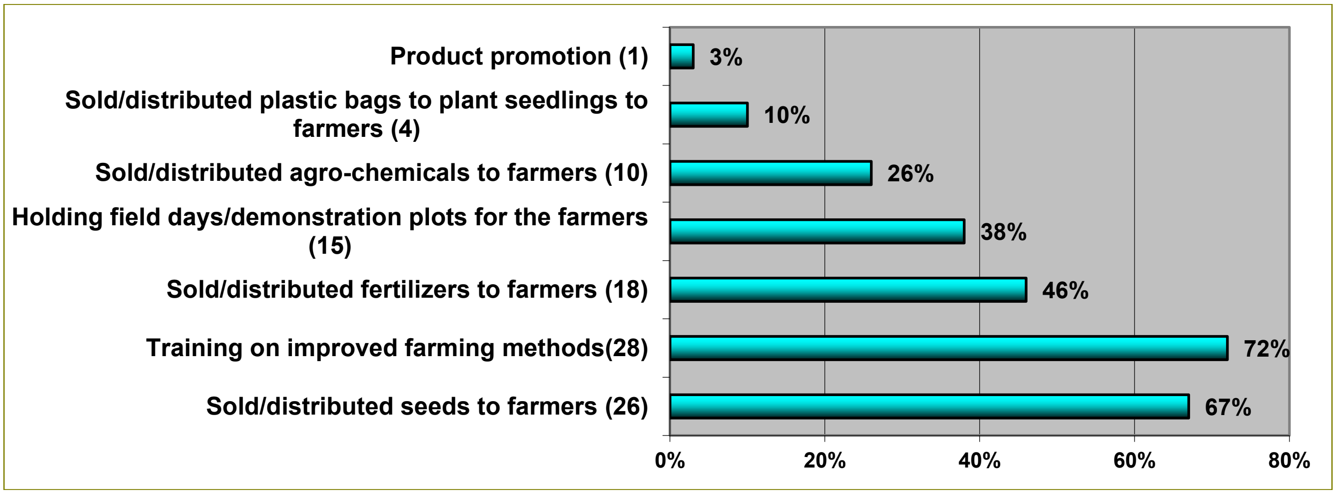
FIPS used various strategies to reach out to a large number of farmers. Village Based Advisors (VBAs) were recruited by FIPS Africa and equipped with training and inputs to ensure technology transfer reached the targeted farmers. Their goal was to promote the appropriate seeds, fertilizers and other inputs. They also generated income from their services to develop a sustainable private sector led extension service. VBAs recruited and trained sub VBAs to assist them. The sub-VBAs were offered the opportunity to generate income from sale of disease-free sweet potato vines harvested from farmer multiplication sites. In order to reach a large number of farmers, the seeds were repackaged and distributed in smaller packs which the farmers would use in their learning plots which were of relatively smaller size too. The VBAs also organized field days which they used to educate the farmers around the demonstrations. Through the VBAs, farmers were trained on agronomy, record keeping, and enterprise development. To encourage small scale vegetable production, seeds (butternut squash, grain amaranth, collards and cowpeas) were procured, repackaged and distributed to the VBAs. A total of 31,850 small packs were distributed to farmers, 6,073 sweet potato and 7,259 cassava bulking sites established and 4,474 sweet potato vines distributed. A total of 12,433 households were reached through small seed pack distribution.

CGA conducted awareness training in all the three regions (Makueni, Transnzoia and Bungoma) to sensitize farmers on joint marketing and equip them with skills on post harvest handling. Farmers households also received training on post harvest handling, storage and mangement. Topics covered included pest control, store management, causes and management of aflatoxins. (See Annex 1)
KACE provided training to farmers which touched on markets and marketing, explaining KMDP and KACE to farmers, access and use of the KACE market information system through demonstration and distribution of promotional and training materials to farmers.

During the programme implementation period, FIPS held 13,902 field days, KACE held 2,500 CGA 4,887 and ACDI/VOCA 6,231 field days. Overall 27,520 field days were held by the consortium partners. Total number of farmers trained was 23,177 with 12,902 trained under FIPS, 1448 by CGA, KACE 2,596 and ACDI/VOCA 6,231. Demonstration plots established were 22,978 with FIPS establishing 22,969 and CGA 9. During the KMDP II programme implementation period a total of 123 VBA's were trained.

Quantitative research confirmed that the farmers were provided with an array of services by collaborators of the program in the value chain. The collaborators interviewed indicated that farmers had benefited most from training on improved farming methods; provision of seeds either through sale for use or supply of the seeds from promotion. Other services include the sale or distribution of fertiliser and demonstration plots and field days.

Figure 4: Services provided to farmers under the programme

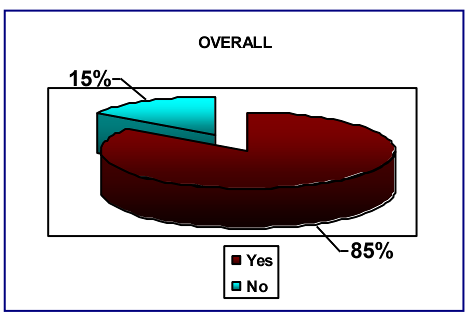


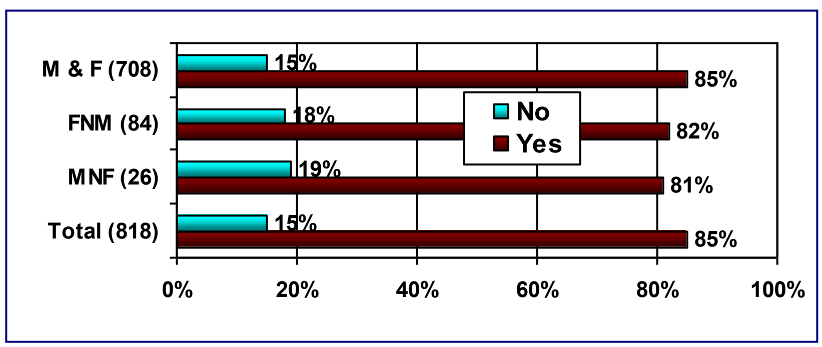
Prior to the KMDP II intervention, farmers indicated use of various farming technologies with majority making use of fertilizer application and improved seed varieties (stated by over 70% of the farmers. Use of other technologies was however low, falling below 50%. They included natural resource management, post harvest handling of farm produce, market access technologies amongst others as shown in the figure below. There was an almost equal gender balance in the use of these technologies.

Training Received by Farmers

Overall 85% of farmers surveyed had received some form of training under the programme. Slightly more farmers under male and female households had received training.

Figure 5: Proportion of farmers who received training





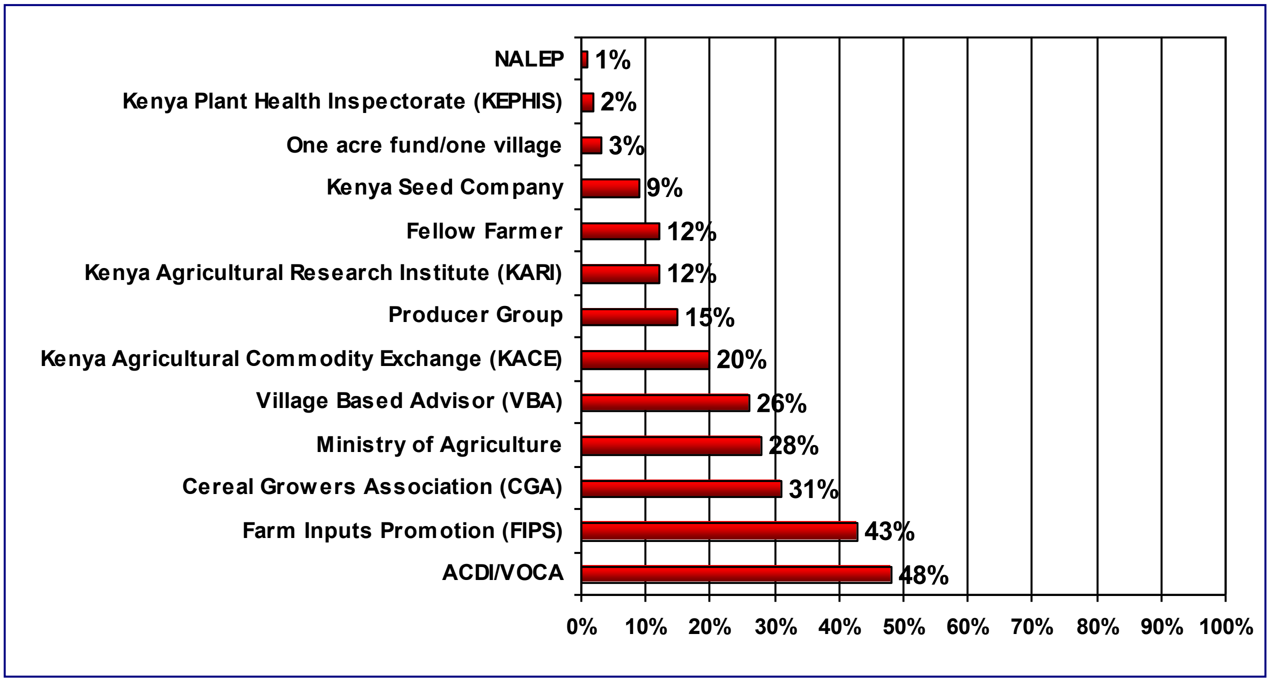
Household members receiving training were mainly the household heads (68%) and the wives of household heads 50%.

Table 4: Household members receiving training

	Total
Household head	68%
Wife of household head	50%
Husband of household head	2%
Son	5%
Daughter	4%

Training for the farmers was provided by a wide range of stakeholders showing a high level of involvement of various stakeholders including the private sector in the programme. The highest proportion of farmers however received their training from ACDI/VOCA and FIPs. Other trainers included CGA, Ministry of Agriculture, VBAs, KACE, among others.

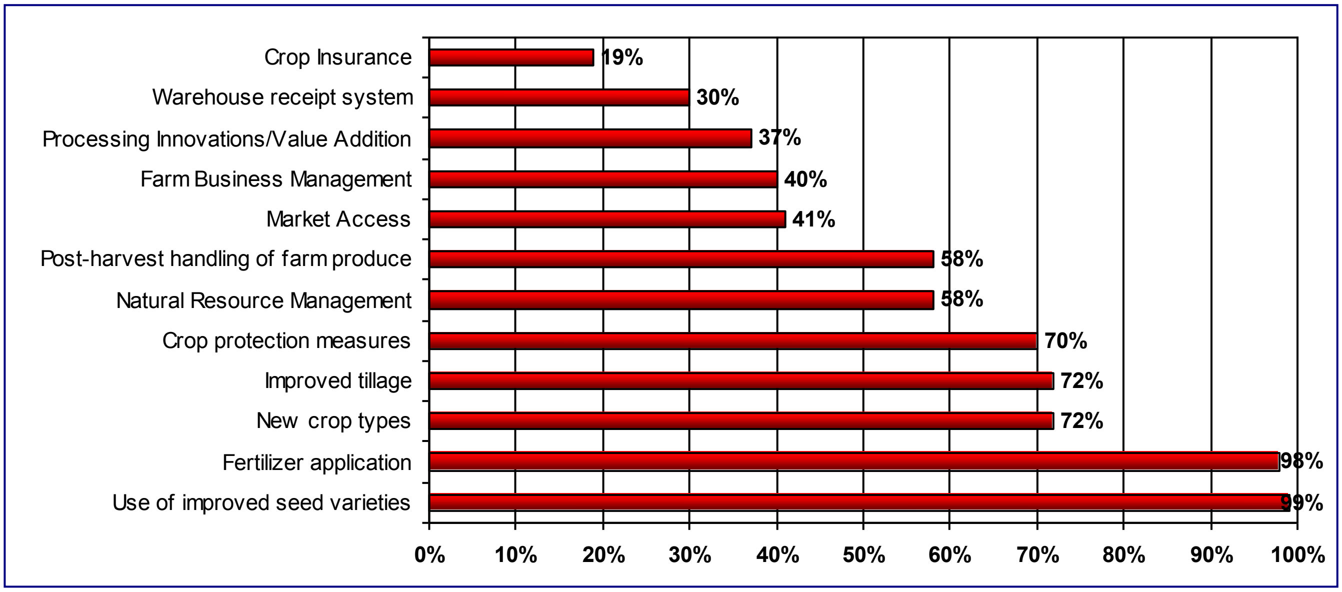
Figure 6: Trainer Description



Areas of training

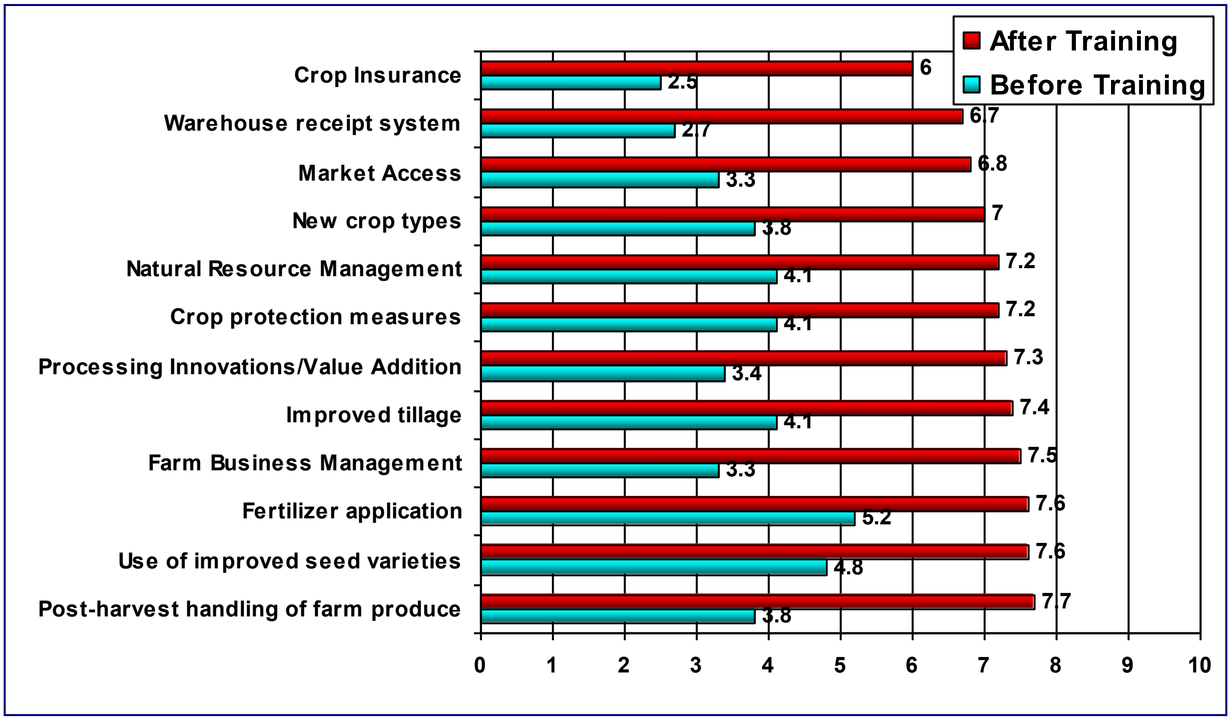
Farmers received training on various items; the majority however received training on the use of improved seed varieties, fertilizer application, new crop types, improved tillage, crop protection measures, natural resource management and post harvest handling. Training in market access, farm business management, processing innovations, warehouse receipt system and crop insurance fell below 50%.

Figure 7: Areas in which farmers received training



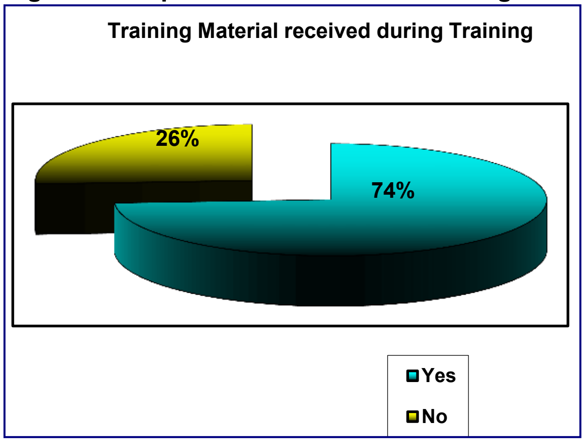
A comparison of farmers' knowledge on the various technologies before and after the training shows there was a high level of impact of the training on farmers. Farmers' level of knowledge in post harvest handling increased by 39%, 28% in the use of improved seeds, 24% in fertilizer application, 42% in farm business management, 33% in improved tillage, 39% in processing innovations, 31% in crop protection measures, 31% in natural resource management, 32% in new crop types, 35% in market access, 40% in warehouse receipt system and 35% in crop insurance. It is worth noting that this increase in knowledge was for farmers who had received the specific trainings. Increase in knowledge in market access, warehouse receipt system and crop insurance was lower than that in other farming aspects.

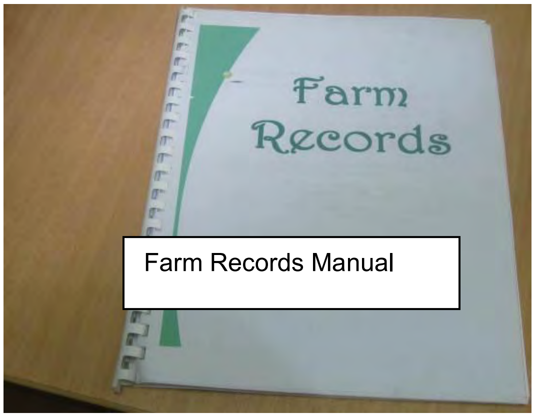
Figure 8: Level of knowledge gained on technologies after training

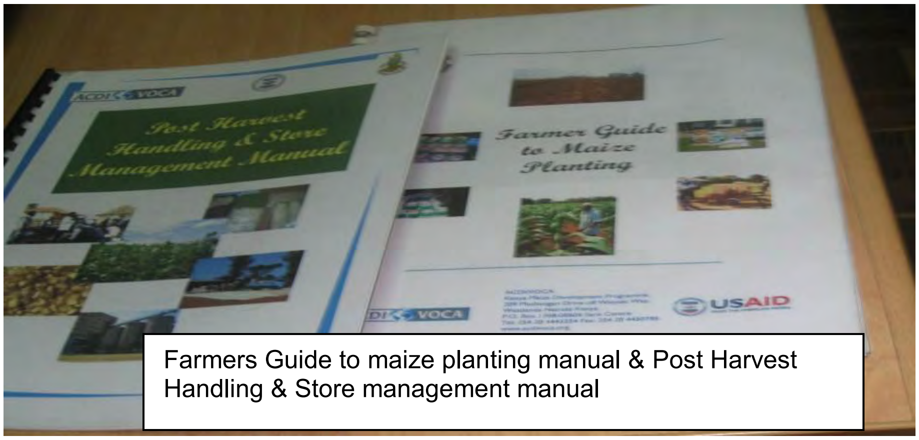


In terms of training materials, 74% of the farmers indicated they had received education materials. This was higher for farmers in Kisii, Laikipia and Bomet and lowest for farmers in Makueni. Handbooks, brochures and magazines were received by the farmers.

Figure 9: Proportion of Farmers Receiving Training Material







Farmers Guide to maize planting manual & Post Harvest Handling & Store management manual

3.3.1.2 Crop Production

The overall acreage for maize and pigeon peas was highest at 2.2 acres followed by beans 2 acres and green grams and cassava 1.9 acres. Crop production area for maize was highest in Uasin Gishu (4.7 acres) while the least was in Siaya (0.8 acres). Highest crop production area for beans was in Laikipia and the least in Siaya and Kisii while that for green grams was highest in Makueni (3.2 acres). Makueni also had the highest acreage for cow peas (2.8) while Machakos had the highest for pigeon peas (3.3). Laikipia also had the highest acreage under Irish potato production. MNF households had a higher area under maize production (3.3 acres) compared to FNF households (see table below).

Table 5: Acreage under each crop

	Maize	Base	Beans	Base	Green Grams	Base	Cow Peas	Base
Machakos	2	30	2.9	13	0.5	1	1.7	6
Makueni	2.1	69	2.1	32	3.2	13	2.8	2.8
Bungoma	1.3	277	1.4	210	-	-	-	-
Siaya	0.8	60	0.8	43	-	-	1	1
Kisii	2.3	72	0.9	31	-	-	-	-
Nyandarua	1.6	57	2.4	18	2	2	-	-
Uasin Gishu	4.7	48	2.2	9	-	-	-	-
Transnzoia	2.6	45	2.4	24	-	-	-	-
Nakuru	1.6	39	1.7	32	-	-	1.4	2
Bomet	1.1	45	1.2	29	-	-	0.3	1
Laikipia	4	33	4.3	18	-	-	-	-
Male No Female Household	3.3	26	1.7	19	-	-	-	-
Female No Male Household	1.6	77	1.6	59	-	-	-	-
Male & Female Household	1.9	665	1.6	459	-	-	-	-
Average Acreage	**2.2**		**2**		**1.9**		**1.4**	

	Pigeon Peas	Sample	Sweet Potatoes	Sample	Irish Potatoes	Sample	Cassava	Sample
Machakos	3.3	5	2.5	2	-	-	4.7	3
Makueni	2.3	16	2.9	5	2	1	2.2	8
Bungoma	2	1	1	4	-		0.9	3
Siaya	-	-	0.8	7	0.5	1	0.8	11
Kisii	-	-	0.8	2	-	-	1	1
Nyandarua	1.2	8	-	-	0.8	5	-	-
Uasin Gishu	-	-	-	-	0.1	1	-	-
Transnzoia	-	-	1.5	1	-	-	-	-
Nakuru	-	-	-	-	1.8	6	-	-
Bomet	-	-	1.3	2	1.5	2	-	-
Laikipia	10	1	-	-	4.8	3	-	-
Average Acreage	**2.2**		**1.5**		**1.6**		**1.9**	

The main benefit for the farmers of the crops they had incorporated was that they were food for family consumption. This benefit was key to farmers as well as for the programmes' objective in creating food security for the farmers' households. These crop types were also drought resistant, profitable and had high yields.

Table 6: Benefit of crops to farmers

	Benefit of crops to farmers	Cassava	Sweet Potatoes	Irish Potatoes
1	Food for family consumption	29%	33%	45%
2	Drought Resistant	23%	10%	-
3	High Yields	22%	14%	27%
4	Ready Market	8%	9%	6%
5	Profitable/less inputs required	9%	13%	12%

3.3.1.3 Adoption of Technologies

Perceptions on production technologies

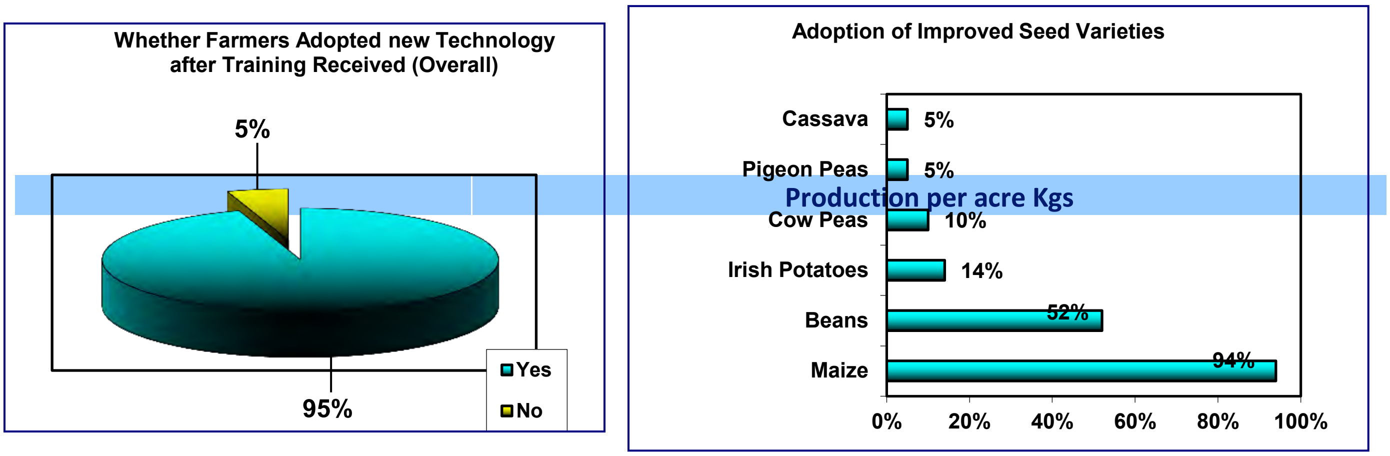
Discussions with the farmers revealed that the farmers felt they were now well trained on how to prepare their farms before planting their crops, during planting, cultivation, harvesting, storage and marketing. They had also learnt the proper application of manure and fertilizer on their crops. This had been done collectively by MOA, KMDP II and other collaborating organizations. "***Helped open our eyes and now we are able to produce enough for our families and have surplus for selling."*** The farmers had also been empowered to maximize their yields by having two seasons in a year. They had also been trained on what to plant during the short rains and what to plant during the long rains. ***"We are now having two seasons….. We used to plant maize for only one season and the rest of the time the farm stays idle as we wait for the next year to plant maize again."***

The farmers had also benefited because they had become busy and even the farms were not lying idle. They had also fought off starvation due to diversification of farming." ***If you fail to benefit from your maize harvest you can still benefit from your tomatoes, vegetables, bananas or coffee as all these crops are contributing a little money for you to meet your needs.."***

There was a high level of adoption of the various technologies in which farmers were trained with 95% of the farmers stating they had used the farming technologies trained on in their farms.

Figure 8 below shows high adoption on the use of improved seeds on the maize crop by farmers.
Use of Improved seed varieties

Figure 10: Adoption of Improved Seed Varieties by crop types



Crop Yields for the last Main Cropping Season
The average maize yields per acre were 11.6 90 kg bags per acre which was slightly lower than that recorded during the baseline (12.5 bags). There were generally increase in yields for most of the areas except Siaya. Maize crop yields increased for Bungoma whose average yield was 911 kgs per acre during the baseline and now recorded 1,329 kgs, yield for Makueni increased from 357 kgs per acre to 453 kgs, 1,191 kgs in Nakuru to 1,238, 1,508 kgs in Transnzoia to 1,491 and 1,572 in Uasin Gishu to 1,647. It should be noted that some of the districts covered during this evaluation were not covered during the baseline (Nyandarua, Laikipia, Bomet, Machakos and Kisii).

Table 7: Crop Yields for the last main cropping season

Main Crop	Beans	Maize
Machakos	381	377
Makueni	445	453
Siaya	231	476
Kisii	615	1150
Nyandarua	428	1193
Uasin Gishu	356	1647
Transnzoia	478	1491
Nakuru	496	1238
Bomet	138	648
Laikipia	194	1409
Bungoma	693	1329
90 kg bag /acre	**4.5**	**11**
Kgs/per acre	**405**	**1046**
Tonnes	**0.405**	**1.046**
Baseline	**0.232**	**1.124**

	Production Per Acre in Tonnes by Household Typology					
	Male No Female	**Base**	**Female No Male**	**Base**	**Male & Female**	**Base**
Maize	0.914 tonnes	26	1.028	77	1.154	665
Beans	0.295 tonnes	19	0.415	59	0.520	459

NB: It was not possible to calculate yields for some of the crops due to the small samples of farmers giving full information on these crops

Table 8: Yields By Household Typology

Yields for both maize and beans was higher for Male & Female households at 1.154 tonnes per acre for maize and 0.520 tonnes per acre for beans. This is in comparison to the Female No Male households with yields of 1.028 tonnes for maize and 0.415 tonnes per acre for beans. The Male no Female households showed much lower yields. However, there was a significantly smaller number of Male No Female households sampled. In this case a sample of less than 30 may not provide the actual yields representing these type of households.

An average of 12 bags was harvested for farmers who sold their produce with the highest number being in Uasin Gishu and Transnzoia. The average number of bags sold was 8.8; where post harvest loss was not incurred; it can be assumed farmers' households were able to consume produce not sold. Regions selling the highest number of bags were Uasin Gishu, Laikipia, Transnzoia and Bungoma. The gross margin for maize farmers was Ksh 21,910 up from Ksh 10,373 during the baseline. This increase could mainly be attributed to higher prices at which farmers had sold their harvests in the last cropping year. The average price for a 90 kg bag of maize was 2,671 compared to 1,575 at the baseline. There were variations in price in the regions with Nakuru, Machakos and Kisii experiencing high prices. It should be noted that Kisii has the third highest gross margin. Lower prices were experienced in Makueni and Siaya which also recorded lower gross margin.

Table 9: Gross Margins for Maize by Region

Maize gross Margins						
	Harvest per Acre	Sale Per Acre	Price per 90 kg bag(Ksh)	Gross margin (Ksh/Acre	Gross Margin Baseline	Price at Baseline
Machakos	5.1	3.2	**3,429**	10,356	-	
Makueni	5	2.7	1,490	3284	1,374	1,251
Bungoma	15	15	3,043	**42,385**	7,077	1,809
Siaya	4.8	4.4	1,660	6,464	5,280	1,719
Kisii	13	10.3	**3,308**	31,379	-	-
Nyandarua	13	10	2,379	21,102	-	-
Uasin Gishu	18	17	2,669	**39,853**	14,623	1,449
Transnzoia	17	11	2,566	24,676	12,644	1,404
Nakuru	14	9	**3,509**	28,744	11,691	1,818
Bomet	8.4	2.7	2,848	6,826	-	-
Laikipia	16	12	2,479	25,950	-	-
Average	**12**	**8.8**	**2,671**	**21,910**	**10,373**	**1,575**

An average of 3.8 90 kg bags of beans were harvested by farmers who sold their produce the highest being in Kisii (11 90 kg bags) and the lowest in Makueni (1.1), Bomet and Laikipia. The average number of bags sold was 3, with farmers in Kisii selling the most (10 bags) and those in Bomet selling the least (0.7). Price variations for beans were recorded with regions such as Machakos and Kisii recording very high prices. The average price for a 90 kg bag of beans was 3,849 which was slightly higher than that recorded during the baseline (3,258).

Table 10: Gross Margin for Beans by regions

Beans Gross Margin							
	Harvest	Sale	Price per 90 kg bag	Cost per 90Kg	Gross margin per acre	Baseline Gross Margin	Baseline Price
Machakos	2	1.7	**6,223.3**	118	10,379	-	-
Makueni	1.1	1	2,275.5	84	2,191	2,570	2,826
Bungoma	4	2.9	**4,285.9**	137	12,032	8,365	3,348
Siaya	6.3	5	1,387.5	155	6,161	2,084	3,618
Kisii	**11**	10	**5,652**	319	53,331	-	-
Nyandarua	3.8	2.8	**4,23**3	108	11,549	-	-
Uasin Gishu	5.2	3.6	3,509.3	200	11,915	13,309	4,158
Transnzoia	2.6	2	**4,523.7**	207	8,633	4,614	3,231
Bomet	1.3	0.7	2,041.7	205	1,286	-	-
Laikipia	1.5	0.9	4,088.2	164	3,532	-	-
Average	**3.8**	**3**	**3,849**	**174**	**11,854**		**3,258**

						13,750	

Table 11: Gross Margins by Household Typology

	Maize Gross Margins Ksh						
	Harvest per Acre	Sales per acre	Price per 90 kg bag	Costs per acre	Cost per bag		Gross Margin
MNF	8	1.8	2,733	20,695	230	2,503	4,505
FNM	20	8.8	2,554	26,635	296	2,258	19,870
M & F	16	8.4	3,177	31,149	346	2,831	23,780
	Beans gross Margins						
	Harvest per Acre	Sale Per Acre	Price per 90 kg bag	Costs per acre	Cost Per 90 kg bag	Margin	Gross Margin
MNF	3.5	2.9	3,946	13,507	150	3,795	11,007
FNM	3.8	2.5	2,875	14,415	160	2,715	6,787
M & F	3.8	2.5	4,586	17,550	195	4,391	10,978

There was a high intention of farmers to continue using the various farm inputs as shown in the table below. Of note was that farmers were less willing to use NPK fertilizer, foliar feed and herbicides in future cropping years.

Table 12: Future intention to use various farm inputs

Type of farm inputs/services used	Yes	No	**Type of farm inputs/services used**	Yes	No
Ploughing	98%	2%	Fertilizer Manure	63%	37%
Harrowing	64%	36%	Foliar Feed	42%	**58%**
Improved seed	98%	2%	Weeding	96%	4%
Saved seed	55%	**45%**	Pesticides	66%	34%
Planting	99%	1%	Soil conservation structures	69%	31%
Fertilizer DAP	87%	13%	Herbicides	40%	**60%**
Fertilizer NPK	22%	**78%**	Gunny Bags	71%	29%
Fertilizer CAN	58%	42%	Post-Harvest Chemical e.g. Actellic Super	67%	33%
Fertilizer Urea	29%	71%	Harvesting Costs	84%	16%

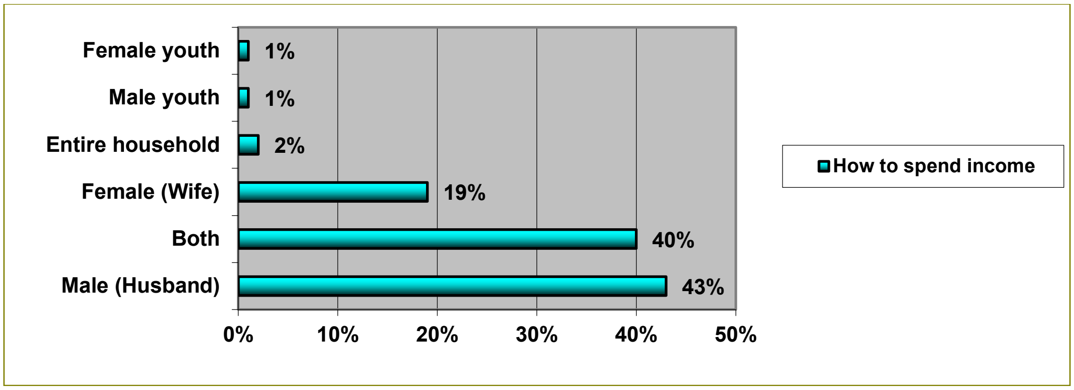
The farmers had encountered various challenges with regard to the use of inputs. Their main challenge was lack of income to purchase the good seeds or even to purchase the farm inputs. Some also lacked knowledge on the proper use of some of the inputs. The farmers also experienced challenges in obtaining quality seeds. Some had purchased low quality seeds from the shops and lost the crop thus experiencing food shortage.

3.3.2.2 Decision Making in Crop Production in the Household

Discussions with the farmers (both qualitative and quantitative) revealed that men made major decisions in the family like where to cultivate and what to plant and they were mainly the ones who purchased the farm inputs. Women on the other hand helped in the farm cultivation, did commercial tilling so that they are able to supplement for household income and would also be involved in making some of the decisions related to the household.

Decision Making in the Household

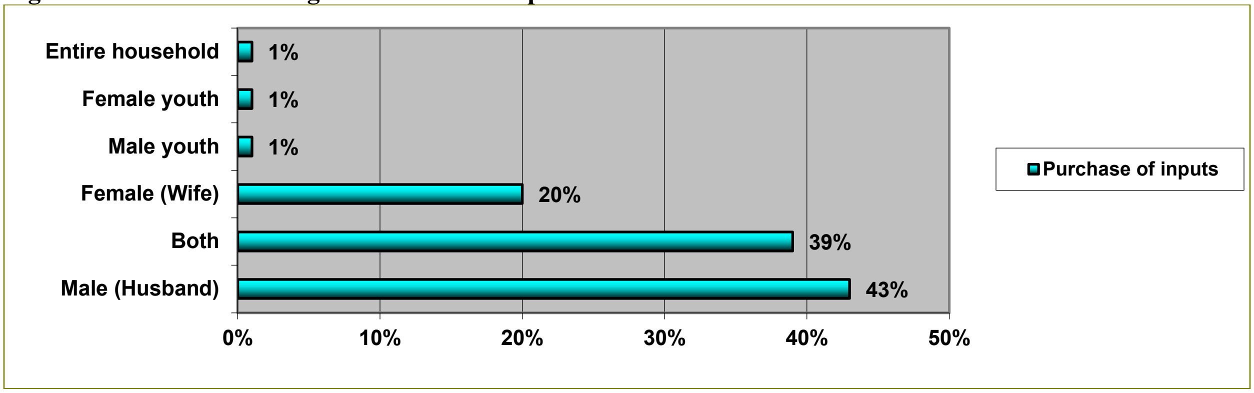
Figure 11: Decision Making on How to Spend Income



Though both the husband and wife were involved in making decisions on how to spend income in 40% of the households, the male was more involved in 43% of households

Decisions on the purchase of inputs were also mainly done by the male. As reported in the earlier section, the male (husband) mainly purchased farm inputs (seeds, fertilisers).

Figure 12: Decision Making on Purchase of Inputs



Decisions on the sale of outputs were largely done by both the husband and wife by 44% of the households and by the male (husband) in 35% of the households.

Figure 13: Decision Making- Sale of Outputs

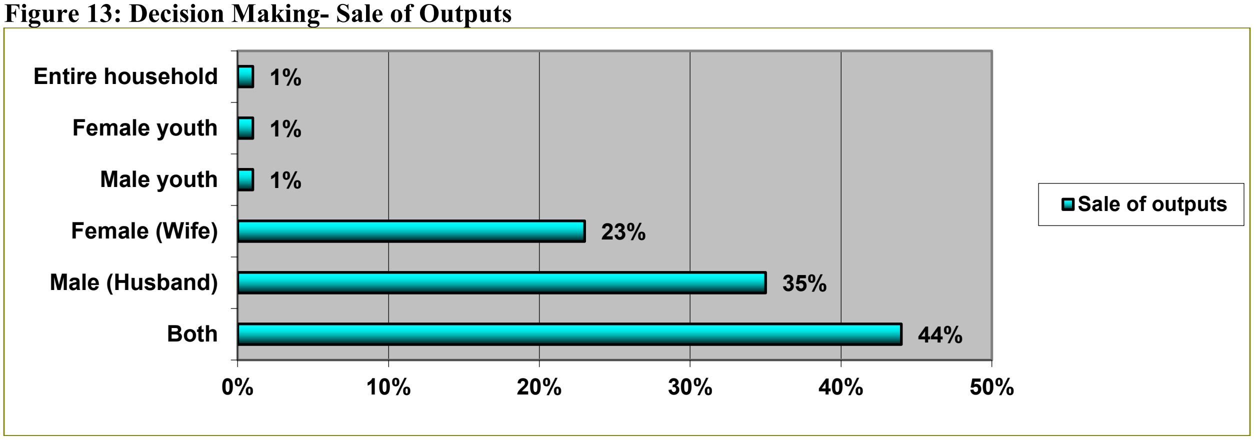
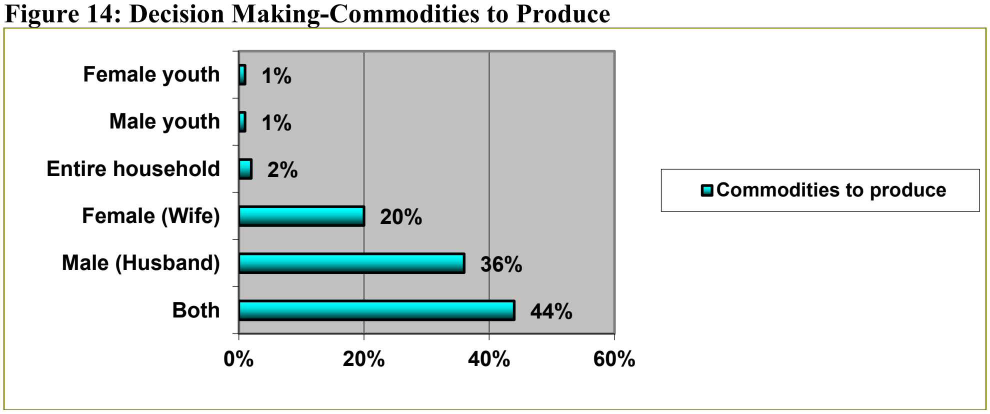


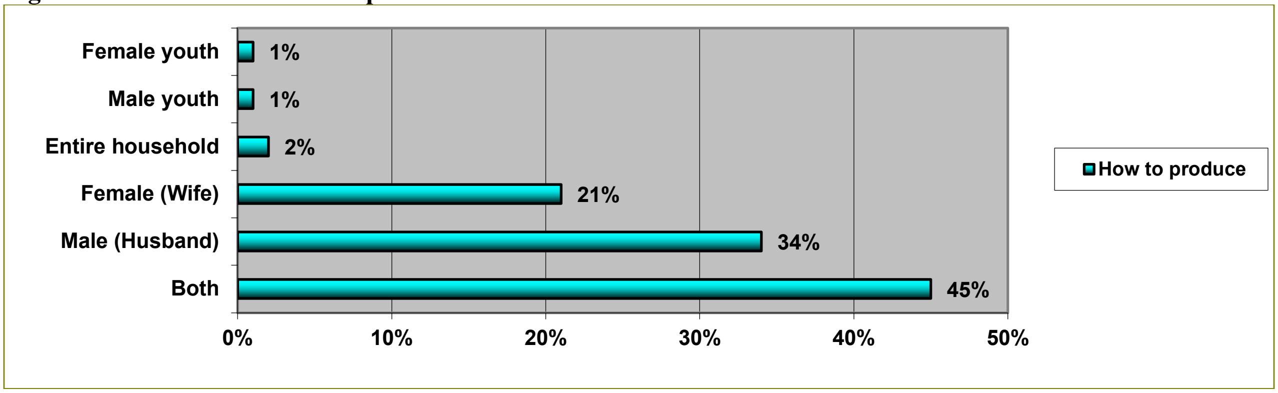
Figure 14: Decision Making-Commodities to Produce



Decisions on which commodities to produce on the farm were also largely made by both the male and female (44% of households). More males (36%) than females (20%) also made this decision.

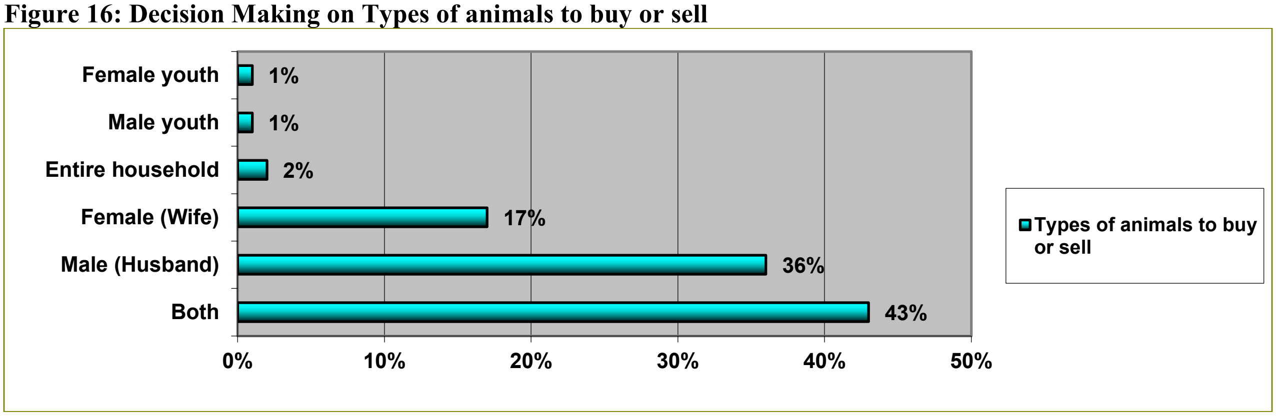
Both the male and females in the household (husband and wife) decided on how to produce in their farm (45% of households)

Figure 15: Decisions on How to produce



Decisions on the types of animals to buy or sell were made by both the male (husband) and female (wife). In more than a third of the households however, this decision was made by the male (husband).

Figure 16: Decision Making on Types of animals to buy or sell



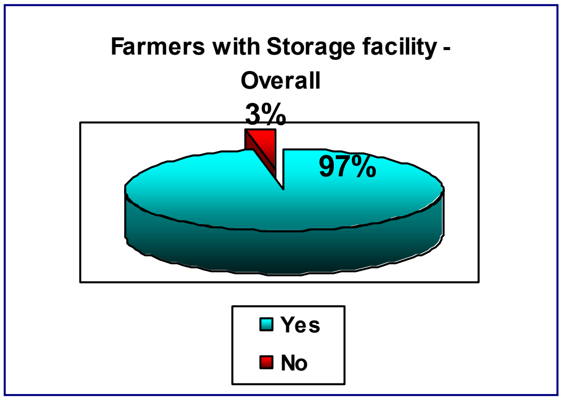
3.3.1.4 Storage & Post Harvest Loss

Almost all the farmers indicated they had a store for their harvests. The most used form of storage was a room in the house (23%) followed by traditional stores (11%).

Table 13: Type of Storage used

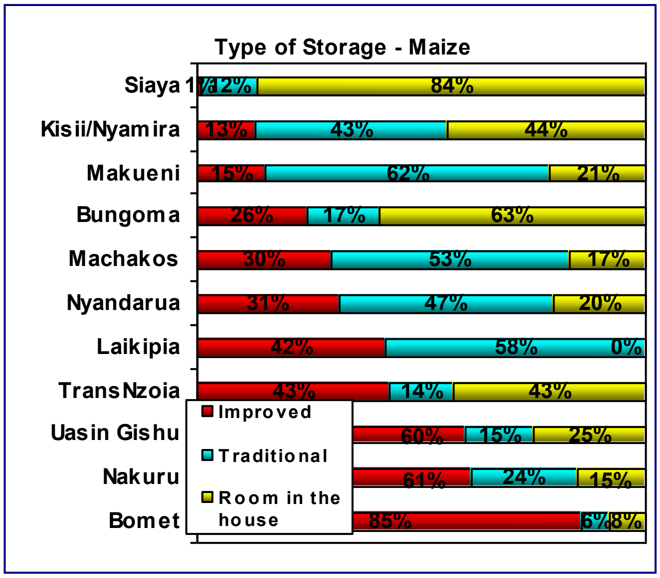
	Improved	Traditional	Room in the house
Maize	29%	27%	46%
Beans	18%	14%	37%
Green grams	1%	3%	0%
Cow peas	2%	6%	4%
Pigeon Peas	2%	5%	3%
Overall Usage	10	11	23

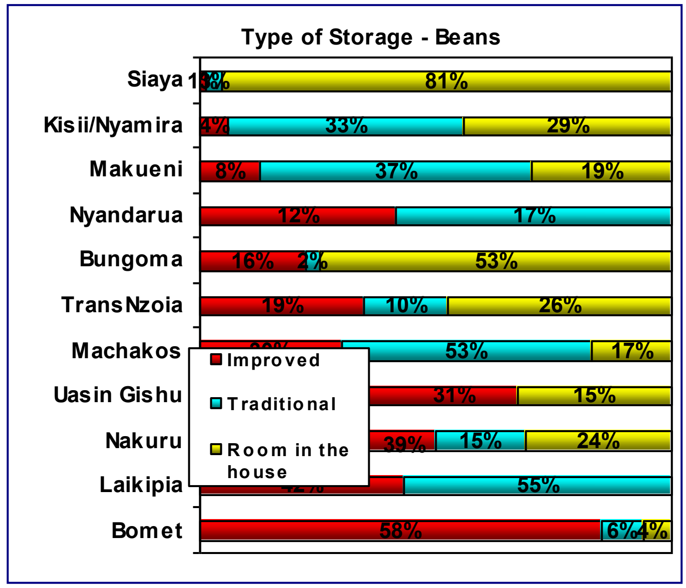
Figure 17: Proportion of Farmers with stores



Beans were mostly stored in a room in the house and in improved stores. The use of improved stores for maize was highest in Uasin Gishu (60%) and least in Nyamira. The use of traditional stores for maize storage was seen in Makueni (62%) while farmers in Siaya mainly used a room in the house for storage of both maize (84%) and beans (81%). It should be noted that Siaya recorded least ownership of improved stores and highest use of room in the house during the baseline indicating no change in store type over the period. The use of improved stores for beans was noted to be highest in Bomet (58%) while that of traditional stores was highest in Machakos (53%).

Figure 18: Type of store used in regions





There was a higher proportion of Female headed households using a room in the house for maize storage while a higher proportion of male and female households used improved stores.

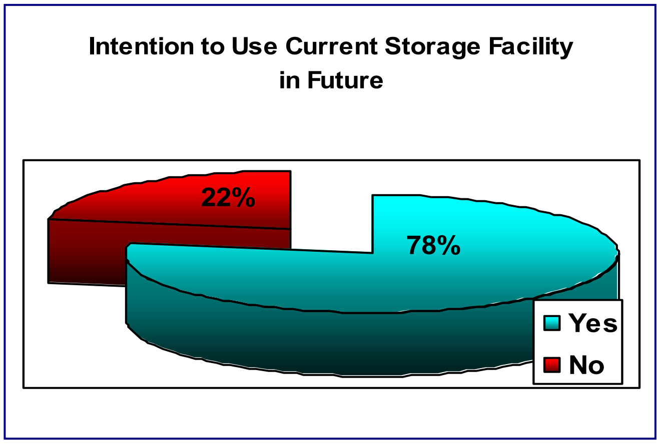
Figure 19: Storage Methods by Household Type

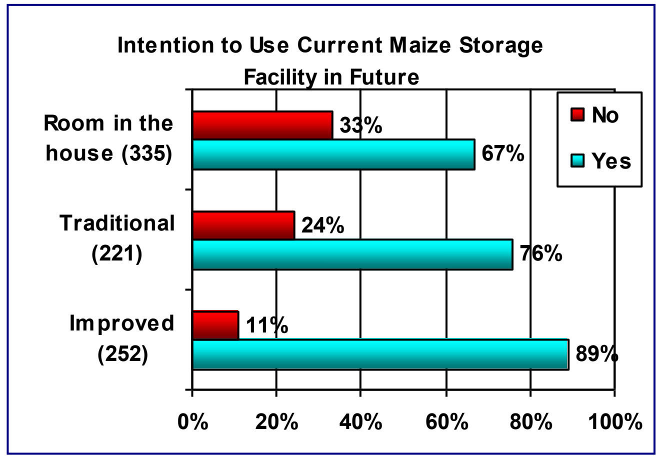
		MNF	FNM	M & F
Maize	Improved	27%	28%	32%
	Traditional	35%	23%	28%
	Room in the house	38%	49%	41%
Beans	Improved	19%	18%	19%
	Traditional	15%	14%	15%
	Room in the house	42%	40%	33%

Intention to Continue Using Current Storage Facility

Farmers were asked if they intended to continue using the storage method they had. More than three quarters of the farmers stated they intended to continue with their current storage method. Figure 36 below shows that maize farmers using improved store intended to continue using it. Of note is that farmers also using the traditional stores and a room in the house also intended to continue using them.

Figure 20: Intention to use current storage





Reasons given for those intending to continue using the current storage method for their crops included security reasons where farmers felt the store they had would keep the produce safe from theft and rodents. Others felt the current storage facility they had was cheap, spacious, highly ventilated and accessible or was still in good condition and thus no need to change it.

Table 14: Reason for intention to use current storage facility

Reasons for Intention to continue using current Storage Facility	
Secures from food rodents /free from pest / to protect the harvest from theft.	38%
The farm store ensures food and other tools secure/ it stores my farm produce /better storage facilities.	23%
It is cheap.	10%
It is big / spacious.	9%
The only storage device I have / the only store we have.	9%
Highly ventilated.	7%
Its accessible.	5%
Its modern /still in good condition	3%
The harvest is minimal.	2%
Its within in the homestead.	2%
Because buyers buy them in whole.	1%
Because of many commitment /too busy.	1%

Farmers who felt they needed to change their current storage facility had the intention of building a modern store, also felt the current store was not big enough for the farm requirements, was not strong enough or not secure enough to prevent theft and rodents among other reasons as tabulated below.

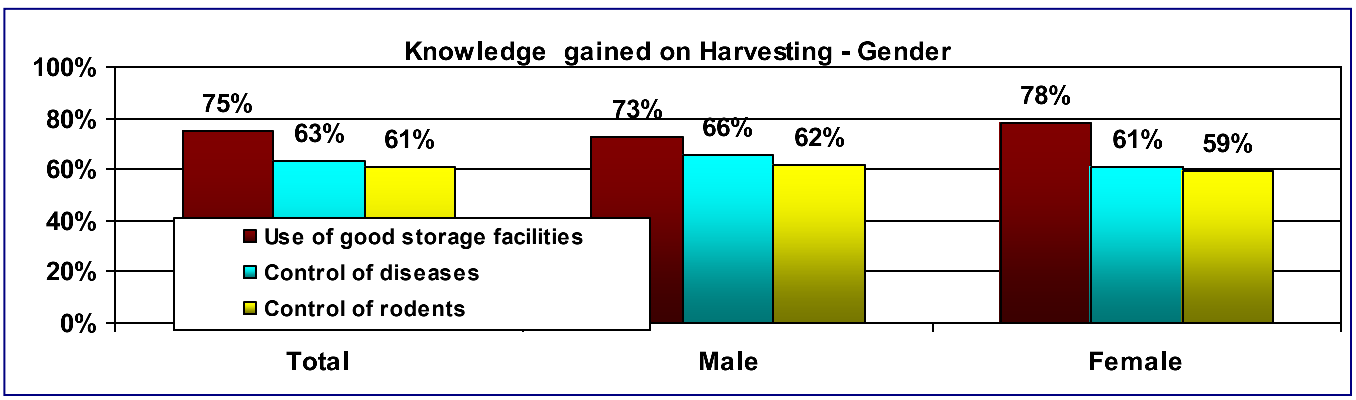
Table 15: Reasons for intention to change storage facility

Reasons for Intention to Discontinue using current Storage Facility	
I want to build a modern store.	36%
Its small and next season am expecting high yield hence I have to build a large one/ for storage purpose/ not spacious/ increase in farm inputs/ increase in produce/ productivity.	21%
It's not strong enough	13%
To avoid theft / due to insecurity in the region /because of theft.	8%
Want to take the warehouse where we as community keep our products so that we can get ready market.	7%
Not well ventilated.	6%
Rodents keep on destroying my harvest/ Attack by diseases	6%
Its not comfortable staying with maize in the house.	3%
Are easy to construct and manage.	2%

Knowledge Gained on Harvesting

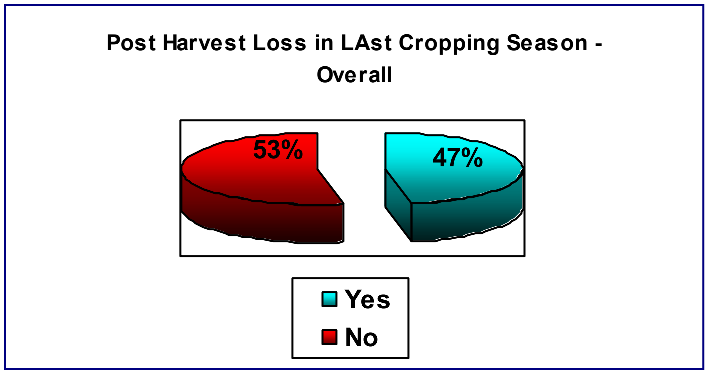
Farmers were asked what knowledge they had gained on harvesting from the programme. Three quarters of the farmers stated they had gained knowledge on the use of good storage facilities with slightly more females than males stating this. There was also a higher proportion of farmers in Transnzoia, Machakos and Makueni saying they had gained knowledge on the use of good storage facilities. Farmers had also gained knowledge on the control of diseases this being higher for males and farmers in Machakos, Makueni and Bungoma. Control of rodents was also by quoted 61% of farmers as knowledge gained on harvesting. The impact of this knowledge was seen more in Laikipia (91%) and Kisii (77%)

Figure 21: Knowledge gained on harvesting

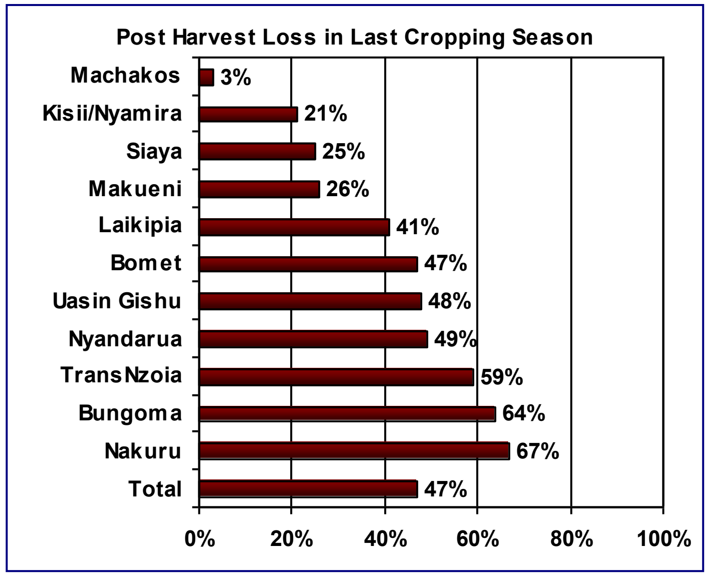


Post- Harvest loss refers to crops that were harvested but never consumed up or sold by the house due to spoilage arising from aflatoxin, rotting, rodent destruction or destruction by larger grain borers and/or weevils.

Figure 22: Proportion of farmers experiencing post harvest loss



The proportion of households experiencing post harvest loss was lesser (47%) than that during the baseline (52%)
Though farmers experienced post harvest loss in all regions, the least experiencing loss were in Machakos, Kisii, Siaya and Makueni while more of the farmers in Nakuru, Bungoma and Transnzoia experienced post harvest loss.



Post Harvest Loss incurred - Overall
Farmers who lost their maize harvest lost 21% of their produce. There was significant loss for beans produce as shown in the table below where farmers lost 42% of their produce.

Table 16: Post Harvest Loss by Crop

	Sample	KGs Harvested	Tonnes Harvested	KGs Lost	Tonnes Lost	% lost
Maize	358	810390	810.39	172290.6	172.3	21%
Beans	118	41992	41.992	17722.4	17.7	42%
Green Grams	2	65	0.065	24	0.024	40%
Cow Peas	2	300	0.3	252	0.252	84%
Pigeon Peas	2	240	0.24	160	0.16	67%
Sorghum	2	270	0.27	4	0.004	1.5%
Irish Potatoes	23	36746.4	36.7464	8562	8.6	23%
Sweet Potatoes	8	5252	5.252	2792	2.8	53%
Cassava	3	690	0.69	264	0.264	38%

NB: Post harvest losses incurred where samples are less than 30 may not indicate the actual figures. This information was also not tabulated by regions due to small sample sizes

Post harvest loss by household typology showed a loss of 12.4 MT of maize for female headed households while 156 MT were lost for male and female households.

Table 17: Post Harvest Loss by Household Typology

	MNF (Male no Female)				FNM (Female no Male)			
	Harvested (MT)	Base	Lost (MT)	Base	Harvested (MT)	Base	Lost (MT)	Base
Maize	23.409	9	1.89	9	48.47	30	12.4438	30
Beans	0.81	2	0.27	2	4.5212	14	1.7318	14
Irish Potatoes	-	-	-	-	2.16	4	0.574	4
S/potatoes	-		-	-	-	-	-	-

NB: Post harvest losses incurred where samples are less than 30 may not indicate the actual figures. This information was also not tabulated by regions due to the small sample sizes

M & F (Male & Female)				
	Harvested (MT)	Base	Lost (MT)	Base
Maize	738.338	319	156.8248	319
Beans	36.9358	102	15.6716	102
Irish Potatoes	34.505	19	7.9762	19
S/potatoes	2.388	7	2.432	7

The reasons for post harvest loss varied with 43% of the maize loss being attributed to natural disasters, 23% due to dampness, 12 % due to poor storage facility, 17% due to theft, 15% due to rodents and 12% due to aflatoxin. Other contributors to post harvest loss were late harvesting and insects. Of note is that farmers who lost their harvest in Siaya blamed it on poor storage facilities. It was noted earlier in this report that Siaya farmers were the highest users of rooms in their houses as stores.

Table 18: Reasons for Maize Post Harvest Loss

	Total	Machakos	Makueni	Bungoma	Siaya	Kisii/ Nyamira	Nyandarua	Uasin Gishu	Trans Nzoia	Nakuru	Bomet	Laikipia
Natural disasters	43%	0%	20%	46%	31%	43%	**50%**	**64%**	**77%**	27%	5%	31%
Dampness	23%	0%	0%	23%	0%	0%	21%	4%	23%	36%	**86%**	15%
Poor storage facility	21%	0%	30%	24%	**38%**	7%	21%	24%	23%	14%	0%	8%
Theft	17%	0%	20%	25%	25%	29%	4%	8%	0%	0%	9%	0%
Rodents	15%	**100%**	35%	14%	31%	29%	21%	4%	4%	23%	0%	8%
Aflatoxin	12%	0%	35%	1%	0%	0%	33%	24%	31%	14%	9%	**69%**
Late harvesting	11%	0%	10%	10%	13%	14%	4%	20%	4%	**32%**	0%	15%
Insects	9%	0%	5%	11%	25%	21%	0%	12%	8%	9%	0%	0%

Post harvest loss for beans was also largely due to natural disasters (53%) and dampness (28%). Poor storage facilities, insects, theft, rodents and late harvesting were also contributors to loss. Natural disasters were main contributors to post harvest loss in Uasin Gishu, Transnzoia and Nyandarua while dampness was largely experienced in Bomet.

Table 19: Reasons for Beans Post Harvest Loss

	Total	Makueni	Bungoma	Siaya	Kisii/ Nyamira	Nyandarua	Uasin Gishu	Trans Nzoia	Nakuru	Bomet	Laikipia
Natural disasters	53%	22%	59%	40%	0%	**80%**	**100%**	**88%**	42%	17%	60%
Dampness	28%	0%	36%	0%	25%	20%	0%	25%	25%	50%	20%
Poor storage facility	16%	**33%**	18%	0%	25%	0%	0%	13%	8%	**33%**	0%
Insects	14%	**44%**	11%	20%	25%	0%	0%	0%	17%	0%	20%
Theft	14%	11%	21%	20%	0%	20%	0%	0%	0%	0%	0%
Rodents	13%	22%	18%	20%	25%	0%	0%	0%	0%	0%	0%
Late harvesting	10%	11%	10%	60%	0%	0%	0%	0%	17%	0%	0%

3.3.2 Intermediate result 2: Increased trade and market access

While the introduction of new crop varieties led to better food security, there was also evidence of increased trade activities, better income and diversification of economic activities as well as accrued savings to the farmers' households. A few challenges were also experienced which included heavy rains in the harvest period which slowed down the bulking process. Farmers were therefore unable to meet their contractual obligations with the WFP in the fourth quarter of 2011. However, the consolidated grain in Bungoma and Makueni atttracted higher prices than farm gate sales on account of higher quality and sale to larger more discerning buyers. Sensitisation meetings on bulking were held in Makueni aimed at sensitising farmer organisations, the community and other stakeholders on the operations of the village bulking centres and how each could play a role in making them self sustainable.

The KMDP II also introduced to beneficiaries six (6) Market Information Systems MIS to promote increased trade and market access. This initiative was mainly championed by KMDP II partner, KACE. The MIS included information exchange platforms such as SMS service, Interactive Voice Response Service (IVRS), Internet based electronic database RECOTIS, Market Call Centre (MCC), KACE website and Soko Hewani radio programme.

KACE set up an SMS service on commodity prices with Safaricom which it promoted to traders and farmers. In the first quarter the service was scaled up through a partnership with Airtel to set up a similar SMS information dissemination service on its network. The service covered 20 commodities which were **cereals**: maize, rice, sorghum, millet, **pulses:** beans, soy beans, red grounds, green grams, **fresh produce:** cabbages, potatoes, tomatoes, bananas **and livestock:** steer, goat, chicken-broilers, eggs, **farm input:** DAP fertilizer, urea fertilizer and maize seeds, (KACE, 2011a). From KACE reports, the average number of SMS hits in 2011 was 13,158 for maize and 12,056 for other crops. The overall monthly average hits for all the crops were 25,214. In 2012, the average number of hits for maize was 16,035 and 16,572 for other crops. The overall monthly average hits were 32,607.

Soko Hewani, was one of the MIS which helped to reach a much wider audience (estimated at 5 million) but went off air in September 2011 due to the high cost of airing the programme. Market information for the 20 commodities was also availed through the IVRS service. In this service, KACE submitted updated market information to Adtel Phone Company which then translated the information into voicemail. The IVRS service, branded *Kilimo Hotline* was provided in two languages, English and Kiswahili. A number was provided which a client would dial at a fee then follow a simple pre-recorded voice prompt to access the information. The overall monthly average number of hits for IVRS in 2011 was 1,351 and 2,206 in 2012.

Futhermore, KACE ran an electronic information sytem through its website www.kacekenya.co.ke and the Regional Commodity Trade and Information System (RECOTIS). The organisation updated data on commodity prices, bids and offers on a daily basis. Information accessed through the website was only available to subscribed clients who paid a small fee to KACE, (KACE, 2011c). RECOTIS client base was dominated by agriculture related sectors with the top five slots being taken up by farmer groups, agricultural research centres and universities, commodity traders, processors and donor/relief/development agencies. The monthly average of hits for the KACE website in 2011 was 669 and 1,666 in 2012. The number of subscribers for RECOTIS remained constant at 600 subscribers in 2011 and 2012.

In order to facilitate bulk marketing, the concept of developing village bulking centres was adopted. Five market resource centres were also established by KACE. KACE facilitated the trade of 3,605 MT valued at 106,154,000 Ksh in 2011 and 2,032MT valued at 71,114,400 Ksh in 2012. Volumes traded through CGA were 532 MT valued at 20,753,515 KSH during the project period. Overall a total of 6,169 MT of assorted grains valued at 198,021,915 KSH were traded over the project implementation period.

Markets where farmers sold their last harvest

Farmers who sold their produce from their last harvest did so to mainly brokers (37%) and small traders on foot or bicycle (21%). The information tabulated below show minimal use of structured markets for the farmers for maize, beans and Irish potatoes.

Table 20: Markets used for sale of produce

	Maize	Beans	I. Potatoes
Total	**482**	**247**	**56**
Broker	37%	33%	64%
Small trader (on foot/bicycle)	21%	24%	7%
Large trader (Lorry)	12%	8%	23%
Institutions (hospitals, schools, hotels)	12%	17%	0%
Direct Consumer	12%	9%	2%
Village market	11%	17%	9%
NCPB	4%	2%	0%
Coop/Group	3%	1%	0%
Small (posho) Millers	2%	0%	0%
WFP	2%	1%	0%
large miller	1%	0%	0%
Food processors	1%	1%	2%

Market Drivers

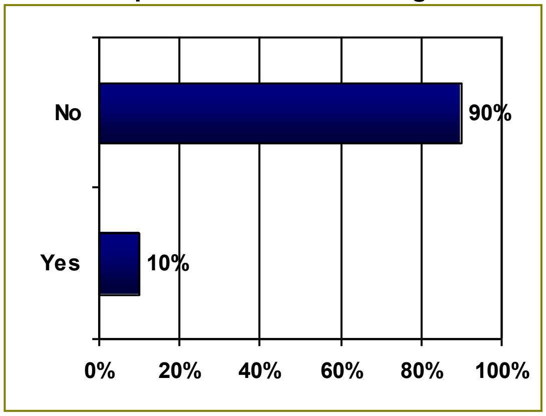
The main reasons for decisions to use certain markets for maize and beans produce were mainly due to the closeness of the market, better price offering, to repay credit, poor road conditions, for inputs procurement and emergencies (see tables below). The small traders were seen to offer a closer market and facilitated the farmer in obtaining quick money to procure inputs. Brokers were in addition perceived to offer better prices and as a result of emergencies faced by the farmers that required a close market but were also mainly used due to the poor road conditions that would require the farmer to spend more money in transporting their produce to the market. While there was minimal use of the NCPB, farmers who sold their produce felt the price offered was better. Institutions which included hospitals, schools and hotels were mainly used in order to repay credit.

Table 21: Reasons for markets used to sell maize

Used Maize Market	Closest market	Better price	Repaying credit	poor road conditions	Inputs procurement	Emergencies
	234	110	36	15	11	59
Small trader (on foot/bicycle)	26%	11%	8%	20%	64%	22%
Large trader (Lorry)	10%	14%	8%	13%	0%	10%
NCPB	1%	13%	0%	0%	0%	0%
Coop/Group	1%	7%	3%	0%	0%	0%
Small (posho) Millers	2%	1%	0%	0%	0%	0%
Large miller	0%	2%	0%	0%	0%	0%
Institutions (hospitals, schools, hotels)	4%	15%	42%	0%	0%	17%
Broker	39%	25%	19%	67%	27%	27%
Village market	8%	3%	17%	0%	0%	8%
WFP	0%	5%	0%	0%	0%	2%
Food processors	6%	5%	0%	0%	9%	0%
Direct Consumer	7%	5%	3%	0%	0%	14%

New Markets Introduced

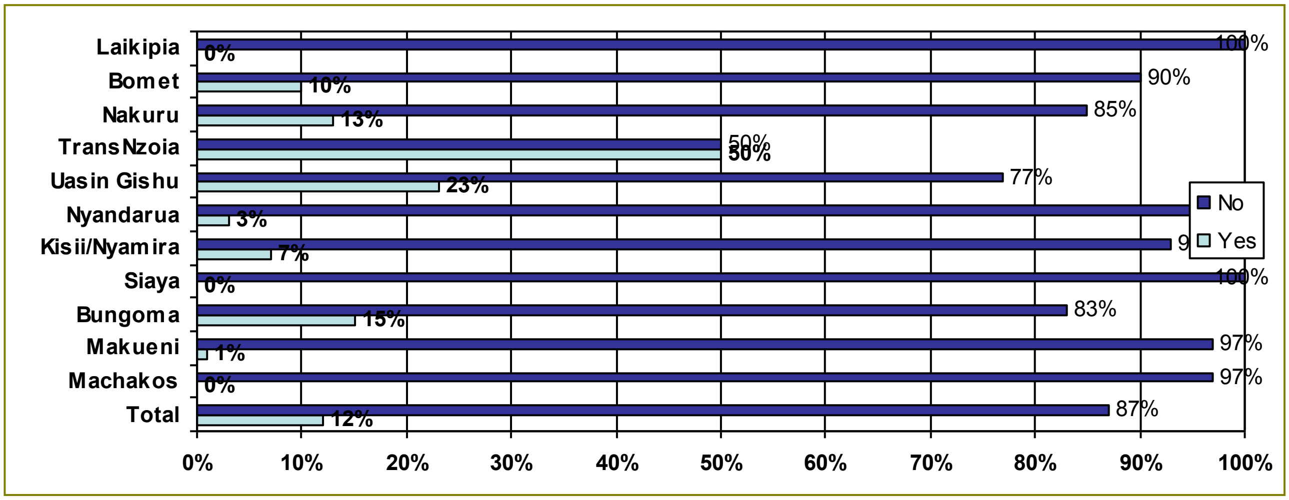
Figure 23: Proportion of farmers using new markets



Farmers were asked if they had been introduced to any of the markets they had sold their produce. Only 10% of the farmers claimed to have used markets they had been introduced to.

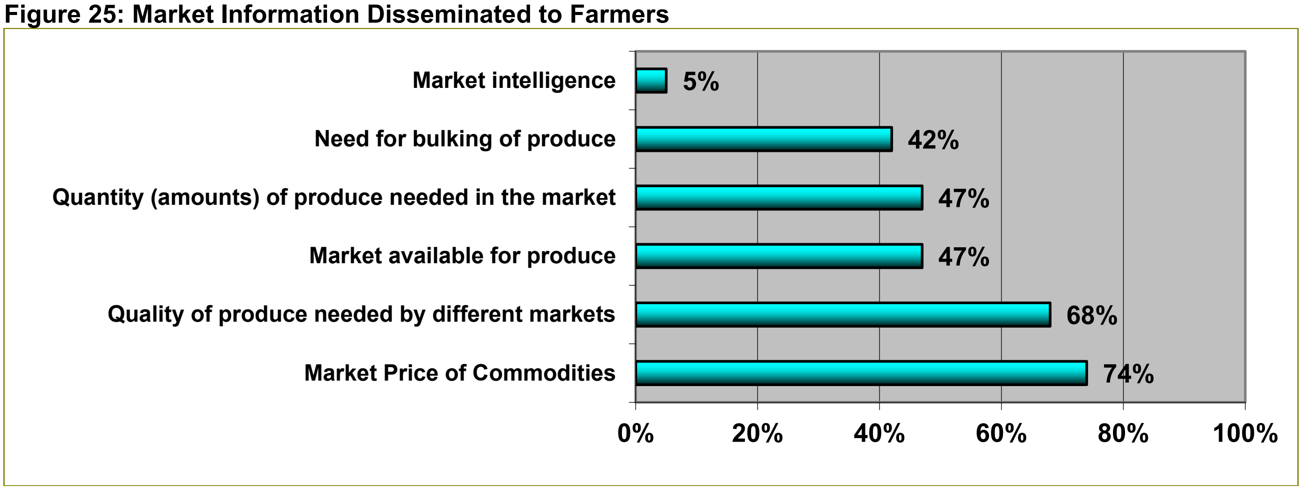
The use of new markets introduced under the programme was highest in Transnzoia with at least 50% of those selling their produce stating so. There was least use of new markets in Laikipia, Machakos, Makueni and Siaya.

Figure 24: Use of new markets by regions



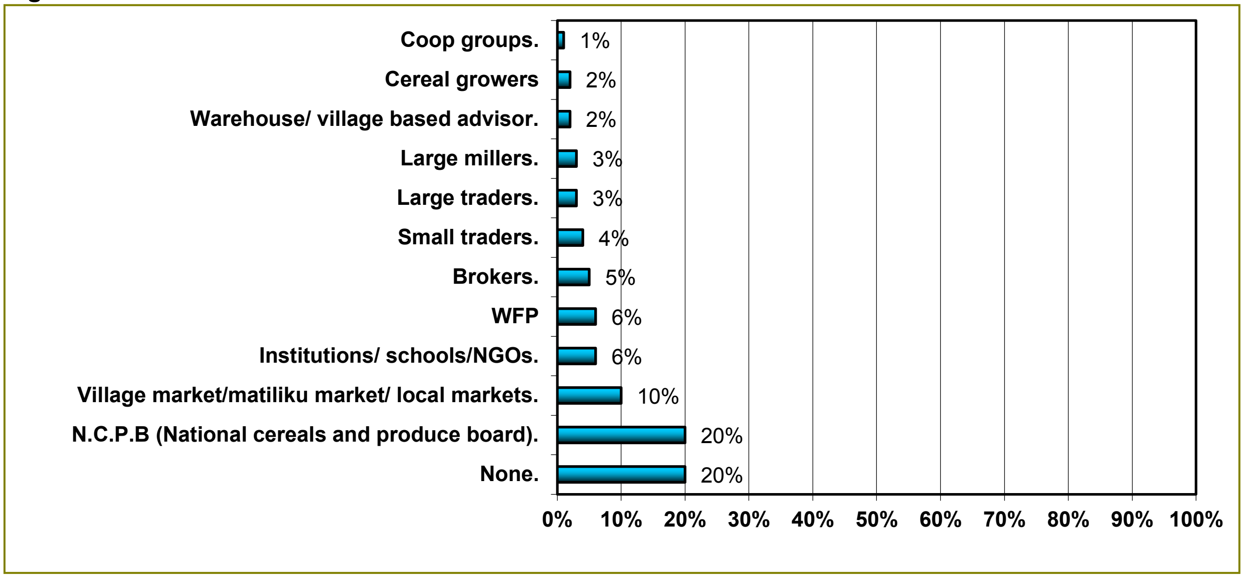
The market information offered to farmers included the market price of commodities, quality of produce needed by different markets, market available for produce, quantity of produce needed in the market, need for bulking of produce and general market intelligence.

Figure 25: Market Information Disseminated to Farmers



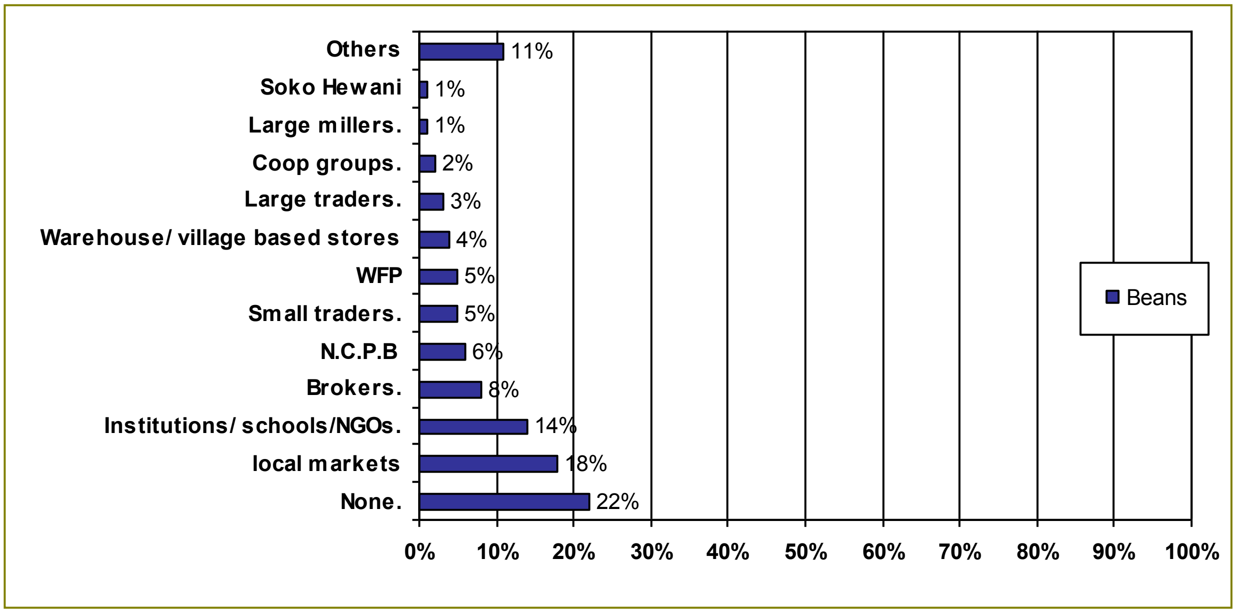
Farmers were asked where they intended to sell their produce in future. While 20% of the farmers did not to sell their produce to any new markets in the future, a further 20% intended to sell to the National Cereals and Produce Board.

Figure 26: Intention to use new maize markets in future



Farmers who intended to sell their beans to new markets indicated they would use the local market and institutions.

Figure 27: Intention to sell to new bean markets in future



Use of Technologies in Marketing

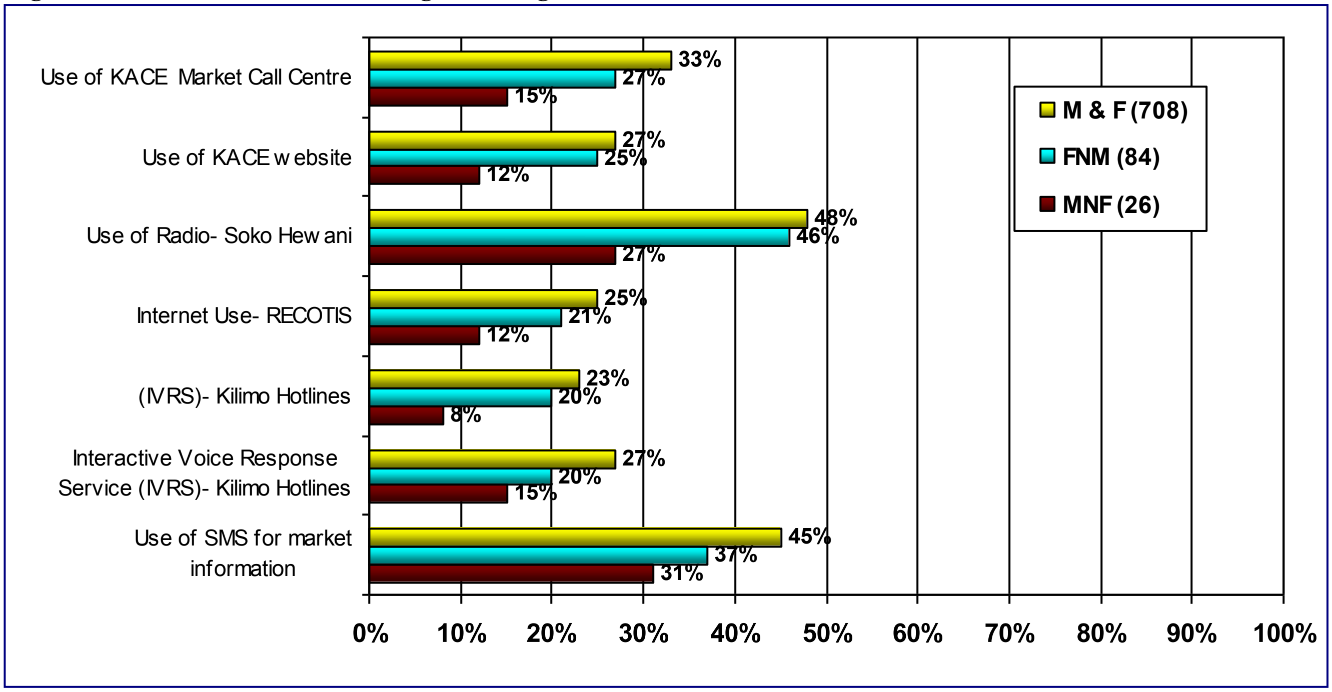
The most used technology to obtain market information by farmers were radio (Soko Hewani) and SMS at 12% and 11% respectively. Of note is that 77% of the farmers indicated they had not used the technology, this being slightly higher for female headed households (80%).

Table 22: Proportion of farmers using marketing technology

	Total	MNF	FNM	M & F
Total	**818**	**26**	**84**	**708**
Use of SMS for market information	11%	15%	10%	12%
Interactive Voice Response Service (IVRS)- Kilimo Hotlines	2%	0%	0%	2%
Internet Use- RECOTIS	0%	0%	0%	0%
Use of Radio- Soko Hewani	12%	12%	10%	12%
Use of KACE website	0%	0%	0%	0%
Use of KACE Market Call Centre	2%	4%	2%	2%
None	77%	77%	80%	76%

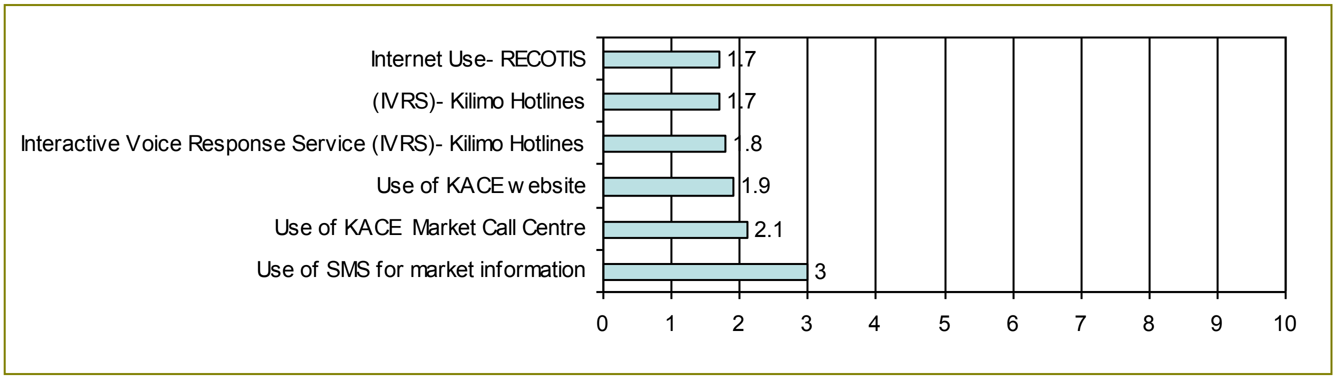
The marketing technology farmers felt they had benefited from most was the use of SMS and Radio (Soko Hewani) at 49% and 36% respectively. This can be attributed to these farmers having used the technology unlike those based on the internet system which had very little trial among the farmers as shown earlier on. Male and female households reported a higher intention to use radio (Soko Hewani-48%), SMS (45%) and in use of the market call centre (33%).

Figure 28: Intention to use marketing technologies in future



Farmers were asked to rate their level of knowledge on the various marketing technologies on a scale of 1-10 where 1 was very low and 10 very high. Farmers rated themselves below average on the use of all technologies indicating need for more information. However, the lowest levels of knowledge were recorded for RECOTIS and IVRS. It should also be noted that farmers had least intention for the use of these technologies in future which can be attributed to their low level of knowledge.

Figure 29: Level of Knowledge on Market Technologies



Intention to use marketing technology in future- Those NOT intending to use

Farmers **not** intending to use the various technologies in future cited various limitations with majority citing their lack of knowledge on the various technologies. Other limitations included accessibility of the technology, level of education and low yields.

Table 23: Reasons for non intent to use technology

Reasons	Use of SMS for market information	Interactive Voice Response Service	(IVRS)- Kilimo Hotlines	Internet Use- RECOTIS	Use of Radio- Soko Hewani	Use of KACE website	Market Call Centre
I don't have the knowledge	60%	79%	75%	71%	58%	69%	68%
Not accessible	10%	6%	6%	7%	9%	8%	7%
My yields are low.	4%	3%	3%	3%	4%	4%	3%
Not cheap / expensive.	2%	2%	2%	2%	3%	2%	2%
Am not educated.	2%	1%	2%	2%	3%	1%	2%
Others	22%	9%	12%	15%	23%	16%	18%

From qualitative research, the main challenges in marketing were in corruption, poor government policies on inputs and market prices, middle men who exploited the farmers, proper sorting and grading of produce and limited knowledge and access to ICT services.

3.3.3 Intermediate Result 3: Increased Access to Business Development Services

This indicator looked at four components namely: the number of business development services that were made available, the total number of SMEs accessing business development services, the total number of business service providers participating in the BDS program target areas and the number of SMEs receiving USG assistance to access credit. A total of 12 business development services were made available to farmers against a target of 8.

The total number of Individual farmers who benefited from business development services like training on various modules in the Farming as a Family Business curriculum, market access, input supply, training and technical assistance, access to financing, infrastructure, new technology and product development were approximately 11,096. The total number of individuals in Small and Medium Enterprises (SMEs) who benefited from business development services either through training on Entrepreneurship and Business Planning, beneficiaries of VBAs advisory services , inputs and outputs, business links, loans records, ICT extension service users data, trained in new product development were approximately 2,219. Total number of business service providers participating in the BDS program in target areas was 165 against 100. The total number of SMEs receiving USG assistance to access credit (beneficiaries of bank loans, MFIs, youth enterprise funds, women enterprise fund, group revolving fund) was 14 against a KMDP target of 30.

The two cases below show how farming has helped increase food security and household incomes. Farmers were able to produce surplus and through increased incomes educate their children and become debt free.

“Last year I took a loan of ten thousand which I used to farm beans after harvesting and selling the beans I planted tomatoes. I got about thirty thousand shillings from the beans and a hundred thousand from tomatoes. Then I bought two diary cows and sold them for seventy thousand. With that money I bought that quarter an acre of land…. and the money that remained from the profits is what I have used to farm maize, beans and tomatoes and now I am waiting for December. .”

“for me when my husband left he left me with a very big burden. He left me with debts amounting to almost two hundred thousand shillings. So I started with a loan of five thousand shillings and revived our coffee farming, he had a number, I paid for that and finished. Then I went back and took a loan of fifteen thousand, I bought fertilizers and put on the coffee and then I took them to my number I have a number as a planter of coffee and that brought me about sixty thousand. I used that money to pay off my loan and to take my children to school. I then farmed my land, I used to farm about three or four acres and this time I have farmed six acres and that has helped me a lot because I have paid off all my husband’s debts. I have been trying and the coffee from last year brought me one hundred and forty thousand shillings and now the children are continuing in school well and there is food in the home. I have also bought two dairy cows and I am doing well, and there is still produce in the farm that will be harvested and that has really helped me.
Kilongekeey Women’s group members

3.3.4 Intermediate Result 4: Increased Effectiveness of Farmer Organization

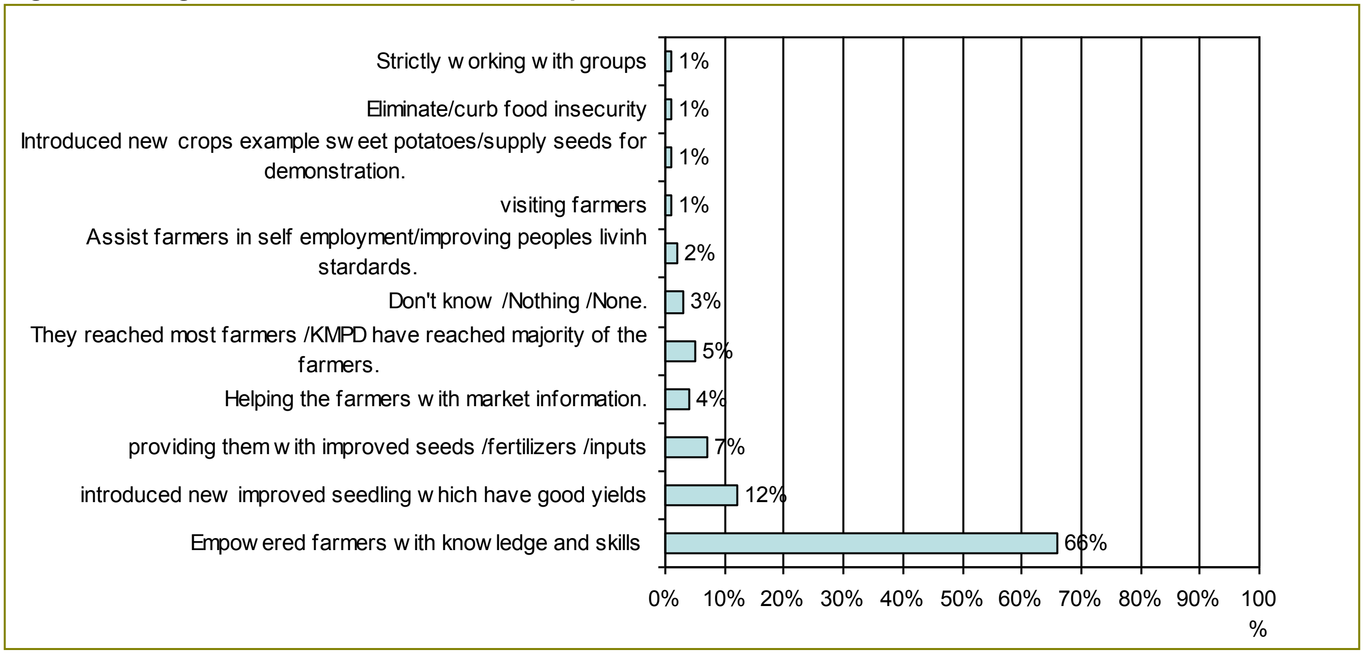
Beginning February 2011, ACDI/VOCA carried out Organisation Capacity Assessment Tests (OCATs) on target producer organisations. The aim was to assess the organizations’ business capacity and training needs. The OCATs benefited 242 producer groups between January and September 2011 with a total membership of 13201 members (5358 males and 7843 females). This was against a target of 60 groups. Of the 61 groups selected, the KMDP team visited 41 to present their findings. The groups were found to be weak particularly in financial management and record keeping, (ACDI/VOCA, 2011b). Workshops which aimed to address shortfall in leadership and management skills, record keeping and market share and to seek ways of ensuring the groups were self sustaining were held. A total of 14 training sessions were held by CGA; two targeting Trainer of Trainers and 12 grassroots level trainings benefiting 1,448 individuals benefited.

A group of 22 farmers from the North Rift visited their counterparts in Central Rift and Central Kenya in the first quarter of 2012. During these visits, they were able to see for themselves dairy farming on zero grazing and on very small land units. In 2012, the CGA led a group of farmers’ representatives at a meeting with the permanent secretary, Ministry of Agriculture on the challenges facing the agricultural sector. Among the issues touched on included government fertilizer subsidy, importation duty on maize and wheat, financing through credit guarantees and the 2012/2013 government budget estimates, (ACDI/VOCA, 2011a).

Successes of the KMDP II Programme

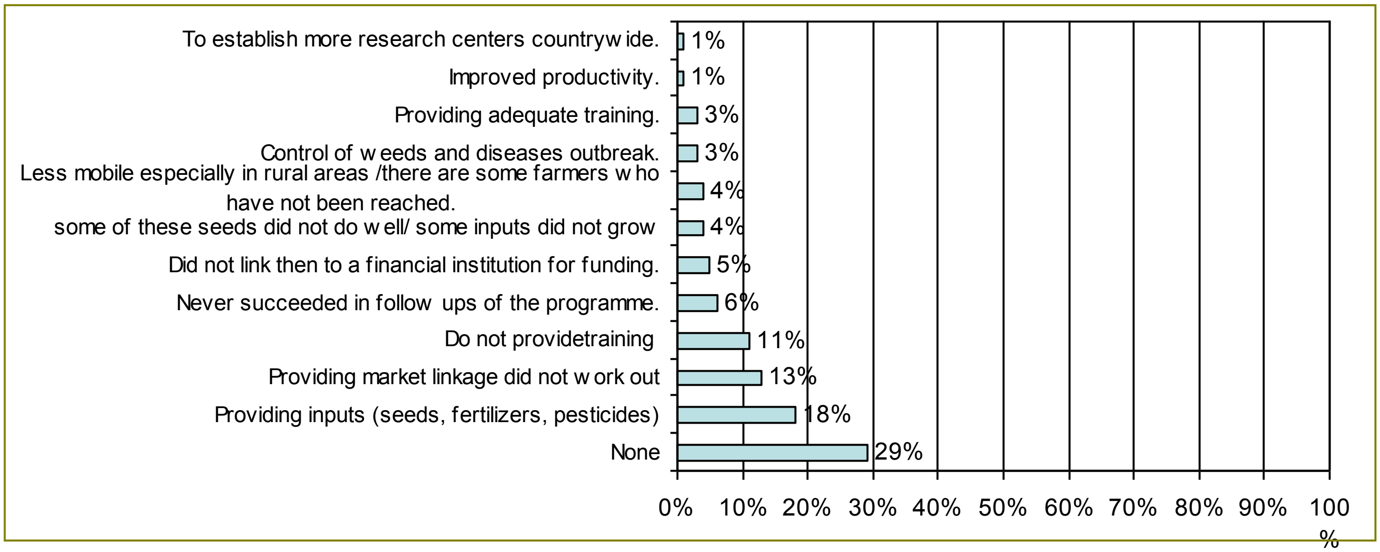
Farmers felt the main success of the programme was in imparting knowledge and skills (66%). Other successes included the introduction of improved seeds which provided good yields.

Figure 30: Programme Success-Farmers Perception



Areas where the programme did NOT succeed

Though 29% of the farmers were not aware of any areas which the programme had not succeeded in, 18% stated that the programme had not succeeded in providing farm inputs, providing market linkages (13%) and in providing training (11%) amongst others as shown in the figure below.



CHAPTER 4:
CONCLUSIONS
& RECOMMENDATIONS

4.0 CHAPTER FOUR: CONCLUSIONS & RECOMMENDATIONS

Overall the project was able to meet most of its objectives as set out in the indicators with the exception of the volume and value (falling short of 55.2%) and number of organizations accessing BDS (achieving 47%).

Adoption of production technology was high. The level of interest by farmers in this technology was also very was high as well as the intention to use this technology in future. Farmers however were pessimistic on the use of foliar fee, herbicides and NPK fertilizer as they felt they were too expensive and not necessary.

Marketing technology introduced for the farmers was not readily accessible to farmers who also had little knowledge in it leading to low adoption and low future intention use.

Despite knowledge gained in proper harvest storage, farmers did not readily adopt new storage methods due to security fears.

The use of different approaches in the programme increased the efficiency of the project. The use of VBAs/ promoters/TOTs and linkages established during the project with various sector players created a sustainability element within the programme as these persons would act as resource agents in the villages even after the end of the programme.

The different partnerships (both formal and informal) established during the programme implementation had also extended to partnerships between the private sector and the farmers. The interaction had created awareness to the farmer on where they could obtain information as well as inputs. The process had also created demand for products and services offered by the private partners. These linkages increased the sustainability element of the programme.

The intended programme implementation design was not fully followed leading to fragmentation of the intended value chain activities. This meant that the programme benefits were not uniformly received by the farmers as intended thus some farmers did not benefit from the entire value chain. The fragmentation also created communication challenges.

RECOMMENDATIONS

1. Future programmes should follow the original design as much as possible in order to achieve intended benefits

2. Extensive consultations should be carried out between implementing partners before the onset of project activities to ensure collaboration in all programme activities. This would entail synergised planning and communication between project partners and their staff and would ensure that the project design phase takes into account the strengths and weaknesses of each partner and creates synergies where need be for the success of the programme

3. Budgetary needs and timely releases should be considered and effected to meet both the farmers and partners needs

4. There is need to review technologies introduced to farmers. Consultations should be held with project beneficiaries to understand which technologies would be suitable. This also follows for any intended technology including storage methods

5. Communication was mentioned as a weakness during the project implementation, effective channels of communication should thus be considered during programme design

6. Farmers cited follow-up as one of the areas requiring improvement. Mechanisms should therefore be placed in future to ensure there is easy and continuous follow up on the project beneficiaries. This would ensure increase in knowledge and high adoption rates.

7. Improvements in increasing the effectiveness of multiple value chains can be achieved through incorporating all value chain crops especially in all value chain activities by partners, a clear focus by all partners in the value chains intended for the project to avoid deviations and thus maximum input into the value chains and through proper follow up from the onset to ensure this is incorporated in quarter plans