



**TEGEMEO INSTITUTE OF AGRICULTURAL
POLICY AND DEVELOPMENT**

**IMPROVING PARTICIPATION IN AGRICULTURAL COMMODITY
MARKETS FOR SMALLHOLDER SWEET POTATO FARMERS
IN KENYA: ASSESSING GROWTH OPPORTUNITIES FOR
WOMEN IN RACHUONYO DISTRICT**

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October 2013

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EXECUTIVE SUMMARY

Agricultural growth is fundamental to broader economic growth and to successful poverty reduction in sub-Saharan Africa, where high concentration of the poor population is in agriculture sector and where smallholder farmers constitute majority of the agricultural and rural population. However, much of Africa's agriculture is characterized by semi-subsistence, low-input, low-productivity farming systems, which is not favorable to achieving broad-based growth. Transformation to a more commercialized agriculture is, therefore, unavoidable if the broad-based growth is to be achieved. Better and more accessible markets are a fundamental ingredient to a more commercialized agriculture. Yet in developing countries, particularly in sub-Saharan Africa, markets for agricultural inputs, outputs and finance remain thin and infrastructure is poor, resulting in high transaction risks and costs.

While market failure is a major constraint to many smallholder farmers, the effects are compounded for marginalized groups such as women, the poor and producers in areas with low agricultural potential (agriculturally less favored areas) because of their circumstances. Addressing the challenges faced by the marginalized groups in accessing agricultural markets remains a necessary priority in efforts to foster broad-based agricultural growth, and thereby contribute towards poverty reduction. Identifying specific agricultural commodities/value chains as well as interventions that could offer the best opportunities for sales, income, and poverty alleviation for marginalized groups is important in the process of making beneficial investments to these groups. Analysis of value chains in combination with the characteristics of the marginalized groups of interest as well as characteristics of the potential interventions would be helpful in informing the design of such interventions for greater impact. This study sought to identify critical challenges that need to be addressed and assess growth opportunities that could be exploited to improve access to and participation by women smallholders in agricultural markets.

This study builds on findings from an earlier study carried out as a joint collaboration between Tegemeo Institute, Egerton University, World Agro-forestry Centre (ICRAF) and Makerere University on "Participation in Agricultural Commodity Markets among the Poor and Marginalized in Kenya and Uganda", which used household panel data to examine trends and patterns in smallholder participation in agricultural markets. The current study focused on sweet potatoes value chain, which the earlier study identified as holding potential for integrating small holder farmers in markets, and women as a marginalized group. The objective was to assess opportunities for growth in the value chain with a view to identifying investment areas for increased market participation especially for women.

The study site was Kabondo Division, Rachuonyo South District, Homa Bay County, the leading sweet potato production area in Kenya. The study adopted a value chain approach. A sample of 100 sweet potato farming households and two farmer groups were interviewed. Two focus group discussions were also held with sweet potato growers in the area. In addition, interviews were also conducted on a range of sweet potato traders and key

informants along the value chain, including input suppliers, commodity traders and service providers, including government agricultural officers.

Results of the study showed that women dominate all the production and trading nodes of the sweet potato value chain. In addition, the study revealed opportunities that if harnessed have the potential to integrate women more in the sweet potato value chain and improve their welfare through potential benefits from the improved value chain. However, these opportunities exist alongside constraints which need to be addressed in efforts to make the value chain work better for the benefit of the players, who are mainly women. For the producers, major constraints identified were:

- Lack of access to affordable credit for production, mainly due to stringent conditions and requirements by formal institutions offering credit
- Unorganized spot markets, where producers have little bargaining power on setting grades and prices. This results in low producer prices.
- Lack of enforcement of law concerning sweet potato standard packaging units, making producers lose
- Opportunistic behavior by brokers in major urban markets increases transaction costs
- Erratic weather patterns
- Incidences of pests, especially sweet potato weevil
- Limited access to agronomic advice, and
- High cost of labour

For traders, the major constraints identified were:

- Poor feeder roads and high transport costs. The cost of transport accounted for over 50 percent of marketing costs incurred by large traders, who move the produce from the production area to major urban markets including Nairobi, Gikomba and Mombasa
- Highly fluctuating commodity supply in the market, because of lack of storage facilities in the face of seasonal production. The perishable nature of the commodity cannot allow for long shelf-life without proper storage facilities
- Lack of affordable credit services for business expansion, and
- Opportunistic behavior by brokers in major urban markets.

Despite the above constraints, there are opportunities that if harnessed can lead to better integration of women in the commodity market. First, the conducive agro-ecology for production and growing demand for sweet potato offer opportunity for growth in the production and marketing of sweet potatoes. Potential for processing is also an avenue that can be explored to foster growth in demand. Secondly, the already existing commercial-

oriented production and fairly well established institutions along the chain, especially at production level, provide a more stable platform for investment both in production and marketing of the commodity. Thirdly, a wide network of stakeholders working to promote the enterprise is an indication of the potential for growth in the sweet potato value chain, and synergies by the stakeholders can be harnessed for greater impact. The goodwill by the government policy under the traditional high value crops initiative provides an opportunity for addressing especially infrastructural and policy regulatory constraints along the value chain. Finally, fairly well-established collective action institutions around sweet potato production can be a good avenue to engage with especially women to promote collective action around sweet potato production and marketing and provision of production and marketing facilitative services.

Three important constraints that need to be addressed in efforts to tap into the opportunities were identified. First, liquidity constraint among women producers is important. Currently, many producer groups offer credit facilities to their members. Strengthening the capacity of the producer groups to continue offering credit services to members may be desirable. However, even with strengthening, the adequacy of these groups to meet financial needs of producers to enable them increase commercial production of sweet potato production is an issue that needs careful thought.

Secondly, producers need strengthening to have better bargaining power on setting grades and prices. This could be done through strengthening the existing collective action institutions among producers to engage in collective marketing.

Thirdly, there is need to ensure enforcement of the law concerning sweet potato standard packaging units, which is documented under the The Local Government Act (Cap. 265).

Finally, there is need to improve bargaining strength of producers and traders in the major urban markets to counter the opportunistic behavior by brokers in those markets.

ACKNOWLEDGEMENT

Tegemeo Institute and the authors would like to thank everyone who contributed to the preparation of this report and completion of the entire study on *Improving Participation in Agricultural Markets for Smallholder Farmers in Kenya: Assessing Growth Opportunities for Marginalized Groups*. We acknowledge the partnership between researchers from the Institute and the World Agroforestry Centre (ICRAF) whose collaborative effort resulted in the successful completion of the project. We appreciate the support from the FORD Foundation and the United States Agency for International Development (USAID) to carry out the study. We acknowledge technical contributions from other Tegemeo and ICRAF colleagues during the study design, data collection, analysis and report writing, and support during preparation of the dissemination workshop. In addition, we appreciate the valuable contribution from various stakeholders who provided the data and also participated in the workshop, including farmers and other actors along the selected value chains. We would also like to acknowledge cooperation and support accorded to us by the administration of Egerton University, without which the completion of this study would have been difficult.

John Olwande, Lilian Kiriimi, Mary Mathenge, Judith Oduol, Dagmar Mithöfer, and Frank Place prepared this report on behalf of Tegemeo Institute and ICRAF. The opinions expressed in this document are the authors', and do not necessarily represent the views of the two institutions or those of the Ford Foundation. Any enquiries should be channeled through:

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
ACKNOWLEDGEMENT.....	iv
TABLE OF CONTENTS	v
LIST OF TABLES	vii
LIST OF FIGURES	vii
1 INTRODUCTION AND OBJECTIVES	1
1.1 Background.....	1
1.2 Justification and Objectives.....	2
1.3 Sweet Potato Value Chain in Kenya	3
2 METHODOLOGY	5
2.1 Study Site	5
2.2 Sampling.....	6
2.2.1 Household Survey.....	6
2.2.2 Focus Group Discussion	7
2.2.3 Case Studies.....	7
2.2.4 Other Chain Actors	7
2.3 Data collection and Analysis	7
3 SWEET POTATO VALUE CHAIN	8
3.1 Overview of the Sweet Potato Value Chain.....	8
3.2 Input Suppliers.....	9
3.3 Producers.....	10
3.3.1 Importance of Sweet Potato among Farm Enterprises.....	10
3.3.2 Characteristics of Sweet Potato Producers.....	11
3.3.3 Marketing	13
3.3.4 Opportunities and Constraints Faced by Producers.....	16
3.4 Primary Brokers.....	18
3.5 Primary Retailers	19
3.6 The Kabondo Sweet Potatoes Marketing Cooperative Society.....	19
3.7 Large Traders.....	20
3.8 Secondary Brokers	21
3.9 Secondary Retailers.....	21

3.10	Terminal Retailers.....	21
3.11	Consumers	21
3.12	Opportunities and Constraints Faced by Sweet Potato Traders along the Value Chain 22	
3.13	Value Chain Enablers/Facilitators	23
3.13.1	Technical Support Services	23
3.13.2	Financial Services	23
3.13.3	Transport Services	24
3.13.4	Loading and Off-loading Services.....	24
3.13.5	Cleaning and Sorting Services.....	24
3.13.6	Packaging Services	24
3.14	Women’s Participation in the Sweet Potato Value Chain.....	24
3.15	Producer and Trader Costs and Margins	1
4	COLECTIVE ACTION AND USE OF ICT ALONG THE VALUE CHAIN	4
4.1	Collective Action	4
4.1.1	Sweet Potato Producers’ Participation in Collective Action.....	4
4.1.2	Case Studies on Collective Action.....	6
4.1.3	Potential Actions to Improve the Capacity of Collective Action Institutions.....	9
4.2	Information and Communication Technology	9
5	CONCLUSION AND RECOMMENDATIONS	11
5.1	Conclusion.....	11
5.2	Recommendations.....	11
	REFERENCES	14
	Annex 1: Golden Kitare Women Group	16
	Annex 2: Kabula Women Group	19
	Annex 3: Kabondo Sweet Potatoes Marketing Cooperative Society.....	23

LIST OF TABLES

Table 1: Household income by gender of household head	11
Table 2: Persons responsible for sweet potato production, by gender of household head.....	12
Table 3: Demographic characteristics of persons responsible for sweet potato production, by gender.....	12
Table 4: Acreage, production and sales of sweet potatoes, by gender.....	12
Table 5: Acreage, production and sales of sweet potatoes, by gender or producer and household head.....	13
Table 6: Persons responsible for sales decision on sweet potatoes, by gender of household head.....	13
Table 7: Persons controlling revenue from sweet potatoes, by gender of household head.....	13
Table 8: Persons controlling revenue, where women are responsible for production.....	14
Table 9: Share of sweet potatoes sold to various buyers.....	14
Table 10: Reasons for sale to buyer	15
Table 11: Sweet potato marketing outlets for producers.....	15
Table 12: Production constraints reported by households.....	17
Table 13: Marketing constraints reported by households	17
Table 14: Producer cost of production, revenue and gross margin (N=98)	2
Table 15: Costs and margins per 90 kg bag extended along the value chain.....	3
Table 16: Services offered by groups.....	5
Table 17: Benefits derived from participating in groups	6
Table 18: Sources of credit for sweet potato producers	6
Table 19: SWOT analysis of sweet potato value chain.....	11

LIST OF FIGURES

Figure 1: Sweet potato production trend in Kenya	4
Figure 2: Sweet potato value chain map in Kabondo Division	9
Figure 3: Producer gross margin per bag, by buyer type	2
Figure 4: Share of marketing cost components along the sweet potato value chain	3
Figure 5: Enterprises and activities by the groups.....	5

1 INTRODUCTION AND OBJECTIVES

1.1 Background

Agricultural growth is widely recognized as fundamental to broader economic growth and to successful poverty reduction in sub-Saharan Africa, where high concentration of the poor population is in agriculture sector and where smallholder farmers constitute majority of the agricultural and rural population. However, much of Africa's agriculture is characterized by semi-subsistence, low-input, low-productivity farming systems, which is not favorable to achieving broad-based growth. Transformation to a more commercialized agriculture is, therefore, unavoidable if the broad-based growth is to be achieved (Morris et al. 2009). Better and more accessible markets are a fundamental ingredient to a more commercialized agriculture, just as are technologies and macroeconomic policies, as they are key determinants of farm productivity, food prices, and food availability (ILRI, 2011). Well-functioning markets send effective signals that influence incentives for investments by firms, households and workers, and enhance their efficiency and opportunities facing them (ILRI, 2011). Yet in developing countries, particularly in sub-Saharan Africa, markets for agricultural inputs, outputs and finance remain thin (Poulton et al., 2006), and infrastructure, both 'hard' (e.g. roads) and 'soft' (e.g. telecommunications and information) are poor. The result is high transaction risks and costs (Poulton et al., 2006), which can distort crop choices by farmers and significantly dampen farmers' returns from market participation and discourage them from producing for the market (ILRI, 2011).

While market failure is a major constraint to many smallholder farmers, the effects are compounded for marginalized groups such as women, the poor and producers in areas with low agricultural potential (agriculturally less favored areas) because of their circumstances. For instance, women lack secure rights to production resources and assets (e.g. land, labor, capital), are more likely to be 'unserved' by formal financial markets and have lower access to market information services and markets (especially formal markets) compared to men, and are often overrepresented among the poor and food insecure (Njuki, 2011; The World Bank, 2008). In less favored areas, reliance on rain-fed agriculture is a major production risk. The result is low production volumes by these groups, and dismal sales in local spot markets. These groups also tend to be concentrated at the lower levels of the supply or value chain and in low value products (Baden, 1998; World Bank, 2003).

Addressing the challenges faced by the marginalized groups in accessing agricultural markets, remains a necessary priority in efforts to foster broad-based agricultural growth, and thereby contribute towards poverty reduction. But interventions necessary for integrating the marginalized groups into markets may differ by commodity market chain and by marginalized group. For example, investments required in vegetables or fruits are different from those in cereals, due to differences in perishability, potential for value adding, and standards, among others. Interventions for women will differ from those for men due to

differences in their access to productive assets, while interventions aiming at market integration of farmers in agriculturally low potential areas may differ from those of farmers in high potential areas and closer to urban centers. Consequently, identifying specific agricultural commodities/value chains as well as interventions that could offer the best opportunities for sales, income, and poverty alleviation for marginalized groups is a critical step in the process of making beneficial investments to these groups. Further, analysis of the value chains in combination with the characteristics of the marginalized groups of interest as well as characteristics of the potential interventions would be helpful in informing the design of such interventions for greater impact. This study seeks to identify critical challenges that need to be addressed and assess growth opportunities that could be exploited to improve access to and participation by women smallholders in agricultural markets.

1.2 Justification and Objectives

This study builds on findings from an earlier study carried out as a joint collaboration between Tegemeo Institute, Egerton University, World Agro-forestry Centre (ICRAF) and Makerere University on “Participation in Agricultural Commodity Markets among the Poor and Marginalized in Kenya and Uganda”. The earlier study was based on household panel survey datasets in Uganda and Kenya, and aimed at identifying promising enterprises for the marginalized groups (poor, women, and households in low potential areas) based on the importance of market participation in various enterprises for the respective groups and/or growing trends in market participation by the groups relative to other enterprises. It also assessed household level factors that promoted market access and participation by the marginalized groups. The scope of the earlier study was limited to existing household data, and did not consider other aspects of the enterprises, notably the functioning of markets and value chains. Also, the earlier study results showed that participation in several enterprise markets as well as the degree of overall commercial orientation by the marginalized groups was significantly and positively influenced by membership in farmer groups, an indication that collective action would be an attractive investment area for efforts aimed at increasing market participation by the marginalized groups. However, how collective action promoted market integration for marginalized groups was not understood in greater depth. This study attempts to address the above limitations of the earlier study, focusing on sweet potatoes value chain and women as a marginalized group. The findings will contribute to knowledge base on feasible investment areas for fostering smallholder women’s access to and participation in agricultural markets. The findings will be useful to policymakers, researchers and development practitioners in their work towards improving the welfare of the marginalized groups in Kenya. The findings will also be important source of information to the ongoing development of the gender policy for the agricultural sector.

To achieve the objectives of the study, the following questions are answered:

- a. What are the existing marketing arrangements¹ along the sweet potato value chain, and what are their characteristics?
- b. What are the general constraints and opportunities that traders, processors and sellers have along the sweet potato value chain? What are the specific constraints and opportunities that they perceive with regards to participation of smallholder farmers and women in the value chain?
- c. What are the growth prospects – export, domestic urban, domestic rural- and for women in sweet potato enterprise?
- d. What market related activities do farmer organizations/groups deal in, and what is the composition of members and their management and governance structures?
- e. What are the views of farmers on the usefulness of collective action in terms of establishing and maintaining the link to the market? What could be improved? What additional benefits are associated with participating in the groups? What are the costs (monetary and non- monetary) associated with participating in the groups' activities? What do buyers perceive as the positive aspects of farmer collective action?

1.3 Sweet Potato Value Chain in Kenya

Sweet potato is believed to have originated from South/Central America and was brought into Africa by the Portuguese sailors in the 16th Century. Having been cultivated in Sub-Saharan Africa for centuries, sweet potato is regarded as indigenous African food crop. In Africa, it is mainly cultivated for human consumption whereas in Asia it is produced mainly for animal use. Worldwide, sweet potato is the sixth most important food crop after rice, wheat, potatoes, maize, and cassava while in the developing nations sweet potato is the fifth most important food crop (International Potato Center, 2013). China produces over 50 percent of the world's sweet potatoes. In Africa, Uganda and Nigeria are the largest producers of sweet potatoes, respectively. Other major producers are Tanzania, Rwanda, Burundi and Mozambique.

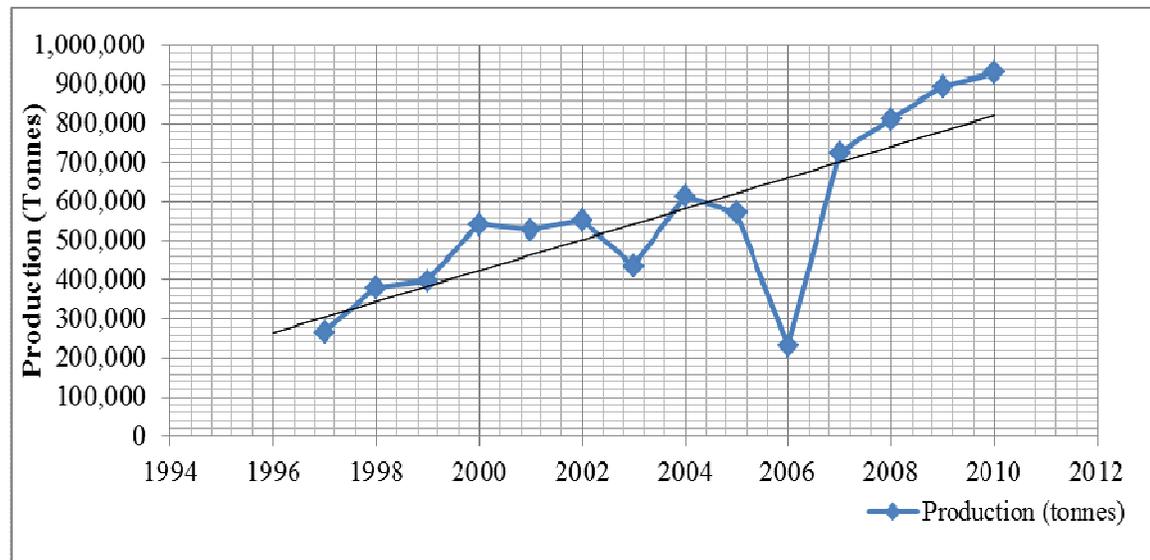
In Kenya, sweet potato is recognized as an alternative food crop among many households, whose main staple food is maize (Low *et al.* 1997). It is often considered “subsistence”, “food security” or “famine relief” crop (Günter *et al.*, 2010). Its importance is evident when there is shortage in maize supply, usually when there is shortfall in production or immediate time before harvest of maize. In such cases, sweet potato and other indigenous tubers such as cassava become very important in the diet of many rural households. On the other hand,

¹ We placed relatively more focus on the traditional marketing sector than the modern retail sector in this study. This is consistent with findings from Tschirley, et al. (2010), who show that at least marketing of fresh produce such as fruits and vegetables is dominated by traditional informal marketing arrangements.

demand for sweet potato among the urban population is growing rapidly due to changing consumption patterns and population growth. Therefore, the importance of sweet potato in Kenya cannot be overemphasized due to the potential that it holds for both producers (as an income generating enterprise) and consumers (as a source of nutritious staple food).

Generally, production of sweet potato in Kenya has steadily increased over the years (Figure 1). According to the Ministry of Agriculture (2011b), sweet potato production increased by 89 percent between 2004 and 2009, a scenario attributed to use of improved cultivars and farming methods which have helped increase yield per unit area (Ministry of Agriculture, 2010c; Kenyon *et al.*, 2006). In the recent past, there have been renewed efforts by the government and other players in the agriculture sector to promote production of traditional high value crops of which sweet potato is among them. For example, through the traditional high value crops (THVC) programme, the government distributes to farmers improved planting materials for the crops as one of the activities in efforts to promote their production. These efforts are a result of the recognition of the important role of these crops in contributing to food security through increasing food supply to both the producers and consumers and generating income to the producers.

Figure 1: Sweet potato production trend in Kenya



Source: FAOSTAT, (2012)

Sweet potato is produced mainly in Nyanza and Western province. Some cultivation of the crop is also carried out in parts of Eastern, Central and Coast provinces. Nyanza province accounts for over 50 percent of national sweet potato production. According to Economic Review of Agriculture (2012), Nyanza province accounted for 57 percent of national output of sweet potato in 2011. Homa-Bay and Migori counties in the province were reported as the main production areas. Sweet potato production in these areas is primarily rain-fed, with few farmers practising irrigation along rivers.

Production of sweet potato in Kenya is dominated by smallholder farmers. The small scale production system usually translates into scattered small quantities of output which, combined with the bulkiness and perishability of the crop, makes marketing of the commodity a major challenge. It is estimated that over 80 percent of sweet potatoes in Kenya are sold fresh and the market for the commodity is not well-organized. Post-harvest losses and low producer prices are a challenge.

Despite the argument that participation of smallholder producers in market-oriented production has potential for diversifying their incomes and increasing agriculture productivity while promoting food security and poverty eradication, the potential for sweet potato to provide these benefits especially to women who play a major role in the production of the commodity is still underutilized. It is in this light that the study was conducted to further knowledge on the nature of sweet potato markets with a view to exploring pathways for integrating women into the commodity markets.

The remainder of the report is organized as follows: Section two presents the methodology of the study, with details on the study site, sampling procedure and data collection and analysis approach. Value chain analysis results are presented in Section 3. The actors and their characteristics and marketing arrangements along the chain are discussed. Value chain enablers/facilitators and constraints and opportunities faced by the actors along the chain are identified. Women's level of participation along the chain is discussed. Section 4 discusses collective action among sweet potato producers and information and communication technology (ICT) use along the value chain. Potential investment areas to enhance the capacity of the collective action institutions to enhance market linkages are identified. Strength, weaknesses, opportunities and threats identified in the value chain and recommendations conclude in section 4.

2 METHODOLOGY

This study is a detailed value chain analysis of sweet potatoes, focusing on the role of women in the value chain and opportunities and constraints they face. The aim is to identify critical challenges and assess growth opportunities that could be exploited in improving access to and participation by women in sweet potato value chain. Both qualitative and quantitative approaches were used in the study to collect information from a range of value chain players. Surveys were conducted on sweet potato producing households and sweet potato traders; focus group discussions held with sweet potato producers; key informant interviews conducted with other players along the value chain; and case studies of selected sweet potato producer organizations conducted.

2.1 Study Site

The study site was Kabondo Division, Rachuonyo South District, Homa Bay County, in Kenya. Site selection for the study was based on information obtained from an earlier study

using household panel dataset, which showed that sweet potato production was more concentrated in Western Kenya than in other parts of the country, and information from key informant interviews (Ministry of Agriculture (MoA) at the national and district level and the Promotion of Private Sector Development in Agriculture (PSDA)². A discussion with the MoA at Rachuonyo South District revealed that sweet potato is one of the major food and cash crops in the district. Kabondo division in the district is considered to have more concentration of sweet potato production than Kasipul, the other division in the district. Other major sweet potato growing areas in the region are Ndhiwa, Rongo, Rangwe, Nyamira (lower elevation) and Kuria districts. Production in Ndhiwa nearly matches that of Rachuonyo South district.

Traditionally, majority of sweet potato producers in Rachuonyo South districts were women, but with growing commercialization, men are increasingly taking part in the production and marketing activities. This confirms that targeting interventions in sweet potato value chain among agricultural value chains in the district would be of much benefit to women, the marginalized group of interest in the study.

2.2 Sampling

2.2.1 Household Survey

One hundred (100) households were sampled and surveyed in the study. The entry point for selecting the households was farmer groups organized around sweet potatoes, since one of the objectives of the study was to understand the role of collective action in enhancing access to markets by women. There were 11 sweet potato farmer groups in Kabondo Division, spread in three Locations; Atela, Kasewe and Wang'chieng. All the 3 Locations were represented in the sample. The households were drawn from 10 out of the 11 farmer groups; 4 from Atela, 4 from Kasewe and 2 from Wang'chieng. The following criteria were used in selecting the groups to include in the sample:

- Number of years group has been in operation; more was preferred
- Group size (number of members); more was preferred
- Diversity in group activities; greater diversity was preferred

The number of households to be interviewed from each of the selected groups was selected proportionate to the total number of members in all the selected groups. A total of 65 households were randomly selected from the list of members of the 11 groups. The remaining

² Promotion of the Private Sector Development in Agriculture (PSDA) is a bilateral technical cooperation programme jointly implemented by the German International Cooperation (GIZ) on behalf of the Government of Germany and the Ministry of Agriculture on behalf of the Government of Kenya. The programme focuses on three thematic areas in agriculture namely, improving policy coordination and the legal framework; value chain development, and promoting resource-friendly technologies.

35 were not members of sweet potato groups selected randomly from the villages where the group members were located.

2.2.2 Focus Group Discussion

Focus group discussions (FGDs) were important in providing information about; sweet potato production and marketing; women's and men's role in the production and participation in the value chain; and other value chain actors and how they interact along the chain. Two FGDs were held with sweet potato farmers in two Locations; Kasewe and Wang'chieng. Participants in the FGDs were men and women producers belonging to sweet potato groups and those with no membership in groups. The participants were also selected on the basis of their active involvement in sweet potato production and marketing. The number of participants in the FGDs ranged from 8-12. Despite the above criteria, women were overrepresented in the FGDs given their more active involvement in sweet potato production and producer groups.

2.2.3 Case Studies

Case studies on sweet potato groups were meant to provide in-depth understanding of the role collective action plays in facilitating market linkages, especially for women. In addition, they were meant to reveal members' perspective on the costs of, benefits of, challenges in, constraints to and opportunities in engaging in collective action. Two sweet potato producer groups – Golden Kitare Women Group and Kabula Women Group in Kasewe and Wang'chieng Locations, respectively - were selected for case study. Their selection was based on group size, diversity in terms of gender and activities and age.

2.2.4 Other Chain Actors

Other chain actors were traders (large scale and small scale) and key informants. Snowballing approach was used to sample traders and key informants. These chain actors were not necessarily confined to the study site, and, therefore, were traced and interviewed where they were located. However, some were interviewed at the study site where they had come to procure sweet potatoes at the time of the study. In total, interviews were conducted with the Ministry of Agriculture staff at Rachuonyo district, PSDA, and 18 traders (6 in Kabondo and 12 in Gikomba market in Nairobi).

2.3 Data Collection and Analysis

Data for the study was collected between 15th and 30th July 2012. A team of 5 enumerators and one supervisor conducted the household survey while another team of three researchers conducted focus group discussions, case studies and interviews with traders and key informants.

Household data analysis was quantitatively analyzed to provide salient characteristics of sweet potato producers. Quantitative information, especially quantities and prices, collected

from traders was analyzed to provide information on margins along the value chain. Qualitative data from FGDs, case studies and interviews with traders and key informants were synthesized and summarized to map the sweet potato value chain, identify and explain constraints and opportunities along the value chain, identify and explain the role of marketing innovations along the value chain, and make conclusions about potential investment areas for integrating women along the potato value chain.

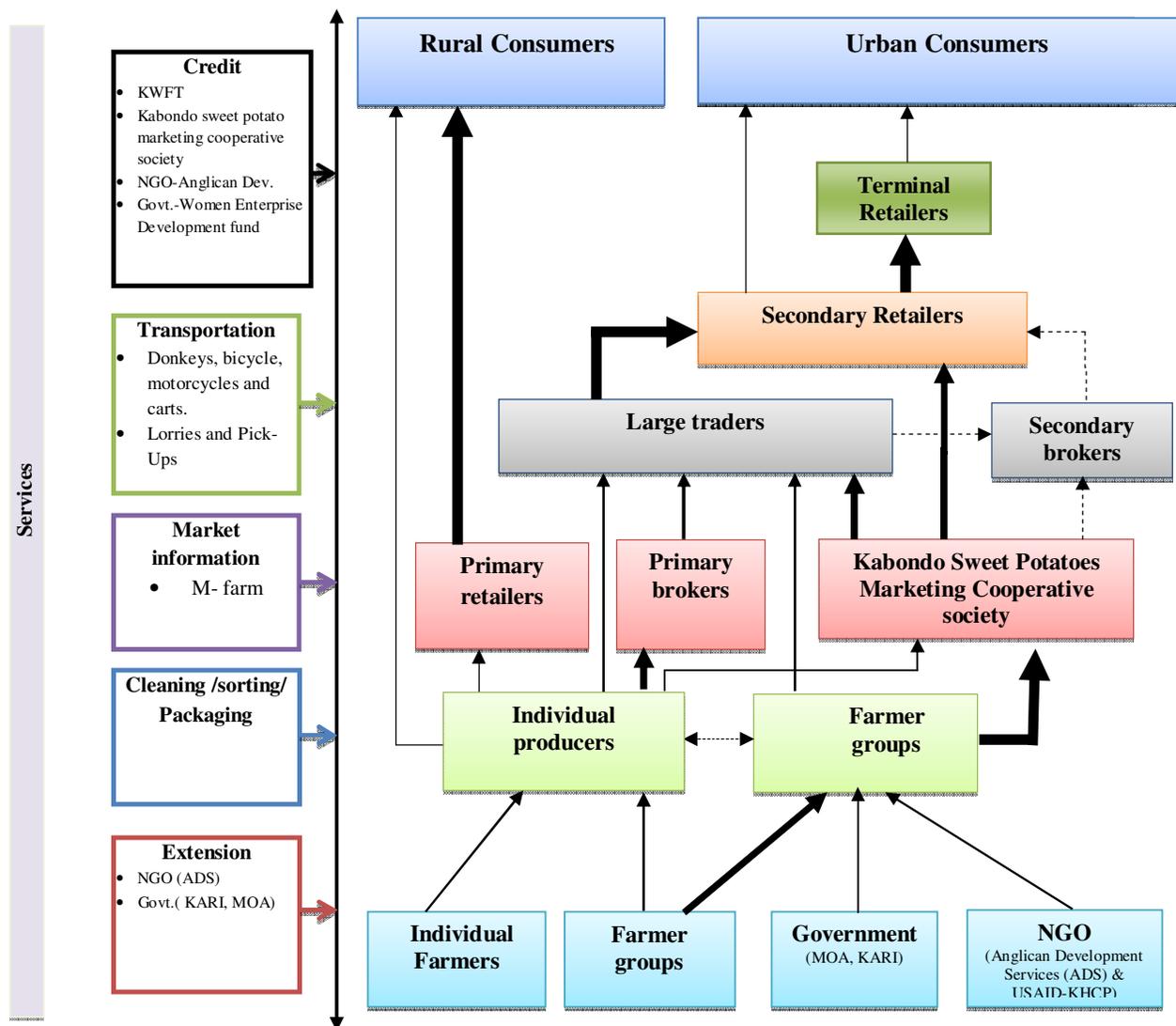
3 SWEET POTATO VALUE CHAIN

Development practitioners make extensive use of the value chain concept for the design of market-driven rural development projects and strategies that seek to integrate disadvantaged groups into markets. A value chain includes the full range of activities, which are required to bring a product or service from conception, through the different phases of production, transformation, and delivery to final consumers and final disposal after use (Kaplinsky and Morris, 2002). The value chain framework is also widely used by researchers, as shown by the increasing number of publications (Fasse et al. 2009) and the large number of value chain handbooks (for an overview see e.g. Nang'ole et al., 2010). A value chain approach is defined as a “Set of interventions by chain actors (buyers, processors, producers) and/or service providers (government agencies, NGOs, consultants, projects) to generate higher value added and create win-win relationships among several chain actors” (Donovan and Stoian, 2011) and in practice employ a range of diverse interventions to reach their goal. This section provides a detailed description of the sweet potato value chain in Rachuonyo South district, with a focus on participation of women along the chain.

3.1 Overview of the Sweet Potato Value Chain

The sweet potato value chain in Kabondo division and the subsequent market outlets along the chain are shown in Figure 2. Sweet potato production is dominantly small scale, with producers mainly being women who produce individually or collectively in groups. Production is both for subsistence and income. The producers rely mainly on fellow farmers or farmer groups for planting materials. The government, through the Ministry of Agriculture and Kenya Agricultural Research Institute (KARI), and the Anglican Development Services (ADS) and the Kenya Horticultural Competitiveness Project (KHCP) funded by the United States Agency for International Development (USAID), promoting sweet potato production and marketing in the area, also provide farmers with planting materials. Producers sell sweet potatoes directly to consumers, primary retailers, primary brokers and to a cooperative society within their locality. They also sell to large traders that buy and transport to secondary markets outside the locality. The large traders sell to secondary retailers in the secondary markets in the urban areas away from the production area. The secondary retailers sell to terminal retailers, who buy in smaller quantities. The terminal retailers break the bags and sell to consumers in smaller units. Analysis of the characteristics and roles of the different chain actors as well as facilitative services along the value chain are discussed in more detail in the next sub-sections.

Figure 2: Sweet potato value chain map in Kabondo Division



Note: Thickness of the arrows represents the volume of flow while broken arrows signify the interaction between actors operating at the same level of market hierarchy

3.2 Input Suppliers

The most important inputs identified in sweet potato production are planting material and labour. While manure use is reportedly uncommon, inorganic fertilizer use is virtually absent in sweet potato production. Farmers have a common belief that inorganic fertilizers should not be applied to sweet potato as this would alter the taste of the tubers. The MOA staff, however, warn that soil fertility is declining and failure to replenish the soil is progressively resulting into yield decline, and poses a threat to sweet potato production both now and in the future.

Suppliers of labor are the producers themselves, either as family, shared or hired labourers. Labour supply for land preparation and harvesting is mainly by men usually using animal-drawn plough, while women supply labour mainly for planting and weeding, the most labour demanding activities.

The main suppliers of planting materials are sweet potato producer. The Government through the MOA and KARI and the ADS and USAID-KHCP also supply producers with planting materials, mainly the orange-fleshed variety. Producers in the area rely on their local social networks to obtain sweet potato vines. The most commonly planted local varieties are *Nyauwo* (also known as *Nyathi Odiewo*), *Kabuti Jolweny* and *Mbubin Jalayo* (these are local names). The ADS, KARI and the USAID-KHCP through the Animal Draught Power Programme (ADDP) played a key role in introducing the orange fleshed sweet potato (OFS) varieties. However, producers prefer the local varieties to the OFS, citing higher productivity, drought tolerance, tubers' long shelf life, marketability (high demand in the market), and early maturity as the reasons for their preference.

Drought is a major constraint to accessing planting materials. Drought results in drying up of vines and makes planting materials unavailable for the season following the drought.

3.3 Producers

3.3.1 Importance of Sweet Potato among Farm Enterprises

Sweet potato producers are the core of the sweet potato value chain since they provide a market for inputs and supply the output market. Producers are dominantly small-scale and rely on rainfall for production. They practice semi-subsistence mixed farming, where they engage in both livestock keeping and production of a range of crop enterprises, but not on fully commercialized basis. The crop enterprises include sweet potato, maize, beans, cassava, sorghum, groundnuts, green gram, sunflower, sugarcane, avocado, banana, mango, and pawpaw. Livestock enterprises include indigenous chicken, cattle, sheep, goat, donkey and bee keeping. From the FGDs, the three agricultural enterprises in order of importance in the study area are maize, sweet potato and cattle.

The ranking of the enterprises, however, differed between men and women in the two Locations in which the study was conducted. In Kasewe Location, women ranked sweet potatoes first, maize second and cattle third, while men listed cattle, maize and sweet potato, respectively, as the most important enterprises. Women see sweet potato as the most important source of food and income for meeting daily/weekly cash needs such as buying sugar, salt, fuel, and larger financial needs such as school fees. Men, on the other hand, attach more importance to cattle due to its use in providing draught power for ploughing and payment of dowry. They also argue that cattle are important in meeting vast financial needs such as high hospital bills. In Wang'chieng Location, women ranked maize, sweet potato, and cattle in that order, while men ranked cattle first, sweet potatoes second and maize third. Men view cattle ownership as a symbol of wealth and are important in meeting huge financial

needs. The cattle are also an important source of ploughing labour. Women view maize as very important in food provision. For women, wealth counts if the household is food secure, but to men social status is considered important.

3.3.2 Characteristics of Sweet Potato Producers

There are two forms of sweet potato production in the study site; individual and collective (through producers groups) production. Individual production is by individual farmers on their own farms, while collective production is by producer groups on group farms. Groups would rent in land for production of sweet potatoes for sale. In addition to sweet potato farming, the groups also engage in other activities. Detailed discussion on collective action by producers is presented in section four.

Sweet potato production in the study site is dominated by women. It was traditionally considered a woman’s crop, but due to increased commercialization occasioned by expanding market in the recent past men’s involvement in sweet potato production is on the rise in the area. Production of sweet potato is favorable to women because the crop is able to provide them with cash for their immediate needs, in addition to its importance in food provision, since women have little control over decisions regarding use and disposal of assets like cattle to meet cash needs.

Overall, crops contribute about 39 percent of household income and 46 percent of income in female headed households, and lower in male headed households (36%) (Table 1). The share of sweet potato in total household income averages nine percent overall and 11 percent in female headed households, while in farm income it averages 21 percent overall and 19 percent in female head households.

Table 1: Household income by gender of household head

Gender	Household total income (KES)	Share of crop income in household income	Share of livestock income in household income	Share of Non-farm income in household income	Share of sweet potatoes in household income	Share of sweet potatoes in farm income
Male (N=71)	157,439	0.36	0.13	0.51	0.08	0.21
Female (N=29)	104,286	0.46	0.16	0.38	0.11	0.19
Total (N=100)	142,025	0.39	0.14	0.47	0.09	0.21

Responsibility for sweet potato production in the producing households is dominated by women (96%) in female headed households and to a large extent by women (48%) in male headed households (Table 2), suggesting that sweet potato in Rachuonyo South district is largely a woman’s crop, in terms of production.

Table 2: Persons responsible for sweet potato production, by gender of household head

Gender of household head	Producer		Total
	Men	Women	
Male (N=71)	52.1	47.9	100.0
Female (N=29)	3.6	96.4	100.0
Total (N=100)	38.4	61.6	100.0

The average age of producers is 48 years, with women older (50 years) than men (45 years) (Table 3). Their education level average six years overall, with women having lower years of education than men. Over 70 percent of the producers are married. Among the women producers, however, 44 percent are widows, suggesting that interventions that target to address constraints in sweet potato value chain would be beneficial to quite a large proportion of vulnerable women.

Table 3: Demographic characteristics of persons responsible for sweet potato production, by gender

Characteristic	Men (N=38)	Women (N=61)	Total (N=99)
Age (mean years)	45.3	50.0	48.2
Education (mean years)	6.8	5.5	6.0
Marital status (%)			
Married	97.2	54.2	70.5
Divorced	0	1.7	1.1
Widowed	2.8	44.1	28.4

Overall, a household owns 2.4 acres, and the difference in land size between male and female headed households is not statistically significant. Over 70 percent of the households own the land they cultivate, either with or without title. The main land preparation method for sweet potato production is animal traction (80%), suggesting the important role of draught animal in sweet potato production. On average, sweet potato is produced on a little less than one acre of land per household, with no statistical difference in land size under sweet potato between men and women producers (Table 4). Similarly, quantity produced and the proportion of production sold of sweet potatoes does not differ statistically between men and women. On average, 70 percent of the quantity of sweet potato produced is sold, suggesting that sweet potato production in the study area is largely for the market.

Table 4: Acreage, production and sales of sweet potatoes, by gender

Producer	Acres planted with sweet potato	Kgs produced	Kgs produced per acre	Share of production marketed
Men (N=38)	0.82	1050	1325	0.63
Women (N=61)	0.87	979	1435	0.73
Total (N=99)	0.85	1006	1393	0.70

Across gender of producer and gender of household head, acreage, quantity produced and marketed proportion of sweet potato do not differ statistically (Table 5).

Table 5: Acreage, production and sales of sweet potatoes, by gender of producer and household head

Gender of producer and household head	Acres planted with sweet potato	Kgs produced	Kgs produced per acre	Share of production marketed
Woman responsible, female headed (N=27)	0.78	878	1361	0.71
Woman responsible, male headed (N=34)	0.94	1058	1494	0.75
Man responsible, female headed (N=1)	1.00	686	686	0.86
Man responsible, male headed (N=37)	0.82	1060	1343	0.63
Total (N=99)	0.85	1006	1393	0.70

3.3.3 Marketing

Regarding sales of sweet potatoes by producers, decisions are mainly made jointly by men and women in a household (Table 6). This is most common especially in male headed households. In female headed households, in which majority of heads are widows, it is the women that majorly make decisions concerning sales. A similar pattern is observed with regards to decision on use of revenue from sweet potato sales; joint decision making by men and women is most common in male headed households while decision making by women alone is most common in female headed households (Table 7). In cases where women are responsible for production, decision on use of revenue from sweet potato sales is made mainly by women (55%) and jointly by men and women (36%) (Table 8). The patterns in decision making concerning sweet potato sales and revenue reinforce the finding that the commodity is substantially a woman's crop, and suggest that interventions to improve the value chain, especially at production level, holding other things constant, would benefit most women.

Table 6: Persons responsible for sales decision on sweet potatoes, by gender of household head

Gender of household head	Person responsible			Total
	Men	Women	Both men & women	
Male (N=62)	24.2	14.5	61.3	100.0
Female (N=27)	3.7	88.9	7.4	100.0
Total (N=89)	18.0	37.1	44.9	100.0

Table 7: Persons controlling revenue from sweet potatoes, by gender of household head

Gender of household head	Person controlling revenue			Total
	Men	Women	Both men & women	
Male (N=62)	22.6	14.5	62.9	100.0
Female (N=27)	3.7	88.9	7.4	100.0
Total (N=89)	16.9	37.1	46.1	100.0

Table 8: Persons controlling revenue, where women are responsible for production

Person controlling revenue	Count	%
Men	5	8.6
Women	32	55.2
Both men & women	21	36.2
Total	58	100.0

The producers have a range of market channels through which they sell sweet potatoes. Marketing of the produce by the producers, however, is largely unorganized. Much of the sales occur at farm gate, although there are instances where the producers would sell at the local market. Overall, the distance to point of sale averages 0.9 kilometers, indicating that sweet potato buyers penetrate into the production villages. The buyers identified at this node of the chain are primary retailers (small traders), large traders, primary brokers, consumers and the Kabondo Sweet Potato Marketing Cooperative Society (KSPMCS). Primary brokers and primary retailers collect sweet potatoes right at the producers' farms while large traders buy mainly at collection centers situated along the tarmac road passing through the production area. The collection centers are not organized, but are designated spots along the tarmac where the large traders pitch tent and wait for producers and primary brokers to deliver sweet potatoes. Producers also sell to the KSPMCS, through organized collection centers. Individually produced sweet potatoes may be sold individually to the KSPMCS, but the produce from collective group farming is sold mainly to the KSPMCS.

From the household survey, small traders (primary retailers), primary brokers and large traders in that order are the most important (in terms of share of purchases) buyers of sweet potato from producers (Table 9). This overall pattern is also observed among women producers. Among men, the share of sales to small traders ranks third, after that for primary brokers and large traders. This may be a reflection of women's limited capacity to meet transport and time costs in delivering the produce to large traders, and thus would find it more convenient to sell at the farm to small traders and primary brokers.

Table 9: Share of sweet potatoes sold to various buyers

Producer	Buyer	Share of sales to buyer
Men (N=34)	Primary retailer	0.18
	Large trader	0.36
	Consumer	0.08
	Primary broker	0.39
	Total	1.00
Women (N=63)	Primary retailer	0.42
	Large trader	0.27
	Consumer	0.06
	Primary broker	0.25
	Total	1.00
Total (N=97)	Primary retailer	0.34
	Large trader	0.30
	Consumer	0.07
	Primary broker	0.30
	Total	1.00

The main reasons cited by households for making sales to the various buyers are presented in Table 10. Better price is the prime reason, followed by proximity to producers. These reasons are expected, as producers would want to ensure adequate reward to their efforts in engaging in production. Because of the bulkiness of the produce and the time and transport costs that would be incurred in delivering the produce to far markets, producers would find it greatly convenient to sell to nearest buyers.

Table 10: Reasons for sale to buyer

Reason for sale to buyer	Buyer (%)				Total
	Primary retailers	Large trader	Consumer	Primary broker	
Better prices	71.9	46.4	40.0	40.7	52.6
Nearest	15.6	7.1	40.0	14.8	15.5
Contractual arrangement	3.1	28.6	10.0	14.8	14.4
Only buyer available	9.4	10.7	0.0	18.5	11.3
Other reasons	0.0	7.1	10.0	11.1	6.2
Total	100.0	100.0	100.0	100.0	100.0

Note: Other reasons include payment in cash, convenience and bulk purchase

However, results from the FGDs show that in Kasewe Location, large traders are the most common buyers of sweet potatoes from producers, followed by primary brokers, while in Wang'chieng Location primary brokers are the most important market outlet for producers, followed by primary retailers (Table 11). The reason primary brokers are most important in Wang'chieng Location is because of their strong local network, which ensures that large traders do not deal directly with producers. This scenario is absent in Kasewe Location. Generally, producers prefer to sell to primary brokers because they pay in cash and buy at the farm thus saving them time and transport costs that would be involved in delivering the produce to the collection centers or distant markets. Large traders, who sometimes purchase on credit, are accused of defaulting in paying producers agreed prices after they sell the produce delivered to them.

The primary brokers, primary retailers and some consumers originate from the production area, but large traders originate from major towns outside the area, notably Kisumu, Nairobi and Mombasa. Majority of the traders buying sweet potatoes from the producers are women.

Table 11: Sweet potato marketing outlets for producers

Location	Buyer	No. of buyers	% of male buyers	% of female buyers	% sold to buyer	Origin of buyer
Kasewe	Primary brokers	Many	20	80	20	Locality
	Primary retailers	Many	0	100	5	Locality
	Large traders	Many	20	80	70	Kisumu, Nairobi & Mombasa
	Consumers	Few	0	100	5	Locality
Wang'chieng	Primary brokers	Many	0	100	70	Locality
	Primary retailers	Many	0	100	15	Locality
	Large traders	Many	20	80	10	Kisumu
	Consumers	Few	0	100	5	Locality

There are neither quantity nor quality requirements imposed by sweet potato buyers. They buy whatever quantity and quality of produce a producer would offer to sell. However, the buyers consider specific attributes in order to grade the produce and determine the price to offer. These attributes include tuber size, skin color, variety, and disease/pest infestation. Large traders categorize the produce into two grades (grade 1 and grade 2) based on these attributes. Larger tubers without bruises and/or disease/pest-free are grade 1 and are priced higher than grade 2, which are smaller, have bruises and/or are disease/pest-infested. Primary brokers, on the other hand, while buying from producers grade the produce into three but sell to large traders in the two grades. However, approximately 90 percent of the sweet potatoes sold are grade 1.

Grading and prices offered to producers are largely determined by the buyers, and so producers are largely price takers, raising concerns about the producers' capacity to negotiate for better terms at this node of the chain. The prices offered vary across buyers, with primary brokers offering the lowest prices while large traders offer the highest prices.

There are no standard units of measure for sweet potato bags. They are packed mainly in 90 kg extended bags, depending on the mutual agreement between the buyer and the seller. The extended bags weigh in excess of 90 kg, but the price is based on the bag not the weight of the produce carried in the bag. The producers lament about this practice, which they view as exploitative.

3.3.4 Opportunities and Constraints Faced by Producers

In the household survey and FGDs, the producers identified the following constraints to and opportunities for growth in sweet potato production and marketing.

Constraints

Constraints in production

The households interviewed identified unfavorable weather, high incidence of pests and diseases, lack of advice on agronomic practices and high cost of inputs, in that order, as the most important constraints they face in sweet potato production (Table 12). Unpredictable rainfall is a problem that not only affects yield but also affects availability of sweet potato vines for planting.

From the FGDs, stringent conditions and requirements by formal institutions for accessing credit from financial institutions which many sweet potato producers are unable to meet, given their resource constraints was also identified. This constraint is especially more severe for women, given their chronic resource constraints, and compounds their inability to access capital for investment in sweet potato production.

Table 12: Production constraints reported by households

Constraints	N (responses)	Gender of person responsible		Total
		Man	Woman	
Unfavourable weather	72	36.4	33.6	34.8
High incidence of pests	35	11.7	20.3	16.9
High incidence of disease	27	14.3	12.5	13.0
Lack of agronomic advice	25	11.7	11.7	12.1
High cost of inputs	21	11.7	9.4	10.1
Lack of clean planting material	13	9.1	4.7	6.3
Other constraints	12	3.8	7.0	5.8
No constraint	2	1.3	0.8	1.0
Total	207	100.0	100.0	100.0

Constraints in marketing

In marketing, households view low prices and lack of demand for sweet potatoes as the main constraints (Table 13). The reason households cited these two as the main constraints in marketing is because of seasonality in production, where all producers enter the market at the same time, creating a glut in the market. Oversupply in the market manifests in low prices and what would appear as low demand. Other marketing constraints cited include unfavorable contractual agreements with buyers and high cost of transport.

Table 13: Marketing constraints reported by households

Constraints	N (responses)	Gender of person responsible		Total
		Man	Woman	
Low prices	91	48.1	46.5	47.2
Lack of demand	52	28.6	26.3	26.9
Unfavourable contractual agreements	19	14.3	6.1	9.8
High cost of transport	18	3.9	13.2	9.3
Other constraints	9	3.9	5.3	4.7
No Constraint	4	1.3	2.6	2.1
Total	193	100.0	100.0	100.0

Other marketing constraints facing producers as identified in the FGDs are:

- Lack of storage facility for sweet potatoes. Sweet potato is perishable and has a shelf life of a little more than a week. This means that producers have to sell immediately they harvest, which results in low producer prices due to increased supply in the market at once.
- Poor feeder roads, which makes transport to the market difficult and costly
- Availability of water for cleaning sweet potatoes is a concern, especially when volumes are large. This constraint is specifically faced by women who do the work.
- Lack of proper sweet potato standard packaging units, resulting into exploitation by traders

- Unorganized spot markets, where producers have little bargaining power on setting grades and prices, hence low producer prices

Opportunities

Some of the opportunities identified by the producers include the following:

- Increasing demand for sweet potato, especially in urban centers, as a result of increasing population and urbanization and health awareness on the importance of traditional foods, points to promising growth prospects of the market for the commodity
- Efforts by various stakeholders, including the government to promote traditional high value crops including sweet potatoes, offer opportunity for enhancing producers' agronomic and management practices in sweet potato production, and have the potential of increasing both the quantity and quality of production
- Improvement in road infrastructure that links production areas and major urban towns presents an opportunity for better market access.

3.4 Primary Brokers

Brokers operate at both primary and secondary market levels. Primary brokers, operating at the primary market, play a very significant role in collecting sweet potatoes from producers at the farm gate, bulking and selling to large traders. The brokers at that level act as a link between sweet potato producers and large traders. Brokers at the secondary market, on the other hand, link large traders and secondary retailers at that market.

Primary brokers usually buy sweet potatoes from the farm gate and sell to large traders. They move from farm to farm collecting sweet potatoes from individual producers and transport them at their own cost to collection centers along the tarmac road for sale to large traders. This saves producers the cost of transporting the produce to the collection or local trading centers, although the prices the producers receive are lower compared to what they would receive if they transported the produce and sold directly to large traders. It was reported that virtually all primary brokers in the study site are women. The primary brokers handle a limited number of bags, ranging from 20 to 80 extended 90 kg bags (jumbo bags, as they are popularly known) per month. There is usually no contractual arrangement between producers and primary brokers.

While buying from producers, the primary brokers categorize the produce into three grades, and the prices offered depend on the grade. However, they sell to large traders in two grades. This practice is perceived by the producers as exploitative, since the lowest grade (grade 3), from which the farmers receive very low prices, ends up as grade 2 when brokers sell to large traders.

An overlap in activities was reported between primary brokers and producers, whereby some brokers also double as sweet potato producers. The primary brokers that double as producers are mainly those that have links with large scale traders. The large traders make prior arrangements with them to collect for them specified amounts of sweet potatoes, although the large scale traders do not necessarily pay in advance, so the brokers procure using their own money.

Besides buying and selling sweet potatoes, some of the brokers also traded in other agricultural commodities such as vegetables, bananas, pineapples and maize as a way of minimizing risks in their business. This diversification also ensures that they remain occupied in business throughout, since sweet potato trading in the study site is seasonal; it takes place in May/June and September/October, with May/June being the busier season.

Majority of the primary brokers have no formal contractual agreement with producers of sweet potatoes, although some informal/verbal agreements between primary brokers and producers were reported in Wang'chieng Location. In this case, brokers extend credit to producers towards purchase of inputs for sweet potato production with the agreement that the output thereof is sold to the primary broker who deducts from payment due to producers the value of credit offered. Usually it is the producer that initiates such an agreement. The duration of the agreements is between 5 to 7 months depending on the growing period of the sweet potato variety cultivated. The terms of the agreement include presence of the broker during harvesting time and prohibition of the producer from selling the output to a different buyer. In case of breach of contract, local administration officials, mainly Assistant chiefs or Chiefs are called upon to arbitrate between the affected parties. Resolutions would involve agreement on modalities of payment by the party that breached the agreement. Although it is the producers that usually initiate such agreements, they are concerned that the brokers have more control over pricing of the produce. This makes the producers feel they are losing out on such agreements, hence they are not popular.

3.5 Primary Retailers

Primary retailers operate like primary brokers in the sense that they buy sweet potatoes directly from the producers and sell to consumers at the local trading centers and/or at strategic locations along the tarmac road passing through the production area. The primary traders deal in small volumes (less than 25 bags per month), and often sell in smaller units, usually *debes*, to consumers. Because they deal in small quantities and sell in the local trading centers, competition for sweet potatoes between retailers and primary brokers is minimal.

3.6 The Kabondo Sweet Potatoes Marketing Cooperative Society

The Kabondo Sweet Potatoes Marketing Cooperative Society (KSPMCS) is a producer organization through which producers market their sweet potatoes collectively. In addition to helping its members market their produce, the cooperative also facilitates training of its

member producers on financial matters, especially saving and agronomic management of sweet potatoes, and offer credit services to the members. Membership in the cooperative is either individual or through producer groups.

The cooperative has organized collection centers (CC) for sweet potatoes, with each collection center manned by collection centre representatives (CCR) who manage and keep records of volumes of produce delivered by members, volumes sold and price information. They also keep data on acreage of sweet potatoes planted by member producers, planting dates and expected harvesting dates.

The cooperative buys sweet potatoes from its members at agreed prices, which usually are higher than what other buyers offer, looks for the market and sells the produce at prices higher than the buying price from the members. The profit obtained by the cooperative through this arrangement sustains the cooperative's operations and also contribute towards dividends paid to members at the end of each year.

While collective marketing through the KSPMCS offers producers better prices, some cooperative members sell directly to large traders. They take advantage of the linkages the cooperative has made with the large traders to access the traders. The reasons some individual cooperative members do not sell to the cooperative include: a) there is transport cost involved in delivering the produce to the CC and b) not all payment for sale to the cooperative may be made at once. Sometimes the cooperative pays for part of the sales immediately and the remainder is paid later after the produce is sold. The practice of bypassing the cooperative to sell directly to large traders is being encouraged by the traders, since they pay lower prices when they buy directly from individual producers. There are instances of collusion by the large traders not to buy at all from the cooperative, making it difficult for the cooperative to find a market for the members' produce. Therefore, the cooperative actively looks for the market in major urban centers such as Nairobi, Kisumu and Mombasa. However, accessing these markets also has challenges due to opportunism by cartels of brokers, as discussed later in this report.

3.7 Large Traders

Large traders are the main link between the primary market and the secondary market, which mainly are the major urban centers, notably Kisumu, Nairobi and Mombasa. The large traders buy sweet potatoes in bulk from primary brokers, individual producers and producer groups and the KSPMCS mainly under spot market arrangement and transport it for sale to the secondary markets. A few have semi-organized marketing arrangements with their suppliers, mainly the primary brokers, where they enter into verbal informal arrangements with the suppliers. Also, some of the interviewed large traders confirmed to have offered credit services to sweet potato producers under informal contractual arrangements that they would supply them with sweet potatoes after harvesting. These arrangements, however, are not popular due to limited direct contacts between the large traders and producers. Another arrangement reported between large traders and primary brokers and producers is advance

payment of some amount of money by large traders to brokers or producers for the supplies before harvest as way of securing the produce. They handle hundreds of jumbo bags of sweet potato per month, depending on the supply and demand circumstances.

In some instances, large traders do not necessarily physically travel to the production area to collect sweet potatoes. Instead, they make arrangements with primary brokers at the production area who bulk and transport to them the commodity to the secondary markets. In such instances, communication between the primary brokers and large traders is usually through phone and payments are made through mobile money transfer services.

3.8 Secondary Brokers

Secondary brokers operate at secondary markets in major urban markets such as Kisumu, Nairobi and Mombasa. These brokers have strong cartel-like networks in those markets and control the way buyers and sellers interact in the markets. For instance, an interview with large traders of sweet potatoes at Gikomba market in Nairobi revealed existence of cartels of brokers who control the market for sweet potatoes at the market, and any trader who delivers sweet potatoes for sale must pay to the brokers a fee of KES 100 per bag, which is even higher than the market cess (KES 60 per bag). Also, the traders do not directly interact with buyers, but only through the brokers. For instance, the KSPMCS once delivered sweet potatoes to Gikomba market for sale but was not allowed by the brokers to sell because it tried to bypass the secondary brokers. The large traders were part of the move to block the KSPMCS from selling sweet potatoes since the KSPMCS was seen as additional competitor at the secondary market. The opportunistic behaviour by the secondary brokers adds to the cost of doing sweet potato business at the secondary market.

3.9 Secondary Retailers

The secondary retailers are the link between the large traders and terminal retailers. They buy from large traders through secondary brokers and sell to terminal retailers. Usually, secondary retailers do not interact directly with large traders and do not negotiate prices with them, but do so with secondary brokers who sell on behalf of the large traders. No contractual agreements between secondary retailers and large traders were encountered during the study.

3.10 Terminal Retailers

The terminal retailers buy from secondary retailers and sell to final consumers at retail markets and residential estates spread in the urban centers. The terminal retailers break the bags and sell to consumers in smaller units such as *debes* and heaps. Usually, there are no contractual agreements between the terminal retailers and the secondary retailers.

3.11 Consumers

Sweet potato consumers consist of rural and urban consumers. The rural consumers are usually local residents or visitors in the production area who buy in small quantities for

consumption. Urban consumers include individuals who purchase sweet potatoes at the retail markets and estates in the large towns, mainly Nairobi, Kisumu and Mombasa. The increasing demand for sweet potatoes is an indication of increasing consumption of sweet potatoes. The commodity was long viewed as an inferior food, more of a snack than a proper staple, and carried a stigma of being “famine” food for the poor. This perception is progressively changing as awareness of health benefits of traditional food commodities is increasing, and the commodity’s consumption is increasing among urban consumers, both rich and poor. It is one of the traditional crops also sold in modern retail outlets such as supermarkets.

3.12 Opportunities and Constraints Faced by Sweet Potato Traders along the Value Chain

Interviews with sweet potato traders identified the following constraints and opportunities for growth in the sweet potato value chain.

Constraints

- Fluctuation in supplies, mainly due to erratic weather patterns. This results into highly fluctuating prices
- High transport costs especially during the rainy season. In some instances transport services are limited
- Opportunistic behavior by brokers both at the production area and in major urban markets acts as a barrier to proper negotiation between suppliers and buyers
- Lack of credit services for business expansion
- Pests and diseases affect quality of tubers, which in turn influences marketability of sweet potatoes
- Lack of storage facilities to prolong shelf-life of sweet potatoes leads to losses along the marketing chain
- Poor feeder roads within the production area, which increases the cost of moving sweet potatoes to collection centers

Opportunities

- Demand for sweet potatoes is available and increasing. This offers opportunity for trade expansion in the commodity
- Promotion of production of quality tubers through training of producers on modern farming technologies can be considered to increase supply in the market
- Suitable storage facilities can be constructed along the value chain to minimize losses and also smooth supply of the commodity in the market. This will also reduce price fluctuations

- Standardization of sweet potato packaging units will remove unfair practices and streamline the units of measure along the value chain
- Making available affordable credit services for business expansion
- Increasing supply of clean water in the production area for cleaning sweet potatoes

3.13 Value Chain Enablers/Facilitators

Sweet potato value chain requires other services to facilitate smooth operations and flow of the commodity. The following facilitative services were identified along the chain.

3.13.1 Technical Support Services

Technical support services include extension services by the government and advisory and business development services from NGOs and development agencies such as the ADS, the Swedish Cooperative Centre-Vi Agroforestry (SCC-Vi Agroforestry) and USAID-KHCP. The MoA has been offering training to producers on agronomic management of sweet potatoes. The Kenya Agricultural Research Institute (KARI) in partnership with ADS and USAID-KHCP has also been offering extension services with regards to selection and multiplication of clean planting materials. In collaboration with the producers, the MOA, the Ministry of Cooperative Development and Marketing, the ADS and USAID-KHCP work in support of producers with regards to marketing. In particular, the Ministry of Cooperative Development and Marketing, the ADS, USAID-KHCP were instrumental in the formation the KSPCMS. Producers also receive market information from private organizations, particularly the M-Farm Ltd which provides sweet potato price information across different markets to producers. Producers do not pay for the technical support services provided by the government and the NGOs, but they pay for the market price information provided by the M-Farm Ltd.

3.13.2 Financial Services

Notable financial services provided especially to producers are credit and training on financial management. These services are essential for especially producers to enable them obtain inputs and produce for the market. Some of the financial service providers mentioned by the producers include producer groups, produce buyers, the KSPCMS, ADS, Churches, Micro-finance Institutions, especially the Kenya Women Finance Trust, and the government through the Youth Enterprise Fund and Women Enterprise Fund. Despite the existence of a range of financial service providers, the cost of credit, in terms of interest charged and conditions for access, is quite high to producers. The high cost of credit has made producer groups and KSPCMS the most popular sources of credit among sweet potato producers.

Sweet potato traders also cite high cost of credit as one of the constraints they face in their efforts to expand their businesses.

3.13.3 Transport Services

Transport services are offered by individual producers as well as specialized transport service providers who help in the movement of sweet potatoes from one market level to another. Modes of transport from the farms to the local sale points are donkeys, bicycles, motorcycles and carts. Transport to distant markets is by motor vehicles, mainly lorries, canters and pick-ups. Transport services are charged on the basis of the distance and number of bags of sweet potatoes transported. Interviews with traders identified collective hiring of transport means by individual traders as an innovative way of lowering the cost of transport to distant markets. Transport service providers are usually men.

3.13.4 Loading and Off-loading Services

Loading and off-loading of sweet potatoes is done by men, because it demands use of a lot of physical energy due to the sizes and weight of packaging bags. Loading and off-loading services are charged per bag. The cost of loading sweet potatoes to a vehicle is borne by the buyer.

3.13.5 Cleaning and Sorting Services

Sweet potatoes are washed using water after harvest to remove soil from the tubers and thereafter the tubers are sorted into different grades according to agreement between the producer and buyer. Cleaning and sorting is normally done by women and the cost is borne by the buyer. Unavailability of adequate clean water is a constraint for the women. It also raises health concerns due to questionable hygiene.

3.13.6 Packaging Services

The cleaned and graded sweet potatoes are packaged into gunny bags, usually 90 kg extended bags, which weigh as much as 130 kg. The packaging services are provided by men, who also provide loading services. The buyers pay for these services.

3.14 Women's Participation in the Sweet Potato Value Chain

Women's participation in the sweet potato value chain is extensive. Supply of planting materials through social networks is dominated by women. Women also dominate production, where they engage in the general management of the crop and supply planting and weeding labour. Primary as well as secondary trading in the commodity is also dominated by women. However, broking at the secondary market is dominated by men. Box 1 summarizes women's participation in the sweet potato value chain.

Box 1: Women's Participation in sweet potato value chain

Node	Women's level of participation	Activities by women
Input supply	Majority	<ul style="list-style-type: none"> • Multiplication and selection of vines. Women are more able to identify quality planting materials than men, and are more knowledgeable about sweet potato diseases. The existing social networks among women created through group activities help them access planting materials more easily
Production	Majority	<ul style="list-style-type: none"> • Women own much of the production and supply planting and weeding labour, and general management of the crop • Sweet potato is favorable to women because it provides cash for immediate needs, in addition to its importance in food provision.
Primary trading	Over 80 percent of primary brokers and retailers are women	<ul style="list-style-type: none"> • They collect produce from the farms and sell in local trading centers and to large scale retailers • The capital outlay required for retail trading is not much
Secondary trading	About 80 percent of traders are women	<ul style="list-style-type: none"> • Large traders buy in larger quantities from the production area and transport for sale in the urban markets in Nairobi, Kisumu and Mombasa, while secondary retailers buy from the large traders in the urban markets and sell to terminal retailers • Because of the large capital required for large trading, the proportion of women at this node of the chain is comparatively lower • But brokers at the secondary market are men
Terminal retailing	Majority	<ul style="list-style-type: none"> • These buy from secondary traders and break the bulk to sell to consumers in smaller quantities

3.15 Producer and Trader Costs and Margins

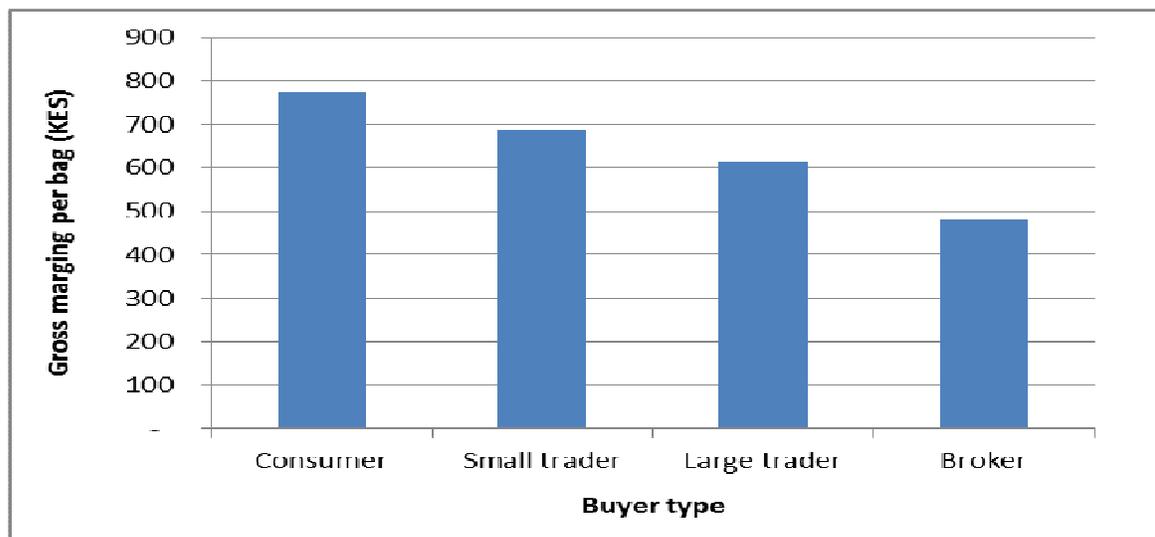
As discussed above, sweet potato in Rachuonyo District has a relatively long chain with many actors. Each of the actors along the chain has costs to incur and is in business to earn profit. The costs incurred by the actors and the margins they make are reflected on the buying and selling prices. Production cost of sweet potatoes averaged KES 530 per 90 kg bag in 2011/2012 cropping year (Table14). About 77 percent of the cost was on hired labour, mainly land preparation and harvesting. Revenue per bag, computed as the gross value of production per bag, averaged KES 1147. The gross margin per bag was KES 617 on average.

Table 14: Producer cost of production, revenue and gross margin (N=98)

	Mean	Std. Deviation
Cost of production per bag (KES)	530	495
<i>Share of seed in total cost</i>	0.030	0.117
<i>Share of rent in total cost</i>	0.067	0.144
<i>Share of other inputs in total cost</i>	0.023	0.099
<i>Share of transport in total cost</i>	0.015	0.104
<i>Share of hired labour in total cost</i>	0.774	0.332
Revenue per bag (KES)	1,147	442
Gross margin per bag (KES)	617	679

Depending on the sales outlet by the producers, gross margin ranged between KES 481 and KES 774. Gross margin was highest where sweet potatoes were sold to consumers and lowest where sales were made to primary brokers (Figure 3). Obviously, it appears primary brokers offer the lowest prices to the producers.

Figure 3: Producer gross margin per bag, by buyer type



The average prices, margins and costs for sweet potato vary along the chain post production, depending on the grade (Table 15). The marketing margins were highest for secondary retailers and large traders, and lowest for terminal retailers. Returns per bag (calculated as the percentage of net margin over the sum of buying price and marketing costs) was highest for large traders and lowest for terminal retailers. Margins are dependent on the grade; grade 1 fetches higher margin than grade 2. Although the produce is graded from the point at which the primary broker buys from the producer, the grades are disintegrated by the secondary retailer while selling to the terminal retailer.

In general, transport cost is the main component of the marketing costs for the various actors along the chain (Figure 4). Transport costs increase with increase in distance to the market; it is highest between primary and secondary markets.

Table 15: Costs and margins per 90 kg bag extended along the value chain

	Primary broker (Buying from Producer)		Large trader (Buying from Primary broker)		Secondary retailer (Buying from Large trader)		Terminal retailer (Buying from Secondary retailer)
	Grade1	Grade2	Grade1	Grade2	Grade1	Grade2	No grade
Buying price	1500	500	1800	700	3300	1800	4000
Selling Price	1800	700	3200	1600	4000		4600
Marketing cost	100	100	870	870	150		150
Net margin	200	100	530	30	550		450
% return	12.5	16.7	19.9	1.9	15.9		10.8

Figure 4: Share of marketing cost components along the sweet potato value chain



4 COLLECTIVE ACTION AND USE OF ICT ALONG THE VALUE CHAIN

In this section we discuss the role of collective action and use of ICT identified along the value chain that helps improve market linkages. The motive is to identify potential investment areas to improve the capacity of collective action and ICT innovations to facilitate and maintain market linkages for the benefit of women. The focus is mainly on collective action at the producer level and use of information and communication technology (ICT) along the entire value chain.

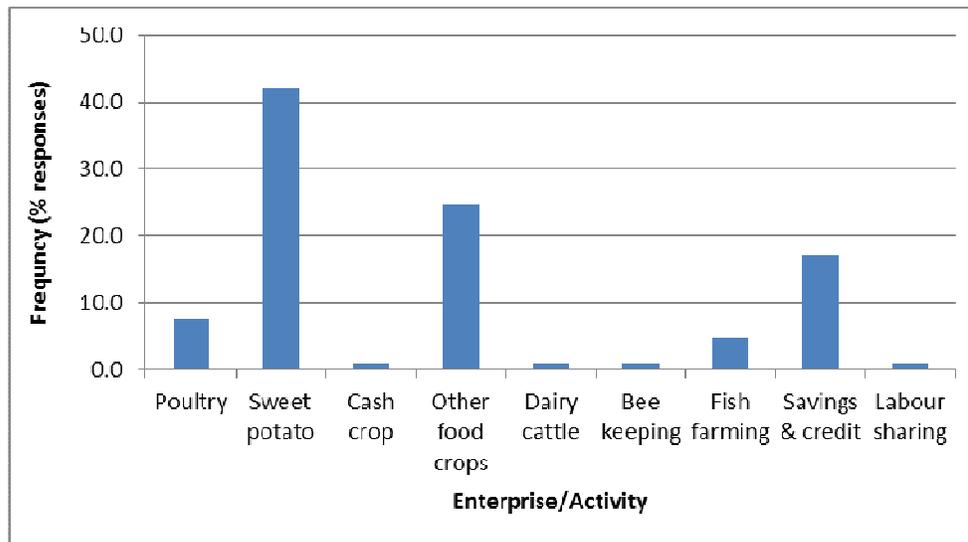
4.1 Collective Action

Collective action involves any pursuit of goal(s) or action(s) aimed at improving conditions of group members. Collective action, therefore, occurs when more than one individual is called upon to contribute to an effort for the achievement of a defined outcome (Elinor Ostrom, 2004). This means that there has to be interdependence among participants, so that the contributions or efforts of one individual influence the contributions or efforts of others. The most common types of institutions for collective action among the farming community in Kenya include registered and unregistered producer groups and cooperative societies. Such institutions of collective action have been advocated to ameliorate smallholder producer experiences. Sizeable empirical evidence has shown that given necessary support, collective action could lead to improved welfare of producers with more emphasis on the market participation. Collective action helps to address rural market imperfections and market failures caused by high transaction costs and information asymmetry by enhancing the bargaining power of the producers, coordinating production to synchronize it with seasonal pricing conditions and thereby facilitating improved market access (Shiferaw, 2006). However, collective action has implication on transaction costs too and time demands on participants. Kangazi et al., (2009) argue that collective action in high value crops and or markets with tight standard requirement is likely to bear higher cost of organizing. Therefore, benefits of collective action must exceed cost of participation for collective action to be successful. In addition, high cost of organizing could lead to collective action problems. We present below information on sweet potato producers' participation in collective action. We also present case study reports on institutions of collective action among the sweet potato producers, with a view to identify constraints and potential areas of investment that could stimulate the institutions to improve market linkages for women in the sweet potato value chain.

4.1.1 Sweet Potato Producers' Participation in Collective Action

About 95 percent of the sweet potato producers interviewed were members of groups. Although the groups are recognized as agricultural, savings & credit, community or religious, they deal in a range of activities (Figure 5). Sweet potato and other food crops (such as maize) enterprises, and savings & credit activities are the major areas of engagement by the groups.

Figure 5: Enterprises and activities by the groups



Agricultural groups, which are the most common among the sweet potato producers, offer mainly savings & credit services and training on agricultural matters (Table 16). These trainings are mainly on agronomic practices. We observe little engagement in marketing activities by the groups, as reported by the producers. This is consistent with the findings above that majority of producers sell their sweet potatoes individually rather than collectively.

Table 16: Services offered by groups

Services	Group type				Total
	Agricultural	Savings & credit	Community	Religious	
Savings & credit services	46.4	93.1	34.0	50.0	68.6
Community welfare needs	3.6	2.9	54.0	50.0	10.9
Agricultural training	29.5	0.6	0.0	0.0	10.1
Market information	8.0	1.1	10.0	0.0	4.7
Marketing	8.0	0.0	0.0	0.0	2.7
Input purchases	1.8	2.3	0.0	0.0	1.8
Provision of farm labor	2.7	0.0	2.0	0.0	1.2
Total	100.0	100.0	100.0	100.0	100.0

Producers reported a range of benefits they obtain from participating in the groups (Table 17). Overall, credit and information, in that order, are the two main benefits producers obtained from participating in the groups. For agricultural groups, ready market, where they are dealing in marketing of agricultural produce, is also an important benefit producers derive. Support from community and religious services are the main benefits obtained from community and religious groups, respectively.

Table 17: Benefits derived from participating in groups

Benefits	Group type				Total
	Agricultural	Savings & credit	Community	Religious	
Credit	35.0	83.1	11.8	0.0	50.4
Information	32.0	8.5	21.6	33.3	20.1
Support from community	1.0	3.4	58.8	16.7	12.9
Ready market	13.6	0.0	0.0	0.0	5.0
Business management skills	2.9	0.8	7.8	0.0	2.9
Religious services	1.0	0.0	0.0	50.0	1.4
Other benefits	14.6	4.2	0.0	0.0	7.2
Total	100.0	100.0	100.0	100.0	100.0

Sweet potato producers cited inadequate access to credit services as one of the constraints they face in their production activities. This is confirmed by the active engagement by the producer groups in savings and credit services. The question is how active these groups are in offering credit services to their members. Results show that out of the sweet potato producing households interviewed 79 percent applied for some credit, and 95 percent of the applicants received the credit. About 58 percent of the applicants needed credit for agricultural production, out of which 28 percent needed it for sweet potato production. The most common sources of credit for the producers were producer groups, both registered³ and unregistered (Table 18), confirming that collective action plays a major role in addressing credit constraints for the sweet potato producers.

Table 18: Sources of credit for sweet potato producers

Credit source	N	Agricultural	Non-agricultural	Overall
Relative/friend	7	4.3	7.1	6.0
Commercial bank	1	0.0	1.4	0.9
Group (registered)	55	52.2	44.3	47.4
Group (unregistered)	45	37.0	40.0	38.8
MFI	4	0.0	5.7	3.4
Agrovet/Shopkeeper	4	6.5	1.4	3.4
Total	116	100.0	100.0	100.0

Note: The *N* is high because individuals had several sources of credit

4.1.2 Case Studies on Collective Action

A greater depth of understanding of how collective action institutions operate in support of producers' linkage to markets is important in providing learning on best practices by the institutions and identifying areas for improvement to enhance their capacity to better serve its members. We conducted case studies on two producer groups – Golden Kitare Women Group and Kabula Women group - and the Kabondo Sweet Potatoes Marketing Cooperative Society (KSPMCS) for that purpose. We present below a summary of the activities the groups deal in, challenges they face and factors that were identified to be important in making the groups

³ Registration here refers to being officially enrolled with the government Ministry in charge of social services

and the cooperative successful. We also identify potential investment areas for improving their capacity to better serve their members, especially with regards to integrating them in the market for sweet potatoes. Detailed information about the groups is presented in the annexes.

Activities

The activities by the groups and the cooperative revolve around production and marketing. For the two groups, they engage not only in the sweet potato enterprise but also other agricultural enterprises.

- The groups and the cooperative enhance the capacity of their members, who are mainly women, to produce for the market by facilitating their access to better production technologies, skills and inputs
- They facilitate their access to information, both for production and marketing
- The groups and the cooperative expand the scope of women's financial services, especially savings and credit, as these services are core in their objectives. These two financial services are very important in economic empowerment of women, as accumulation of savings can help them acquire productive assets and credit enables them purchase inputs for production and meet other needs
- Participation in collective action builds women's capacity to manage their production and marketing activities
- The groups and the cooperative facilitate women's access to better markets which offer better prices for their produce

Challenges

In their operations and providing services to members, the groups and the cooperative face the following challenges in sweet potato production and marketing, which if solved, would enhance their performance.

- Reliance on rain-fed production of sweet potatoes in the face of increasingly unpredictable weather poses a challenge
- Poor feeder roads is a hindrance to timely transportation of sweet potatoes to the market, and results into high transport costs and losses
- High cost of animal traction is a constraint, especially among women most of whom do not own cattle and ploughs
- Inadequate access to credit is blamed on scarcity of credit facilities in the area and those that are available have stringent conditions and are expensive, which majority of

group members are unable to meet. Some of the requirements in applying for credit include making available things like title deed and fixed assets as security, which many farmers especially women do not have

- Lack of information, especially among low educated women, hinders them from applying for credit since they do not understand terms of loan. Long application procedures also discourage them from applying for loans
- Diseases and pest infestation of the sweet potatoes is becoming a concern to production of quality sweet potatoes. Low quality tubers are hard to market and are of low value
- Opportunistic behavior by some value chain players is a concern in marketing. For instance, cartel-like network of brokers especially in major urban markets make penetration to buyers in those markets impossible. The brokers exploit the cooperative and other suppliers to the markets
- Buyers sometimes opt to buy sweet potatoes from non-cooperative members, usually at lower prices
- Lack of storage facilities for sweet potatoes in the production area, forcing immediate sale of the produce hence low prices due to oversupply

Success factors

In spite of the challenges outlined above, the Golden Kitare and the Kabula Women Groups view themselves at least successful in their operations, and the members attribute the success to the following:

- Diversification of economic activities by the groups has strengthened their financial resource base to be able to offer members financial services
- Well-established and clear rules and regulations governing membership and participation in the groups' activities by members. The rules and regulations ensure conferment of costly penalties to those who go against them, and also builds confidence among members
- Good governance, guided by the established rules and regulations. Good governance has been ensured through democratic and transparent election of group leaders, and holding the leaders accountable to the groups
- The process of decision making, which ensures that all group members are involved and participate in all the group's decision, has motivated members' commitment to the activities of the group
- Registration of the groups with the Ministry of Social Services has enabled the groups to obtain financial services from financial intermediaries

For the KSPMCS, some of the factors that have contributed to its success include:

- Positive response by community members to the formation of the cooperative society, which has seen overwhelming participation of individual sweet potato producers and producer groups in the cooperative's activities
- Support from development organizations and the government (ADS, USAID-KHCP and KARI) through activities to promote sweet potato production and marketing
- The members are embracing a saving culture and business oriented farming of sweet potatoes. This has come as a result of the training services the cooperative provides to its members through the support by the government and development organizations

4.1.3 Potential Actions to Improve the Capacity of Collective Action Institutions

In order for the collective action institutions to better provide benefits to women, the challenges enumerated above need to be addressed. Women can only benefit from participation in the market if they are able to produce for the market. Therefore, challenges regarding production need to be addressed. The need for training of producers on good agronomic practices in sweet potato production cannot be overemphasized. Also, ensuring timely access to clean planting materials by producers is important. Enhancing the capacity of the producers in the above respects through organized groups would hold promise for shared learning and sustainability.

Concerning marketing, much needs to be done in the collective action institutions. The groups, except the KSPMCS, engage in diverse activities aimed at enhancing the welfare of members in general, but are not very active in collective marketing of their sweet potatoes. From the household information, it was observed that majority of the producers sold their sweet potatoes to brokers. The producers would benefit more if they had better bargaining strength. Concerted efforts may thus be needed to engage with the already established and well managed groups to sensitize members on the benefits of collective marketing of sweet potatoes.

Offering financial services to members is one of the most important activities in which collective action institutions engage. In fact, most of the collective action institutions in the study area were established out of the need to enhance the welfare of poor women in the community. Therefore, strengthening the capacity of these groups to offer financial services to their members, which in turn would enhance the capacity of their members to produce for the market, would be beneficial.

4.2 Information and Communication Technology

Use of modern information and communication technology (ICT) was found to be one of the important facilitative innovations in the sweet potato value chain. The innovations are used to reduce transaction costs involving search for market information, physical access to the

market and pecuniary transaction. The two major ICT services encountered in the sweet potato value chain were mobile money transfer (M-Pesa, Airtel money among others) and mobile market price information services by MFarm Ltd.

The mobile phone communication and money transfer technology have facilitated easier, cheaper and faster communication and transfer of payment between buyers and sellers. Through mobile phone communication service, large traders are able to place orders with producers and primary brokers and make down payment using mobile money transfer. Primary brokers are also able to communicate with producers spread in the villages to enquire about produce availability and make payments through mobile money transfer. A mobile phone, therefore, is an essential tool in the marketing of sweet potatoes.

Sweet potato producers in Kabondo Division were also using market price information services offered by a private firm, the MFarm⁴ Ltd. The service, known as M-Farm, enables sweet potato producers to enquire real-time market prices of sweet potatoes and other crops in different regions and markets in the country. The price information is accessed by sending an SMS to 20255 depending on the commodity and market of interest. The service is charged at a cost of KES 1 per SMS and is available to Safaricom subscribers only. This service is aimed at facilitating flow of market information by providing farmers and traders with price information on selected crops especially horticulture, tubers and cereals at reasonable cost.

The market information is obtained by M-Farm data enumerators (stationed at the 5 major markets i.e Kisumu, Nakuru, Nairobi, Eldoret and Mombasa) who record wholesale commodity prices and relay the same to the firm's data repository centre in Nairobi. The data is moderated on real-time basis to check for errors and consistency. The market price data is collected on all days in a week except on Sundays.

Information on sweet potato prices in various markets may indicate to producers the demand trends and may help them price their commodities appropriately. However, as explained earlier, because of less bargaining power producers are majorly price takers and pricing is controlled mainly by brokers and large traders.

Despite the availability of the ICT tools and services for use by sweet potato producers, two challenges exist. First, poor producers still find it difficult to access market information through ICT due to associated costs and lack of ownership of mobile phones. Secondly, low literacy level subdues the use of ICT services among some producers. This is especially so for elderly women with low level of education. However, collective action can help create synergies for improved market access through market information sharing among group members.

⁴ About M-farm go to <http://mfarm.co.ke/about> for more information.

5 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The analysis of the Kabondo sweet potato value chain has revealed strengths and opportunities that if harnessed have the potential to integrate women more in the sweet potato value chain and improve their welfare through potential benefits from the improved value chain. However, the strengths and opportunities along the value chain exist alongside weaknesses which need to be addressed and threats that require mitigation in efforts to make the value chain work better for the benefit of the players, who are mainly women. We present the conclusion in terms of strength, weaknesses, opportunities and threats (SWOT) analysis in the sweet potato value chain in Table 19.

Table 19: SWOT analysis of sweet potato value chain

Strength	Weaknesses
<ul style="list-style-type: none"> • Sweet potato demands less inputs in production • Availability of land for sweet potato production • The government’s policy efforts to promote traditional crops of high value, sweet potato being one of the crops • A wide network of stakeholders working to promote sweet potato production and marketing • Good road network linking the production area to the major urban markets 	<ul style="list-style-type: none"> • Lack of affordable credit services, especially for producers • Weak bargaining power by individual producers due to weak collective action around marketing • Weak bargaining power by traders in the secondary markets due to cartel-like network of brokers • Lack of proper storage facilities • Inadequate supply of clean water for cleaning the commodity is a burden to women who do the work and poses health concerns
Opportunities	Threats
<ul style="list-style-type: none"> • Conducive agro-ecological climate for sweet potato production • Growing demand for sweet potato • The already existing commercial-oriented production and fairly established institutions along the chain, especially at production level • Sweet potatoes can be processed and used in different forms • Fairly well-established collective action institutions around sweet potato production 	<ul style="list-style-type: none"> • Increasing incidences of pests and diseases • Increasing incidences of erratic weather • Weak enforcement of the government’s policy on standard weight of packaging for agricultural produce

5.2 Recommendations

This study aimed to identify critical challenges that need to be addressed and assess growth opportunities that could be exploited to improve access to and participation by marginalized smallholders in agricultural markets, with a focus on women in the sweet potato value chain. The study has revealed that the sweet potato value chain in Kabondo Division in Rachuonyo district is indeed dominated by women at all nodes along the chain. A range of constraints

that need to be addressed and opportunities that could be exploited to make women participate and benefit more from the value chain have been identified. These constraints and opportunities pertain to the production as well as the marketing side of the value chain. Addressing the constraints and exploiting the opportunities will require concerted efforts by different stakeholders doing different things but towards a common goal of making the value chain work better for the actors, majority of who are women.

On the production side, ensuring adequate supply of clean planting material, appropriate agronomic practices, including control of pests and diseases, and access to capital for production are important in ensuring that women are able to engage in production, supply the market and derive benefits from participating in the market.

On the marketing side, much needs to be done. First, enhanced efforts in multiplication and distribution of clean planting materials are necessary. In addition to these efforts, there is need to train producers on good agronomic practices in sweet potato production, to enhance not only the productivity but also the quality of production that enter the market. There is also need to explore ways of transitioning to irrigation farming to mitigate the effects of increasing variability in weather conditions. The starting point for this would be to build the capacity of producers in rain water harvesting and appropriate utilization of available water resources.

Concerning capital for production, collective action among the producers is important source of credit. Strengthening the capacity of these collective action institutions to continue offering credit services to the producers may be desirable. However, the adequacy of these institutions to sustainably provide the services to the level that can make the producers expand their production more commercially may not be guaranteed. Therefore, sustainable ways of unlocking the credit constraints faced by the producers are needed.

Producers need more bargaining power to be able to negotiate for better terms regarding produce grading and pricing. The prevalent practice of producers selling their produce individually makes them prone to exploitation by traders through unfair practices. While efforts are being made by the KSPMCS to help farmers sell collectively and obtain better terms, there is need to also sensitize and strengthen the producer groups to embrace collective marketing. The groups are fairly active in other activities, including collective production of sweet potato and providing credit services, but are quite weak in collective marketing, yet it has been for long shown that collective marketing by smallholder farmers improve their bargaining power to negotiate for better terms in the market.

Secondly, packaging and selling sweet potatoes in standard units allowed by the law needs to be enforced. The Local Government Act (Cap. 265) published in the Legal Notice No. 113 of 2008 outlines the maximum threshold weight of agricultural produce for a range of commodities. The maximum threshold weight of a bag of sweet potatoes is directed to be 98 kg. However, the extended bags in which sweet potato is bought from producers and traded

along the value chain weighs up to 130 kg. The ultimate losers in this practice are producers, most of whom are women.

Thirdly, existence of cartels of brokers in the major markets in urban centers results in opportunistic behavior and inhibits competition. This concern needs to be addressed.

Finally, the sweet potato value chain is dominated by interaction of the actors in spot markets. In addition, value addition is only elementary (cleaning, sorting and grading). There is need to explore feasibility of establishing commercial processing of sweet potatoes. Processing of sweet potatoes has the potential of expanding high value market for the produce and address problems of glut and low producer prices in the market.

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Annex 1: Golden Kitare Women Group

History and activities of the group

The group was formed in 2003 by individual farmers and registered the same year with the Ministry of Social Services. The group was born out of the need to relieve members the burden of traveling long distances to participate in a religious group which served their interests. The group began with 20 women members and their main activity at conception was merry-go-round (rotating savings and credit association (ROSCA)). Through this activity, the group members acquired household items such as blankets, utensils as well as goats. In 2004, the group started to hire land for group farming. Each member contributed KES100 for this activity and they started to produce maize and sweet potatoes collectively.

In 2006, the group opened a bank account to deposit the accumulated sale proceeds from farming and saving activities. The bank has helped the group obtain loan to increase their scale of farm production and general group activities as well. In 2011, they acquired 32 plastic chairs which they hire out at a cost of KES 10 per chair per day. The group has also diversified its activities to saving and loaning to farmers, table banking, poultry production which they started at the beginning of 2012 and collective farming of other crops in addition to sweet potatoes.

In order to carry out the above activities, various stakeholders have offered services to the group. The group obtained a loan from the Women Enterprise Development Fund by the government. Agricultural extension officers have offered training on good agricultural practices as well as management of indigenous chicken. The Ministry of Cooperative Development and Marketing has also helped in marketing of sweet potatoes through facilitating formation and registration of the Kabondo Sweet Potato Cooperative Society. The Anglican Development Services has offered tremendous extension services on crop farming, marketing and financial literacy to the group, in addition to supporting the formation and operations of the cooperative society.

Membership

Membership in the group is voluntary and a nonrefundable fee of KES 200 is charged for joining. In addition, goodwill of KES 2000 is paid by any new member. A potential member must be vetted by all existing members, who also vote on whether to accept or reject his/her membership. The potential member is then taken through the group's constitution in the presence of all existing members. If the person agrees to abide by the constitution, he/she pays registration fee and goodwill and is admitted into the group.

Currently, the group membership has grown to 30 out of whom 23 are females and 7 males, and the average age of members lies between 27 and 70 years, with the majority aged 35-40 years. About 17 percent of the members have secondary education and the rest primary level of education. Besides group activities, group members individually take part in other

economic activities. For instance, two men trade in cattle, one of the female members has a clothes business, commonly known as “*mtumba*”, one is a primary school teacher and others trade in agricultural commodities. Most of the group members are considered poor, especially widows.

Governance structure

The group is managed by an executive committee comprising of chairman/lady, secretary and vice secretary, treasurer and organizing secretary. The executive committee members selected through majority vote by all members at an annual general meeting. In addition, the group has disciplinary, time keeping and finance committees whose membership is elected by the executive committee. All the leadership positions are held by women. There is no term limit for the executive committee members, and one can serve for as long as members of the group are satisfied by his/her performance and he/she is willing to continue serving. There are no restrictive conditions that define characteristics of candidates eligible for election except being a member of the group. This is because of the thorough vetting that takes place before a member is admitted to the group. Leadership is voluntary and no monetary rewards are given made to group officials.

Group meetings

The group has two main types of meetings, i.e the annual general meeting (AGM) and weekly meetings. Weekly meeting are for the purpose of conducting merry-go-round activities and discussing operations of the group. Table banking meeting are conducted after every two weeks. The AGM is held at the end of the financial year of the group. All members must attend the meeting and must be punctual. Failure to attend a meeting without apology attracts a fine of KES 100 while lateness is fined KES 20. If a member fails to attend three consecutive meetings, he/she may be deregistered, but a warning is issued before one is expelled from the group.

Decision making process

Decision making is a consultative process which involves interaction between members and the executive committee. Either of the parties (leaders or members) may give proposals but the final decision is made by members through voting at a meeting.

Conflict resolution

The group has a disciplinary committee, which also acts as conflict resolution committee, which arbitrates when there is disagreement that cannot be resolved through voting. The committee also reconciles members who may have conflicts related to group matters/activities. The committee members convene a meeting with parties involved in a conflict and discuss the issue of conflict, and if there is no solution the entire group is involved. If no solution is obtained, the wrongdoer in the conflict is identified and de-registered from the group.

The common conflict in this group is failure by a member to pay a fine. In order to instill commitment among members, the group uses the laid down procedures in the by-laws to enforce and punish the offenders.

Accountability

In order to ensure financial transparency and accountability from members and leaders, the group engages at a fee the services of an external auditor at the end of every year. In case the auditor detects any discrepancies in the accounts, he/she consults the officials. As at the time of this study the group had never experienced any problems with its financial accounts.

Revenue generation and financial services

The group generates much of its revenue from group farming activities, merry-go-round share, table banking, and interest on loaning. The maximum loan amount is usually three times of the member's savings and the interest rate is charged at 10% per month for three months. Other sources of financial services include Farmers Development Association of Kabondo (FADAK), Kabondo Sweet Potato Marketing Cooperative Society (KSPCS).

The group also has a welfare fund which is loaned interest-free to meet members' needs such as hospital bills and funeral expenses. Therefore, each member contributes KES 20 weekly for this welfare funds. From this fund, the group offers charity to very poor non-members in the community such as payment of school fees for orphans.

At the end of the year, profits generated from the activities are shared equally among members irrespective of the shareholding. This is aimed at improving welfare of relatively poor members. Part of the profit may be ploughed back for the purposes of strengthening group's financial base.

Production and marketing of sweet potatoes

Group members engage in sweet potato production collectively as a group and also individually on their individual farms. The group rents land for collective production of sweet potato. The members provide labour for production on the group farm. In addition, the group members practice labour sharing on their individual farms. The group also facilitates members' training on good agricultural practices in production of sweet potatoes.

The group sells its collectively produced sweet potatoes through the Kabondo Sweet Potato Cooperative Society in which it is a member. Selling through the cooperative society helps the group access better market information and better prices. At the end of the year, the group members also receive a bonus payment for the sweet potatoes sold through the cooperative. Because of being in the group, some of the members have realized the benefits of the cooperative society and have registered as individual members of the cooperative. They too sell their individually produced potatoes through the cooperative society and benefit from better prices and bonus just as the group does.

Group's challenges and opportunities

Despite the success of this group in remaining cohesive and engaging in diverse activities, including production and marketing of sweet potatoes, they face some challenges in sweet potato production and marketing, which if solved, they would perform well. Some of the challenges and potential areas of investment to overcome the challenges are enumerated below:

- Reliance on rain-fed production of sweet potatoes in the face of increasingly unpredictable weather poses a challenge. Increasing incidences of drought and erratic weather patterns have resulted in losses in sweet potato production. This can be overcome through investing in water harvesting and irrigation. Training of farmers on rainwater harvesting and use of the water during periods of drought was identified as one of the steps that could help in advancing towards irrigation
- The group also cited the need for increased training on agronomic management of sweet potatoes, including use and management of certified planting materials and timing of farm operations
- Poor feeder roads is a hindrance to timely transportation of sweet potatoes to the market, and results into high transport costs and losses.
- High cost of animal traction was cited as a barrier, especially among women most of whom do not own cattle and ploughs. Ploughing services are relied upon during land preparation and harvesting of sweet potatoes. Empowering the groups to obtain their animal traction services, which they can also hire out would be beneficial
- Inadequate access to credit is blamed on scarcity of credit facilities in the area and those that are available have stringent conditions and are expensive, which majority of group members are unable to meet. Some of the requirements in applying for credit include making available things like title deed and fixed assets as security, which many farmers especially women do not have
- Lack of information, especially among low educated women, hinders them from applying for credit since they do not understand terms of loan. Long application procedures also discourage them from applying for loans. Therefore, one of the needs identified was training on financial literacy and management. This would help farmers to apply loans and use knowledgably

Annex 2: Kabula Women Group

History and activities of the group

The Kabula Women Group (KWG) was formed in 2006 by individual farmers who saw the need to work together in subduing challenges they faced as a community. Their goals were to

reduce poverty and enhance business activities among the group members. This was to be achieved through improving their farming skills (through group training), educating more children and offering welfare support to the less fortunate members of the community such as orphans and widows. At conception, the group had 15 members comprising of 14 women and one man. The group's initial activities in 2006 were merry-go-round, crop production (sweet potato, maize, ground nuts, sorghum and millet) and poultry keeping. The group was registered the same year (July 2006). In 2008, the group started a table banking activity whose success attracted more members. In 2009 the group purchased plastic chairs for hiring out. In 2011 it started an agro-forestry activity which also involved production of tissue culture bananas. Unlike other activities, this activity was stifled by inadequate seedlings/ planting materials.

Membership

Requirements for membership include a non-refundable registration fee of KES 800, voluntary interest to take part in group activities and having a good reputation in the community. A potential member places his/her request to join the group, is vetted and approved by members and presented to the group's constitution to which he/she must promise to abide by before he/she can be admitted into the group. The potential member thereafter pays the registration fee and is admitted to the group. The constitution of the group also provides procedures of withdrawal from the group and a member cannot claim more than is owed to him/her by the group in case of withdrawal.

The group currently has 28 members, consisting of 24 women and 4 men. Majority of the members are aged 30-45 years. About 14 percent of the members have secondary education while the rest have primary school level of education.

Alongside group activities, members of this group individually engage in various economic activities such as farming, hawking, welding, vehicle repair and formal employment. This demonstrates their differences in resource endowment. The group affirmed that majority of the members are poor.

Governance structure

The group is managed by an executive committee comprising of chairperson, vice-chairperson, treasurer, vice-treasurer and secretary. Members to the executive committee are elected annually by all members at annual general meeting. However, if members are satisfied with performance of an executive committee member, elections for that position may not necessarily be held. There is no limit to the period an executive committee member can serve. Other committees in the group include conflict resolution and time keeping whose members are also elected by the group members. Leadership is voluntary and no wages are paid to elected leaders of the group. The group's constitution empowers the committees to enforce the rules and regulations which govern the activities of the group. Currently, women occupy four out of the five positions in the executive committee.

Group meetings

The group has two main meetings; annual general meeting and regular fortnight meetings for the purpose of merry-go-round and table banking activities. All members must attend the meetings failure of which a penalty of KES 20 is charged. Group members also meet for labour sharing activities on individual members' farms and on group farm. If a member cannot participate on labour sharing for one reason or another, he/she must either send a representative or pay a penalty of KES 200.

Decision making process

Decision making is a consultative process which involves interaction between members and the executive committee. Either of the parties (leaders or members) may give proposals but the final decision is made by members through voting.

Conflict resolution

Conflicts in the group are resolved by the group's conflict resolution committee. When need for arbitration arises, the committee may call the conflicting parties for arbitration. In case the matter is not resolved, the committee involves all the group members who, if necessary, vote over the issue. However, if the conflict involves an urgent issue, the resolution is directly sought from the group members and necessary sanctions are taken.

In order to minimize conflicts in the group, members are encouraged to listen to one another's ideas/opinions. The group also encourages members to peruse through the financial records as a way of promoting accountability and transparency in the leadership and management of group's resources.

Revenue generation and financial and other services

The different sources of revenue for the KWG include farming activities, which is the key, membership fee, interest on loans, member contributions, hiring out of chairs and fines. The group also obtains financial assistance from the Anglican Development Services.

The group offers financial support to its members in form of loans and grants. Loans are advanced to members at an interest rate of 10 per cent per month for three months. Through the table banking activity, the group members are also encouraged to save money. Table banking was identified as the most successful activity which attracted new members into the group. Merry-go-round activity also adds to the financial strength of the group members.

Other than fiscal services, the group helps its members obtain extension services on good farming practices and technologies. It also facilitates the group members obtain markets and market information for their sweet potatoes and share farm labour during planting and harvesting of sweet potatoes. These services are important to the production and marketing of

sweet potatoes for the group members, and they are perceive positive contribution of group membership into profitability of sweet potato enterprise.

At the end of every calendar year, the group members share profits from the group's activities according to the shares of each member.

Production and marketing of sweet potatoes

The KWG members engage in sweet potato production collectively as a group and also individually on their individual farms. The group rents land for collective production of sweet potato. The members provide labour for production on the group farm and also share labour on their individual farms.

The group sells its collectively produced sweet potatoes through the Kabondo Sweet Potato Cooperative Society in which it is a member. The members, however, sell their individually produced sweet potatoes individually through various marketing outlets.

Group's challenges and opportunities

The group is aware of the multiple benefits that sweet potato holds for member as a cash and food crop. As population increases, demand for sweet potato will continue to soar. Therefore, the group believes that members are likely to tap this benefit if they are able to expand commercial production of sweet potatoes. Therefore, despite the success of the group, the members cited the following as some of the challenges that need to be addressed and the opportunities that can be explored in order to take advantage of the promising market demand for sweet potatoes.

- Reliance on rain-fed sweet potato production has made the production very vulnerable to unpredictable weather patterns. Highly fluctuating production as a result of drought have resulted in inconsistency in participating in the market for sweet potatoes. Availability of clean water is also very important for cleaning sweet potatoes after harvest. These challenges can be overcome through embracing irrigation. Training of farmers on rain water harvesting and management of water resources would be important in efforts towards engaging in sweet potato production through irrigation.
- Increasing incidences of pests (especially weevils) and diseases (especially sweet potato virus) are also a problem in production. Farmers need training on agronomic management of sweet potato, including selection and managing planting materials.
- Shortage of planting materials has hindered adoption of improve sweet potato varieties, especially the orange fleshed variety. Promoting farmer groups to bulk planting materials could be beneficial.
- High transport cost is a major constraint to sweet potato marketing. This can be attributed to poor feeder roads in the area.

- High cost of credit is a problem to sweet potato production. The KWG has a high number of windows who lack collateral such as land title deeds required by many financial institutions for accessing loans. Some financial institutions also have stringent requirements which deter many women from accessing credit. In addition, failure to disclose full information on terms of credit is also a reason why many women shy away from seeking loans from micro-finance institutions. In response to the constraint, the group proposes creation of target credit programs in the region that would offer agricultural loans (both cash and kind) at affordable interest rates. Also, training on financial management would enable farmers to be more wise managers of finances in their productive activities.

Annex 3: Kabondo Sweet Potatoes Marketing Cooperative Society

History of the cooperative

The Kabondo Sweet Potatoes Marketing Cooperative Society (KSPCS) Ltd. was initially formed as a women group (Obuya Women Group) in the year 2007. The group was later transformed into a cooperative through liaison with the Anglican Development Services and was renamed Kabondo Women Sweet Potatoes Cooperative Society. Its membership was about 400 women and women groups at the time of the formation. However, the name was not welcome by men since they felt left out yet they also participated in potato production and marketing in the region. Therefore, in the year 2011 the cooperative was renamed Kabondo Sweet Potatoes Marketing Cooperative Society. The change of name saw increased membership by men and a few women, and in 2012 there were 800 registered individual members and groups. The groups were 308. The cooperative was officially launched in 2011 by the Minister for Cooperative Development and Marketing.

The main objectives of the cooperative are:

- To improve the bargaining power of producer members in marketing their sweet potatoes
- To inculcate saving culture among the members
- To train farmers in production of sweet potatoes

Membership

Membership in the cooperative society is through producer groups and individually. For one to register as an individual member of the cooperative, he/she must be a member of a producer group that is a member of the cooperative. An individual member and a producer group are treated separately as individual members by the cooperative. Membership is through shareholding, valued at KES 100 each. The maximum number of shares a member can hold in the cooperative is KES 3000. Dividend earnings are based on the number of shares held by a member.

Governance structure

The management of the cooperative is through a management committee, comprising of a chairperson, vice-chair person, honorable secretary, treasurer and seven members. The management committee is comprised of five women and six men. In addition, there is a supervisory committee comprised of three members whose role is to ensure that the management committee runs the cooperative's affairs appropriately. Members of the management committee and the supervisory committee are elected into office after every three years by the cooperative members during annual general meeting. The representation in the committees is determined by the administrative locations from which the cooperative members hail.

The management committee holds its meetings every Thursday to review the operations of the cooperative. In the agenda of these meetings are usually:

- Sweet potato production quantities reported by sweet collection center representatives (CCRs)
- Quantities of sweet potatoes delivered by members
- Provision/review of credit requests by members
- Capacity building activities to members, which entails training farmers on production and farming as a business.

Activities and services

The cooperatives activities and services to members revolve around sweet potato production and marketing. Majorly, it helps members creates market linkages, buys sweet potatoes from members to sell, and provides members access sweet potato market price information through M-farm mobile market services.

To facilitate marketing of sweet potatoes by members, the cooperative has collection centers (CC) for the produce with each CC managed by a collection centre representative (CCR). The CCRs manage and keep records of volumes of produce delivered by members, volumes sold and price information. They also keep data on acreage of sweet potatoes planted by members, planting dates and expected harvesting dates. The cooperative buys the produce from members at a negotiated price and sells to major markets in urban centers, mainly Nairobi. It is through the price difference between purchase from members and sales that the cooperative makes profit, which is used to run its activities and pay dividends to farmers.

In addition to facilitating members sell their sweet potatoes, the cooperative also provides credit services to members for production of sweet potatoes. The credit is offered at 3 percent interest rate and is payable after harvesting sweet potatoes (usually this credit is payable within a period of six months).

Challenges and opportunities

In spite of the success factors enumerated above, the cooperative sees the following as major challenges:

- Diseases and pest infestation of the sweet potatoes is becoming a concern to production of quality sweet potatoes. Low quality tubers are hard to market and are of low value
- Opportunistic behavior by some value chain players is a concern in marketing. For instance, cartel-like network of brokers especially in major urban markets make penetration to the buyers in those markets impossible. The brokers exploit the cooperative and other suppliers to the markets
- Buyers sometimes opt to buy sweet potatoes from non-cooperative members, usually at lower prices, in the production area
- Lack of storage facilities for sweet potatoes in the production area, forcing immediate sale of the produce hence low prices due to oversupply
- Lack of processing of the commodity, which would have created more market

Some of the opportunities that could be explored include:

- The market demand for sweet potatoes from Kabondo Division is high and growing
- The climate for Kabondo Division is favorable for sweet potato production. Farmers could exploit this to maximize production. Increasing production can be achieved through introduction and use of high yielding sweet potato varieties and training farmers on good agronomic practice