

STUDY REPORT ON LOCAL SEED TRADING IN WESTERN KENYA¹

DRAFT REPORT

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Acknowledgement

This study was motivated by our desire to contribute towards understanding the status of local seed traders in western Kenya; their current practices and constraints. The expected outputs of this two-phase study were reports and project proposal for further intervention aimed at improving the access of the resource-poor farmers to local and improved varieties of seed. Apart from a 2-day stakeholder workshop to provide feedback on the study findings and agree on ideas of the project proposal (during the second phase of the study), we planned to use the findings in CTA's programme areas dealing with Market Information Systems, Rural Radio and Agricultural Trade Policy. We also planned to disseminate the main findings of the study to a wider audience through CTA's bi-monthly bulletin (*Spore/Espro*) and via its web portals. On behalf of the research team at Centre for African Bio-Entrepreneurship (CABE) and our local partner, Appropriate Rural Development Agricultural Programme (ARDAP) in Kenya, I acknowledge the intellectual guidance and financial support of CTA. I also acknowledge the contribution of all the respondents and field staff in western Kenya.

Abbreviations and acronyms

ARADP:	Appropriate Rural Development Agriculture Programmes
CABE:	Centre for African Bio-Entrepreneurship
CTA:	The Technical Centre for Agricultural and Rural Cooperation
KARI:	Kenya Agricultural Research Institute
KEPHIS:	Kenya Plant Health Inspectorate Services
LCS:	Local seed traders
LST:	Local seed customers
<i>Agrovets:</i>	Local stockists or merchants selling farm inputs
<i>Boda boda</i>	Bicycle transport for humans and goods
<i>Gorogoro:</i>	A 2-kg metal tin used a measuring can
<i>Jua Kali:</i>	Open-air trading or small businesses
<i>Malambisa:</i>	Village-level businesses where the wares are laid on ground
<i>Merry-go-round:</i>	Informal credit system --accessed by group members in turns
<i>Nagugu:</i>	Local variety of sorghum --common in western Kenya
<i>Seredo</i>	Certified variety of sorghum

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1: INTRODUCTION

The report discusses important but largely unrecognized informal seed systems in Kenya and emerging possibility of more understanding of this sector. It provides an overview of our recent exploratory study on local seed traders (LSTs hereafter) and farmers or local seed customers (LSCs hereafter) in western Kenya where we made an initial attempt to understand this informal sector. During the study we found out that LSTs are traders who produce and/or buy local grains specifically for sale at the marketplaces and/or from their homesteads to be used as seed or food while LSCs buy local seeds/grains from LSTs for planting on their farms or to be used as food.

The study funded by the Technical Centre for Agricultural and Rural Cooperation (CTA) was undertaken by our newly established Centre, Centre of African Bio-Entrepreneurship (CABE) in collaboration with our local partner, Appropriate Rural Development Agriculture Programmes (ARDAP) during October and November 2004 in six divisions of Busia, Bungoma and Siaya districts. The report represents the first phase of the study in which we employed market surveys involving LSTs, key informant interviews and focused group discussions with LSCs. The final phase will focus on filling the data gaps identified in the first phase of the study (see sections 6.2). This will be done through literature review of the contemporary seed policy and programs, key informant interviews and an administration of a questionnaire which was tested during the first phase. We will then synthesize the findings of the two phases and prepare a report which will be discussed during a 2-day stakeholder workshop. The workshop consisting relevant local seed entrepreneurs and customers, policy makers and development partners will agree on the proposed project ideas for social, legal and material support to the informal seed systems in the study area.

The novelty of this study concerns three interrelated areas in which LSTs and LSCs can play an important role in reversing the declining production and farm incomes in Kenya's smallholder agriculture. First, is the concern of facilitating access to seeds to the smallholder farmers who due to poverty have difficulty in saving their own seeds and thus requiring off-farm seeds and other agricultural inputs. Second, due to the declining government agricultural services, LSTs and LSCs can become effective local partners in the introduction of appropriate agricultural technologies and related services. Third, LSTs can provide the much needed market opportunities for the farm produce and household items for the scale farmers. Therefore, this report presents the findings of a brief study on practices and relationships in the informal seed systems and draws out some tentative implications for future research and action.

Although the study should be seen as a preliminary one in the sense that it was relatively brief and limited in coverage to make definite conclusions, the findings suggest that local seed trading is evolving as a new approach in linking informal and formal seed systems in Kenya's smallholder agriculture. In this approach, informal seed production, processing and marketing are sometimes done holistically by LSTs, but often require a close relationship with diverse set of farmers or local seed customers (LSCs). The preliminary findings suggest that the impact of informal seed systems in the small scale farming is significant in the area under review.

While this statement is true, it would appear that informal seed systems face many challenges which hold back LSTs and LSCs from socio-economic development. First

and foremost amongst these lessons is that while there is growing acknowledgement that the informal seed systems account for over 70 per cent of the seed sources in Kenya, this sector is not recognised by the relevant national policy and legislation. Second, there is great challenge from the blurring of the distinction that exists between grains and seeds because farmers or LSCs get confused as to whether the grains being sold by LSTs in the local marketplaces are specifically for seed or food. Third, while LSTs form an integral part of agricultural production and an important link between producers of the preferred local seed varieties and farmers, there is a need to devise ways in which these relationships can be linked to formal organizations and institutions –for growth. The study has much to offer with regard to the starting point of this socio-economic study. A general implication for CABI and its development partners is that much more time and effort need to be invested in institutional learning of the informal seed systems --if we want to enhance its recognition and performance.

The report begins in Section 1 by giving an overview of the study sites and the methods used in the data collection and analysis. This Section also deals with general information on respondents in terms of the profile of key informants and market interviewees. A brief overview of LSTs' background and characteristics, reasons for getting into local seed trading, and seed sources and outlets as well as costs of operation are covered in Section 3. The discussion also highlights the market constraints and suggestions by LSTs to overcome some of the constraints. In particular, LSTs suggested the need for capacity building to improve their existing knowledge on local seeds and to cooperate with each other in order to reduce their costs of operation as well as lobby relevant authorities for recognition and improved service delivery. It is perhaps in this regard that CABI's experience has greatest relevance to on-going debates about linking smallholders to appropriate market and non-market agencies.

Section 4 describes the characteristics of small scale farmers or what we refer to in the report as local seed customers (LSCs). It explores how faced with poverty especially inability to save own seeds, the resource poor farmers are resorting to buying seeds from local seed traders. This led LSCs to suggest the need to be trained on local seed selection and improved seed saving techniques and quality management. They also suggested that efforts should be made to set up local market information centres to gather and disseminate relevant and timely information. Section 5 discusses market information and patterns of relationships between LSTs on the one hand and between LSTs and LSCs on the other. It also explains that patterns of relationships among LSTs and LSCs are characterized by co-operation and opportunism. This information will be used to further explore the associated institutional changes that are taking place and confirm to the notion of local learning and adaptation for LSTs and LSCs. The final section summarises the report and make suggestions on areas of further exploratory research and action in terms of action-oriented projects with research support.

2: BACKGROUD TO STUDY

2.1 Objectives of the study

The objectives of the pilot survey were:

1. To identify local seed traders and review their existing practices and constraints in local seed production, seed acquisition and marketing.
2. To use the findings from the pilot survey to recommend areas to be further explored and suggest ways to improve the pre-tested questionnaire.
3. To identify indicators of information flow and major players in the local seed trade and explore areas that require project intervention.

2.2 Study sites

The pilot survey was conducted in six divisions within three districts: Siaya in Nyanza province, Bungoma and Busia in Western province of Kenya. The divisions were Butula, Budalangi, Matayos, Funyula in Busia district; Ukwala in Siaya district and Bokoli in Bungoma district. Funyula and Budalangi divisions were selected to capture cross-border (Kenya-Uganda) movement of local seeds (**see Map of Kenya in Appendix 1**).

There was lack of secondary data on seed trading at the divisional and district level. According to the Divisional agricultural officers of Funyula and Matayos, their departments have never at any time focused on local seed trading. This study was the first attempt to look into aspects of local seed trading in the six divisions. “What we do is to recommend to farmers the use of clean seeds” said the Divisional Agricultural officers.

Bungoma district is a high potential area and along with Trans-Nzoia district form the main sources of maize in Kenya. Farmers in the district use hybrid maize (6 series) that they buy from the agro-vet shops at the market places. Therefore, it is not surprising to find LSTs in Bokoli market selling only seeds of indigenous vegetables, beans and groundnuts. Due to culinary preferences, sorghum and millet seeds are common in the market places. The seeds are obtained from producers around the market and also outside the district from Kisumu and Malaba.

Busia district has both low and medium potential agricultural areas. Funyula and Budalangi are low potential areas while Matayos and Butula are medium potential areas. The Ministry of Planning ranks the district fifth in poverty according to 2003 statistics. LSTs in Funyula and Budalangi do not produce seeds for sale because of persistent drought, poor agricultural practices (lack of fertilization, poor control of pest and diseases and sowing techniques, etc) affect the yields of local maize, sorghum, beans and groundnuts. Low yields means that the grains are inadequate to feed the family let alone saving for seed and sale. Budalang'i division is an area characterized by frequent floods. Thus, flooding constantly interrupts production and saving of seeds. The area also receives maize and beans as relief food –some of which many farmers use as seed. In Butula and Matayos divisions, some LSTs produce

seeds but the seeds are not adequate for sale throughout the period between harvesting and planting. LSTs in Busia buy their seeds from across the Kenya/Uganda border where prices of seed/grain are cheap and the supply is constant. Some of the seeds bought are local maize seed (yellow variety), sorghum, various bean varieties and groundnuts.

Siaya district is a middle potential area and borders Busia district. Most LSTs in Ukwala division produce seeds for sale. They also buy seeds from other producers within the district. In the district, large-scale farmers and some small-scale farmers use hybrid maize. However, there are some small-scale farmers who use local maize varieties. Other seeds of beans, sorghum, cowpea, millet and indigenous vegetables are bought from LSTs.

2.3 Methods of data collection

Data was collected through focus group discussions of farmers comprising of 10-25 group members. In each division, one group was selected for the focus group discussions. The groups consisted of both male and females although women were represented by 75%. Direct interviews were conducted with 6 LSTs per division (36 in all) and on 4 key informants per division (24 in all). The key informants comprised of two males and two females whose ages was drawn from youths (18-25), middle age (26-40), and elderly (50 years and above).

The interviews with LSTs were conducted at various marketplaces. These markets were selected on the basis of their central location within a given division. The markets were Murumba market in Butula division, Funyula market in Funyula division, Nyadorera market in Budalangi division, Ugunja market in Ukwala division, Bokoli market in Webuye division and Matayos market in Matayos division. The six traders interviewed were randomly selected within each of the market places. Few males were included in the survey because females dominate the trade and in some markets there were no male LSTs at all.

2.4 General information on respondents

Key informants: There were 14 males and 10 females interviewed who provided the ethno-biographies. Their ages ranged from 25-80 years. Two of those interviewed were illiterate, eleven went up to primary level, and five completed secondary level while one obtained tertiary education. Twenty-one of them were married while two were single. Seventeen key informants were mainly farmers, the rest were farmers who also engaged in other off-farm activities like teaching and other businesses.

Market interviews: A total of two males and thirty-four females dealing with local seed trading were interviewed. Their ages ranged 21-86 years but a majority of them were of the ages of 40-60. Twenty traders were primary school dropouts, ten were illiterate, three (3) were semi-illiterate while three (3) of them had informal education. One seed trader was a wholesaler of local seed, while eleven combined both local trading and farming. Twenty-six (26) of the traders had experience in local seed trading of 10-30 years. Among those who were interviewed, eighteen (18) were

married, seven (7) were widowed and the rest were single. All the respondents said they solely owned their businesses.

All the marketplaces under review had agro-vets (local stockists or merchants) because some farmers preferred certified seeds. Seeds of tomatoes, kale, cabbage and onions are commonly bought from Agro-vets because one cannot find such seeds with the LSTs. LSTs in the marketplaces were seated in a single profile one next to another. In all the marketplaces, LSTs constituted less than (10%) of all traders. Other trading in the market included agricultural produce (20%), animal and poultry (10%), clothing and textile (50%) etc. The most populated market was Ugunja and had the highest number of LSTs who were located within and outside the market parameter. The least populated was Bokoli market. Bokoli and Murumba markets, start operating in the afternoon while the rest open as early as 8.00 Am.

3: LOCAL SEED TRADERS

3.1 Background and characteristics of local seed traders

Local seed traders (LSTs) deal with different types of seeds and varieties of a given seed crop. The type of seeds for cereals that were sold include; sorghum, finger millet and local maize (yellow and white varieties). Common beans, soyabeans, cowpeas and groundnuts are some of the legumes on sale. Indigenous vegetable seeds found at the marketplaces include; spider plant, black nightshade, *Amaranthus sp.* *Crotalaria sp.* and jute plant.

Most of the traders interviewed said they have over ten years of experience which is advantageous to them since they have been in the business for long and have established networks with LSCs as explained by Pascalia Opiyo of Ugunja market “most people prefer buying from me because of my age.” Many said that their long stay at a given market place has made farmers to have faith in them regarding the seed quality.

Regarding the start-up business of selling local seeds at the market, there were different ways as to how they started their seed trading. Some of the LSTs said they were taught the business by their mothers when they were still young like Rose Atieno of Nyadorera market who said she started helping her mother at the market when she was 10 years old. She only began operating on her own when she got married. Her mother continues with the business at the same marketplace.

Several LSTs set-up businesses on their own initiative. Some started by selling other consumer goods like paraffin, charcoal, tomatoes, kale and cassava before venturing into local seed trading. Although some still continue to sell these goods, most of them are concentrating on seeds. A 21-year old Policap said he was tired of hawking charcoal so he decided to settle at the market place by trying to sell seeds. One trader said she sold her chicken to get capital for local seed trading. Some started by selling one or two types of local seed varieties in small quantities before expanding to a

variety of seeds. Rashid Otongolo of Funyula market started with a debe (or 20 kg) of maize in 1968 and now he is a wholesaler having six types of seeds.

There are some traders who started by producing their own seeds and selling them at the market. Pamela Auma of Ugunja market said, "I sell cowpea and common beans which I produce on my farm". She got the seeds for planting from the marketplace. Many LSTs said that they still have to buy seed varieties they do not produce on their farms from other farmers or from the marketplace.

There is one trader who said she started her business with the assistance of another trader as a way of improving her livelihood and stop depending on her husband. She got motivated by the high returns from local seed trading. Most of them started their business at the local market near their villages.

The characteristics of local seed traders (LSTs) include:

- *LSTs are local*: a majority of the seed traders interviewed come from villages surrounding at least one of the marketplaces they operate from. Some of the farmers or LSCs call the traders by name or by the village they come from. LSTs and LSCs at the local marketplaces talk freely to each other and use the local language/names when communicating about various seed varieties.
- *Most of the retail LSTs held small stocks of varied local seed types and varieties*. This they said was due to lack of resources to buy huge stocks. For example, in the case of indigenous vegetables a trader can have a stock of 2-4 kg contained in a basket or a polythene bag while for local maize, sorghum and beans, the majority of LSTs hold 2-3 bags of 100 kg each at any given time.
- *LSTs are mobile*: A majority of the LSTs interviewed stated they move from one marketplace to another and operate in 2-3 markets. This habit is attributed to the fact that each market place has a specific market day in a week which makes the other days of the week inactive. A market day is a day set to bring together traders of all kinds and attracts customers from different areas. Therefore, LSTs try to optimise sales by selling at other local markets during the respective market days. Some traders stated that at some marketplaces, they obtain seeds cheaply from farmers. While some LSTs prefer markets that are near to their villages. A trader who operated from one market cited domestic problems as her main reason for not selling in other markets.
- *LSTs operate in the open-air market locally known as 'jua-kali'*: LSTs display their seeds in sacks/bags folded at the brims or woven basket trays placed or spread on manila bags on the ground. The LSTs sit besides their wares with nothing to protect them from the erratic weather. When it is hot the LSTs use umbrellas to provide shade, when it rains, they pack the seeds and seek shelter until the rains stop --and depending on the time, they resume their business or go home. The LSTs that we interviewed did not see this as a problem because it has become a normal practice for them. But they agreed that a sheltered structure is better for selling their goods.

- *LSTs sell seeds in small quantities*: local seeds are easily affordable because they avail them in very small units. As shown in Table 1, local seeds especially those of indigenous seeds; millet and sorghum are measured/weighed in unconventional methods that one cannot easily quantify. LSTs measured seeds using plastic bottle tops of varied sizes, teaspoons and glasses. The largest unit is measured using a 2-kg tin locally known as *gorogoro*. The smallest unit was a teaspoon of measuring indigenous vegetable seeds that costs Ksh3.00. In the case of sorghum, most small farmers buy the 250 g tin for Ksh. 10.00 (see Table 1).

Table 1: Local seed prices of selected categories

SEED TYPE	QUANTITY	PRICE (Ksh.)
Beans	250gms, 1Kg and 2 Kg	10-180
Cowpeas	25gm tin-2Kg	5-150
Local maize (yellow and white variety)	250gm-2Kg	10-50
Sorghum	500gm-2 Kg	10-40
Green grams	250gm-2Kg	10-120
Ground nuts	250gm-2Kg	15-160
Simsim	250gm-1Kg	10-150
Finger millet	500gm-2Kg	12-90
Jute plant	Tea spoon-250gm tin	3-30
Crotalaria	250gm-2Kg	25-200
Black nightshade	Tea spoon-250gm	5-30
Spider plant	Tea spoon-250 gm	5-30

Source: Fieldwork

- *A gender biased trade*: Of the 36 traders we interviewed in 6 marketplaces, 34 were female. Only two markets had a male trader in each place. According to the LSTs, it is a trade looked down upon by most men in the area. One male respondent summarized the biased attitudes of fellow men as follows: “Women are like children, their work is to be sent, so we send them to the market to sell seed”. Another male said “a man couldn’t sit in the market selling small things like seeds”. Similar sentiments were expressed by farmers or LSCs. In particular, men in the farmer focus group discussions said that “women know the best seeds to buy”. However some men said they supported their wives financially in seed trading.
- *All LSTs interviewed were unregistered*: Since they term their trade as *jua-kali* (or informal), they saw no need for registration. Kenya Plant Health Inspectorate Services (KEPHIS) as a body that registers seed traders has never questioned their

business and only concentrates on certified or formal seed traders. All LSTs said that they have been operating without registration for as long as they can remember.

3,2 Reasons given for getting into local seed trading

There were three major reasons that were given by the traders as to why they got into selling local seeds:

- i) For self-employment instead of sitting at home, LSTs decided to get into the trade to earn a living. One trader said 'to get a job nowadays you need education which I don't have but this is not the case for this business'. The trade has made them not to depend on others especially their spouses;
- ii) Some LSTs are sole bread winners in their households especially the widows --and depend on the income generated from the trade to meet family needs. "Food and school fees are obtained from this business" explains Florence Anyango;
- iii) Other LSTs got into the trade to diversify their sources of income. These traders besides selling local seeds, sell other commodities. Leonida said that initially she was selling tea leaves, curry powder and, magadi soda (or soda ash). However, her customers were also asking for seeds and "that's how I decided to sell seeds alongside my other goods";

LSTs who inherited the trade from their mothers say it is the only business they have known since they were young. They have never thought of trying any other trade.

3.3 Seed sources and outlets

There are several sources where LSTs obtain seeds for sale. Some of those interviewed said they produce seeds on their own farms and sell at the market. Leonida Atiando of Matayos market said she produces seeds of *crotalaria sp.*, *Amaranthus sp.* and jute plant. She harvests up to 15 kg of seed of each plant species in a given season. Although she does not remember where she obtained her initial seeds she has had the seeds since she was a little girl. Some of those LSTs who produce seeds for sale obtained seeds for planting from their stock of seeds. After harvesting, the surplus is sold at the local market. This is common for dry beans, local maize, sorghum, and millet. LSTs said they only buy seeds they don't produce on their farms, whose quantities they said were small. Meanwhile some LSTs lacked the money to lease land for seed production. LSTs and farmers also exchange some of the seeds they produced with other seed varieties to meet particular market demand. This is done on their farms.

Some LSTs said they buy seeds from farmers at the local markets and sometimes farmers bring seeds to their homes. Farmers bring seeds to the market in small quantities such as 2-5 kg of beans and sell at "throwaway prices" but the LSTs said they check the quality first before buying. At the marketplaces, LSTs pay in cash while farmers who sell to them seeds at their homes can do so on credit or accept other material things like chicken. LSTs say they take advantage of the low prices

during crop harvesting to stock up and store in readiness to sell during the dry period or planting season.

Based on the interviews, most LSTs buy seeds from the bigger markets located in the nearest towns “I am able to get a wide range of seed that I cannot get locally when I buy from Busia” explains Jane Nafula of Nyadorera market. These markets sell local seeds in bulk and at low prices. The markets can be 20-30 km away from local villages.

Some LSTs who said they bought their stock of seeds from the Uganda/Kenya border. They buy from the border when there is drought in Kenya and prices of local seeds are high due to scarcity. Several seeds especially of local maize, groundnuts, some bean varieties and sorghum are bought from Uganda at low prices. Also some “middlemen” bring seeds to the local market using bicycles.

On market outlets, LSTs’ customers come from neighboring villages, some even as far as 10 km away. Unless the customers specify their preferences, some LSTs were unable to categorically say that the seed they were selling was meant for planting or for food. This situation occurs in the case of maize, beans, sorghum, millet and groundnuts where seeds can serve both functions. However, the traders stated that the demand for seed is high during the planting season and the quantities bought are smaller than that for food. Thus, LSTs’ stock of seeds serves two purposes. Paulicarp of Murumba market says ‘when a customer asks for maize for milling I sell to him from the same sack as those who ask for maize seed’. However, most farmers said they know the seeds for planting because such seeds are mixed with ash even without asking the LSTs. But this is hardly the case in the six marketplaces.

Another market outlet for the LSTs entail a small seed traders who buys from them in small quantities and specialize in one or two types of seed to sell at the village marketplaces. These market activities known as *Malambisa* are active in the evenings. Florence Anyango says she sells to other traders who in turn sell directly to village farmers who are unable to go to the local market. Some LSTs said that farmers come to their homes to buy seeds. The farmers pay cash or are given seed on credit. Some LSTs also said they carry out seed exchange with the LSCs especially with respect to varieties of seeds they did not have (See Box 1).

Box1: Narrative of a typical local seed trader

Florence Anyango is a local seed trader from Ugolwe, Rang'ala sub-location in Siaya district. She started her local seed trade in 1986 by selling cowpea, groundnuts and local beans. She sells at Sidindi and Ugunja markets though she says she prefers Sidindi market because she buys seeds there are sold at a better price than the latter. Like other traders in the market, Florence has not registered her business with the authorities and only pays Ksh 20/ for the use of a space in the marketplace.

Florence is also a seed producer. She stated that she produces yellow maize, cowpea and red beans. The yields from her farm are not sufficient for her customers so she buys additional seeds from other farmers at the local market and from farmers in her village. Her initial source of local maize and bean seeds for planting was obtained from her mother and she has been selecting and saving the seeds ever since. She says she shares some of the saved seeds with her neighbors and relatives. She buys other seed varieties from the market or gets from her neighbors. Florence prefers local seeds because they require little manure and rain to germinate.

Her daughter assists her with the business. She also has a small shop but says the seed business performance is much better. At the market, she discusses with other traders on the prices to set on particular seeds though she says "fixed prices affect us when we buy our stock at higher prices and benefits those who buy at lower prices." She used to store seeds at the market when her stock was large but now she stores at her home because the stock has reduced which she attributes to increased financial responsibilities at home. She also says the profit from the business is too small to expand her business.

Some of her customers buy seeds from her to sell to other people at the village while others buy for planting. She says she ensures strict selection of seeds and preservation using ash so that her seeds are always of good quality. In a day she can sell up to 60 kg of beans and 2 kg of cowpea. She stated that she never sells on credit.

Florence says she has only been approached by an NGO called Ugunja Community Resource Center to discuss on issues related to seed systems but not specifically seed trade. Like many other local seed traders in the area, Florence would like more support from other institutions to improve their trade. In particular, the provision of micro-credit to scale up their businesses and capacity building on improved ways of seed selection practices and preservation. She would like to have information on where to buy seeds that is of high quality and low price like other traders in the market because such information is closely guarded by competitors to get high profits.

Florence concluded that it would be a good idea if she could meet with other seed traders from other areas to share experiences.

3.4 Costs of operation

The survey established that most LSTs do not maintain records and therefore they were unable to provide their monthly expenses. The estimates they gave were for a single day and they replace their stock as it gets finished and do not keep records of how many kg or bags they have sold in a week or month.

Transport: LSTs spend money on vehicles to transport their stock from the buying centers i.e. bigger markets like Busia to their local market. Hellen of Nyadorera market said she spends Ksh 300 on transport from Busia to Nyadorera market, others spend up to Ksh.400 depending on the distance. Another transport cost they cited was the transport from the point of storage to the market place. Some spend up to Ksh 300 while those who store near the market spend Ksh 60-100. LSTs with many goods are charged Ksh 30-60 by a *boda boda* (hired bicycle for transportation) from the bus stop to the market. Some LSTs with small quantities of seed saved on transportation cost by carrying goods on their heads and walking to the market. Some use bicycles especially the old women, said they were assisted to the market by their grandsons.

Storage: Storage charges were inclusive of security charges. The LSTs who rented storage space said that they were charged Ksh 300-500 per month. Some LSTs come together to rent one storage space and share the cost although some preferred to individually secure rental places because “your seeds are not tampered with by others” as explained by Hellen Kadimo. She also added “I am assured of security and peace of mind”. The traders who rent storage have large stocks of seed. Other traders store their seeds in their homes because their stocks are small and also lack money to rent storage space. Seeds are stored in gunny bags away from fire. During long storage LSTs protect seeds such as beans from pest infestation by mixing them with cowdung ash. Those who produce seeds ensure the seeds are properly dried before storing. All the traders said that they preserve their seeds well and pest infestation was not a problem. They also checked on the quality for signs of pest infestation before buying to avoid the problem.

County council levy: The LSTs interviewed said they were charged Ksh 10-30 a day for selling space in the market. The amount varies from market to market and also depended on the range and quantity of seeds and other commodities an LST was selling. The space allocated at the market was approximately 3-5 meters long.

Cost of buying seeds: This depended on the type of seeds, the buying centers and the season. LSTs buy packaging material at Ksh25.00 (that is a transparent polythene bag).

3.5 Constraints of local seed traders

There were many market constraints that emerged from the interviews.

- Many LSTs complained that sometimes they did not make any sales at the market but were still charged the county council levy. Some traders said that they were still charged even when selling by the roadside, which according to them was unfair. They also complained that the county council staff harassed them when demanding the market fees.
- Most traders said they lacked capital to expand their business. The profits they obtained from the trade were too little to add more stock and widen the range of seed varieties. The lack of money also forces them to buy stock in small quantities.
- The business is seasonal so that during the harvesting period the prices of seeds are low and the sales are also low. Sometimes the price of seeds goes up at the buying centers forcing them to increase price at the market. The LSTs say this causes a lot of complaints by the LSCs forcing them to lower the prices up to a point where the profit is marginal. There were cases where customers often fail to repay credit extended to them, thus affecting their cash flow.
- Some LSTs complained that they lack cooperation among themselves. Ruth Khakasa of Funyula market stated that some LSTs lower their prices secretly to increase their sales. In some marketplaces like Funyula, traders fail to agree on set prices on seeds they sell.
- Due to poverty, some LSTs like Florence Nakhumicha of Bokoli market said they use the proceeds from the sale of seeds to cater for household needs thus she finds herself without money to continuously replenish her stock. One trader said she uses the money as she receives it and since she does not keep records, she says she has no idea whether she is making a profit or not.
- Sometimes LSTs buy poor quality seeds whose sources they cannot trace affecting their image at the market. They however did not specify from whom they obtained the seeds.
- LSTs also lack formal credit facilities. They said the informal credit they extend to one another is not adequate to boost their business. They said they needed substantial amounts like Ksh. 10,000.00 and above to scale up their businesses and improve their returns.
- New LSTs at the local market stated that most LSCs avoided buying from them because of lack of familiarity. They said it took long before anyone could buy from them.

- The local seed traders who often double as seed producers also lacked transport to take their seeds from the farms to the road. The roads are in poor state which makes local transportation more expensive. They also cited lack of money to lease land as a constraint to local seed production.

3.6 Suggestions of local seed traders

LSTs suggested that there is need for capacity building to improve their existing knowledge on local seeds especially on seed bulking and multiplication to strengthen their seed sources. They also suggested that they should cooperate with one another to reduce their cost of operation in terms of transport cost and storage charges. Another suggested area was to form lobby groups to advocate for better conditions at the marketplaces and recognition by formal institutions to start working relationships with the government and other stakeholders in agriculture. LSTs said they would like to have access to proper packaging material as is done by the agro-vets so that the seeds they are selling look attractive.

4: LOCAL SEED CUSTOMERS

4.1 Local seed customers' preference for local seeds

Local seed customers (LSCs) are farmers who buy seeds from LSTs for the purpose of planting. They buy seeds at the marketplaces during market days and sometimes from the homes of LSTs in the villages. They said they visit different marketplaces for seeds according to availability and prices. They buy local maize seed, sorghum seed, millet, groundnuts and indigenous vegetable seed.

During the study we established that LSCs preferred buying seeds from LSTs for several reasons. First, those interviewed said that the prices of LSTs are lower as compared to those offered by agro-vets. For example, LSTs said that the price of 2 kg of certified sorghum seed at the stockist was Ksh. 270.00 while a 2 kg tin of local sorghum seed was Ksh 80.00 at the LSTs. The prices of LSTs are negotiable and also depending on the relationship one had, she could buy seeds on credit. The quantities LSTs sold are smaller and flexible, thus compatible with their farm sizes. The smallest unit of certified seed of sorghum and maize was 2 kg while local seeds are available in units as small as 250 g Since a majority of LSCs are small-scale farmers they get seeds commensurate with their farm sizes as confirmed by Angeline Auma “why should I buy 2 kg of maize seed and I only need to plant less than one-quarter of an acre?” She added “LSTs scoops extra amounts of seed to add on what I have bought”. Some farmers said that they can plant a variety of crops on their farms with a small amount of money. They also said that local seeds can be selected during harvesting, dried and stored organically and replanted later on without affecting their performances.

During focused group discussions, many farmers said that LSTs are located near them, thus seeds are readily available during the planting season. They also said that some of the LSTs are their neighbors, and for this reason they did not have to go to the market to obtain seeds. The seeds sold by LSTs are very well known and can be traced to a particular village. Some local seed varieties are named after a clan or village of origin. Therefore, LSCs know the performance of the seeds as opposed to those brought in by lorries –“which we use as food at our homes”.

Seeds that farmers buy from LSTs including indigenous vegetables and local varieties of maize, sorghum and millet whose flavor they say is unique. Local seed varieties are drought and pest resistant can only be found with the LSTs or neighbors who save seeds. LSCs are forced to buy from the market due to inherent poverty. They use up their preserved seeds for planting as food or sometimes sell to LSTs at throwaway prices. During the planting season, LSCs have to buy from LSTs.

4.2 Constraints of local seed customers

Most of the LSCs said when buying seeds for planting, they get confused about the type of seeds LSTs are selling. They did not know whether the grains are specifically for seed or food. The LST sell according to the demands of the customers and do not limit their sales to seeds. There is lack of differentiation by the LSTs so long as they cash in. Some LSCs complained that some LSTs use offensive language and act like their time was being wasted when one becomes too inquisitive. This is common during planting season when the demand for seed is high. During that period, LSTs often refuse to compromise on the price. The price of seed fluctuates from time to time without prior notice and some LSTs take advantage of the dry season and shortage of crops to increase seed prices.

LSCs stated that some LSTs are not honest with the measurement of quantities since they tamper with the measuring equipments/containers by hitting the bottom of the *gorogoro* (or measuring tin). The bump in the *gorogoro* takes up space in the container thus reducing the quantities of seeds. The quality of seeds in some cases is low. LSCs buy seeds from LSTs at their own risk since there is no guarantee that the seeds will germinate or perform well. One can find different varieties of seeds mixed up such that upon germination you can get three varieties of crop (for sorghum seeds one can harvest “Nagugu” mixed with Seredo varieties). At times, the seeds fail to germinate and since the trade is informal there is no legal redress. “The only thing we do is avoid buying from some LSTs”. LSCs also put the blame on Ministry of Agriculture extension officers for not advising them on suitable seed varieties to plant for a given season. They also blamed themselves for not further sorting out the good seeds from bad seeds/chaff after buying from the LSTs. Farmers often plant the seeds at the last moment following the onset of rains thereby experiencing uneven germination (see, for example, a typical local seed customer’s narrative in Box 2)².

² They stated that LSTs too do not sort their seeds for fear of reducing the volume for sale.

Box 2: Narrative of a typical farmer/local seed customer

Tobias Juma Barasa is a farmer in Mukweso village in Matayos division. He plants local maize, beans, kale and cassava on a 2-acre plot. He buys seeds of Kale at the agro-vet in Matayos because they are not sold by LSTs. He also saves seeds of local maize and beans, which he says was taught by his mother. He stores the seeds using ash obtained from burnt sheep dung for three months before planting. He says he is sure of the performance of the saved seeds and saves money by saving seed. He shares seeds with his neighbors and relatives but sometimes when he is in need of money he sells to them.

Tobias buys seeds from Matayos, Bumala and Busia. He says he prefers Matayos market because the seeds sold there are obtained from the local area. However he says the price of seeds at Matayos is higher than Busia. At the market, he buys seeds of Soya beans and sorghum. Like his group members, he assesses the quality of seeds visually before buying. He said that farmers in the area avoid buying maize seeds from Kitale because the maize crop germinates without tussling. He says this information has been there for a long time and like his group members, they do not know its source. He checks for the seed size, pest infestation and general damage. In his locality, he knows a breeder of local maize whose seeds he says perform well. The breeder sells to them limited amount of seeds.

Tobias says that sometimes the seeds they buy at the marketplace fail to germinate and there is no compensation. Since he knows the seed traders at the market, he avoids buying from the particular traders and makes sure his fellow farmers are aware of it. He says most LSTs are motivated by money so they take advantage of the rush by farmers to plant at the onset of rains to sell seeds whose quality and source are in doubt. His group members also said that they were to blame also because they do not take time to sort out seeds before planting. He says he would like to be trained on seed improvement and storage to enhance the performance of his crops. He has observed that the yields of maize on his farm have been decreasing over the seasons yet the seeds are from the same line. The agricultural extension officer present at the focus group discussion told him that it might be due to effects of crossing from neighboring fields that have made his seeds to be inferior. However, the extension workers promised to find out more information from Kenya Agricultural Regional Institute (KARI) at Alupe.

One problem that Tobias and his fellow group members face is the inherent poverty amongst them. He says that “sometimes we lack food in our homes, rather than starve, we consume or sell our stored seeds”. It is this habit that forces us to continuously buy from LSTs. This is a common practice for seeds of local maize, sorghum and beans.

He says the extension officers in the division should take time to talk to them on how to grow good seeds and store them. This is an area that the agricultural officers have never focused on. The agricultural officer at the meeting concurred with Tobias on the matter.

4.3 Suggestions of local seed customers

Based on the pilot study, most LSCs proposed that they need to be trained on seed selection and improved seed saving techniques and of good quality management (see also Box 2). This would ensure that the seeds they produce and sell to LSTs are of good quality. They were willing to form associations to improve local seed production and preservation --for release during the planting season. They suggested that a market information center be established for both LSTs and LSCs so that they know price before hand. This would enable them to trace the sources of the available seed and seed varieties in the local market. The market information center would be responsible for gathering market intelligence on local seeds from different markets, so that LSTs can know the prevailing market prices of different seeds. In turn, the information can help LSTs to determine where to buy their stock at reasonable prices so that farmers benefit too. A farmer who was familiar with the working of telecentres in Uganda suggested that “For the market information center to coordinate its activities, it would need community radios, internet and mobile phone systems. The community radios would be a source of constant updates on issues related to seed production and trading while the mobile phone system would be for communication between market information centers”.

Some LSCs suggested that the government and other institutions intervene to streamline the business to ensure that the seeds sold by LSTs meet quality standards.

5: MARKET INFORMATION AND RELATIONS

5.1 Market relations

The pilot study looked at the nature of relationship between local seed traders (LST) to fellow local seed traders (LST) and local seed traders (LST) to local seed consumer (LSC).

LST to LST: The relationship between seed traders was two fold. There were traders who discussed with fellow traders on issues related to seeds; and there were some who kept to themselves. Ruth Khakasa of Funyula market said “everyone does her own thing in the market, so I don’t bother with what other people do”. There are traders who said they hold discussions on how to fix prices of seeds. But this is not always successful because some traders try to lower prices behind their backs in order to increase sales. Some LSTs discussed the type of seeds to buy during a given season.

LSTs also assist one another materially and financially. Rashid Otonglo of Funyula market said he gives seeds to a fellow trader whose stock has dwindled so that their stock of seeds does not run out. The measuring equipments for seed is shared among LSTs seated next to each other. Some have set up merry-go-round (informal credit) to boost each other financially on a rotational basis. LSTs at the local markets extended credit to one another informally upon request. Some traders said they send fellow

LSTs to the bigger markets to buy seeds on their behalf. Wilbroda Sande of Matayos market said LSTs “next to her” sell seeds on her behalf when she is temporarily absent. Others said they help each other to load seeds on bicycles.

LST to LSC. Some LSTs said that the relationship with LSCs depended on the latter’s approach. For instance, some LSCs focus on buying seeds without asking any question. In the case of sorghum, some LSCs ask questions on the variety of the seed, that is, whether it is for the long rains or short rains. They also enquire about the method used for drying beans bought from Uganda because they believe “electronically” dried beans do not germinate and does not cook well. One trader stated that “business is about language that’s why I extend credit to farmers who continuously buy from me”. A majority of the LSTs said they normally discussed once a week when they meet during the market days.

At the marketplaces, some LSCs said they did not ask any questions. They however assessed the quality of seeds they bought visually before choosing a trader to buy from. In doing so, they checked for physical damages on the seed and looked for signs of pest infestation. They said good grain and bean seed should be “plump and shiny”. There are some LSCs who chewed the grains to determine its moisture content. “Good quality maize seed cracks easily when chewed while soft seed indicates that the seed has not dried well”. A farmer said she knows what to buy by comparing the seeds on sale with those that she planted and performed well. She added, this can only be done through observation.

Some farmers said they asked LSTs questions when they buy seeds at the market. For instance, they inquired about the variety of seed suitable for a given season, seed performance and negotiated prices of seed with the traders. However, members of a focus group discussion said that some LSTs get offended when they are asked too many questions concerning the seeds they are selling especially if they monopolize a certain variety of seed that is on high demand. One was told ‘you will walk around but you will still come back to buy here’.

Some relationships at the local seed market are family based. Most LSCs identify with LSTs whose families they know and so when they go to the market they spend time with the LSTs to talk on other issues not necessarily related to the business before buying seeds. Most LSCs said they sometimes provide feedback to the LSTs regarding the performance of the seeds they previously bought from them. They also share with fellow farmers and recommend to each other when the seeds are of good quality and which LSTs to buy from. The information is also shared regarding bad quality seeds.

5.2 Information exchange and local learning

All LSTs said that neither the government nor Non-Governmental Organization (NGOs) has ever discussed with them on issues related to seeds. One market center was approached by UCRC (Ugunja Community Resource Center) --a local CBO on a research mission of local trading in general. The local seed traders at the market stated that they did not know the subject matter of the study. The rest of the LSTs stated that our study was the only survey that was carried out with specific focus on local seed trading in the area --and hoped that it would lead to some immediate benefits for them.

The information networks at the local market operated informally. From the focus group discussions farmers stated that they identify good seeds by observing the performance of the crops on their farms. The information is passed on to neighbors and fellow villagers on the quality of seeds at a particular farm. Mr. Barasa, a farmer said that ‘we know Alberto always has adequate seed for maize but limits his sale to only 1 or 2 kilos per individual. Everyone in the village knows he has very good seeds.’ LSTs said they introduce new local varieties and allow villagers or farmers to try them out on their farms. The farmers informally provide feed-back to the traders on the performance of new varieties --whether negative or positive and depending on the feedback, LSTs decide on a course of action. For example, LSCs from Busia said that hybrid maize seeds originating from Kitale do not grow well in that area. Informed sources close to them (who they were reluctant to name) say that “seeds germinate and grow tall without fruiting”. They also said that electronically dried beans do not germinate at all regardless of the weather and when cooked they do not soften. This information is well known among the farmers and some have never bought them. As one LSC said “We avoid these seeds even though they are cheap”.

The elderly LSTs depended on generational flow of information regarding seeds, which was mainly verbal, and through reproduction from their parents and grand mothers. Leonida Atiando of Matayos market said she learnt how to produce, select and store indigenous seed vegetables from her mother. Most married women stated that they came with seeds from their parents and the seeds have multiplied and spread within and outside the village.

On local learning and adaptation, in markets where the information on seed prices is secretive, the LSTs takes the initiative of investigating the prevailing prices of the seeds they are selling before they set their price. This was the case in Nyadorera market and Funyula market.

Some LSTs besides selling seeds, sell other consumer goods as well on a small scale. The goods include tealeaves, curry powder, magadi soda (soda ash), dried cassava and salt. They said this supplemented their income from local seed trading and due to the seasonality of seed trade they depend on the alternative trade for income generation. But as Leonida Atiando of Matayos market said “local seed trading is much better”.

Due to lack of money to buy additional stock, Sofina of Bokoli marketplace said she is forced to sell the grains stored as food or seed so that she does not run out of business. Most of them stated that they depended on the merry-go-round to meet other personal financial needs to avoid using the proceeds from the sale of seeds.

LSTs ensure to buy good quality seeds and use persuasive language in selling to LSCs. This is common when the demand for seed is low. The elderly LSTs take advantage of being around in particular markets for a long time and are mostly associated with experience and trust relations in selling quality seed and also identified with specific LSCs.

6: SUMMARY AND WAY FORWARD

6.1 Summary of the study

From this pilot study (**also refer to a series of still pictures in Appendix 2**), we established that LSTs are found at the local market places near their villages. The traders sold seeds in small quantities that are measured in relatively small containers affordable to the small-scale farmers who are the major customers of LSTs. They operate in more than one market to take advantage of many customers who come in a particular market place during its market day. At the market, they display the seeds on woven basket trays or well-spread manila bags of different sizes under the open-air market. Their business is unregistered and has existed like that for a long time. A majority of LSTs operate the trade solely. The farmers' or customers' demand for grains/seeds are mixed especially for local maize, sorghum, groundnuts and beans. Depending on the request, LSTs sell grains as either seeds or food. LSCs were drawn from villages around the market places while some came as far as 30 km away. LSTs also sell from their homes where they accept other items or food crops in exchange for seed. They also sell on credit to reputable LSCs.

Based on market interviews, most LSTs got into the business to earn a living in order to meet household needs. This was common among the elderly and the widows who were the sole breadwinners in their households. They also got into the trade to diversify their sources of income. Besides selling seeds, they sold consumer goods like magadi soda (soda ash) and curry powder in small quantities. LSTs gained experience through i) learning the trade from their parents, ii) other traders and iii) self initiative. They started in different ways: some started by selling other commodities before venturing into the seed trade; some started by selling one line of seed before expanding to wide range of seeds; while others were advanced loan in form of seed by other traders. Most LSTs started their business at the local market.

The seeds sold at the local market are acquired from different sources. There are those who produce seed but also buy or exchange other crop seeds they do not produce. Those who buy their seeds do so from farmers, middlemen and from bigger markets located in town centers such as Busia. Seeds of local maize, sorghum, groundnuts and beans are bought from Uganda during the dry season.

The relationship that exists among LSTs is two fold. Some prefer to keep to themselves while others discuss with their fellow traders on setting prices and the types of seeds to buy during a particular season. They assist each other by offering credit, buying each other seeds and sharing the measuring containers. LSTs also give

advice to farmers upon enquiry on suitable seeds for a particular season and agree on the price --although some do not entertain questions. LSCs provide feed-back to LSTs and among other things on seed performance whether negative or positive. LSTs have their informal ways of accessing information on new local varieties in the market. They depend on fellow villagers, traders and own market survey for information. As well, they depend on existing local seed knowledge and practices which have been passed on to them through parents from generation to generation.

LSTs have never been assisted by the government or any formal organizations on ways to improve their financial or technical knowledge. In this context, LSTs are faced with several constraints. These include: lack of capital, lack of cooperation among themselves, inherent poverty and price fluctuations. Meanwhile, some of the constraints that affect the LSCs such as price fluctuations are often unpredictable. Poverty makes LSTs not to save money and seed. The same applies to LSCs, who due to poverty sell their seeds at throw away price to the LSTs. Despite these problems, LSTs have learnt to survive for a long period of time. Some have small businesses alongside seed trading and offer informal credit facilities among themselves to boost their trade. The costs of operation for the LSTs include storage charges, transport costs (vehicle and/ or *boda boda*), market levy and cost of buying seeds.

In conclusion, LSCs play a vital role in the seed trade because their need of quality of seeds and varieties determines what seeds the LSTs will sell at the market. To retain existing LSCs and attract new ones, LSTs have to maintain their integrity at the marketplace. They also have to source for quality seeds at reasonable prices.

6.2 Areas of to be considered for intervention

The areas to be considered for further exploratory work and action-oriented projects – with research support include:

Exploratory research areas

1. Explore the changing knowledge systems of local seed production and marketing in the study area. This entails understanding the traditional way of seed saving, how this has changed and the the main determinants of this change. For instance, are Agrovets or seed merchants and LSTs inducing farmers to grow new seed varieties? The Agrovets involve introduction of new seed varieties. Also, LSTs are increasingly buying their seeds from larger markets as opposed to selling what they have bought from LSCs or produced themselves. On the supply side, this new development means that LSTs are becoming intermediaries. On the demand side, the high incidence of poverty and food insecurity seems to introduce new dynamics in Busia and Siaya districts. For this reason, it is important to explore how farmers –especially in Funyula and Budalangí divisions have moved into this rapidly growing local seed markets.
2. The need to map various trading levels and their values/volumes (trading value chain) and explain the development. For instance, sources of seed (middlemen on bicycles and at bigger markets) for the LSTs should be

interviewed to complete the whole informal seed market chain and establish the nature of relationship they have with LSTs. Also, there is need to explore opportunities for formal organizations and institutions (viz. research and extension organizations and government regulatory agencies) to establish links with local seed entrepreneurs and customers.

3. Examine how local seed producers and traders search for information on existing and new seed varieties. For instance, a majority of LSTs said they discussed once every week when they meet during market days. Thus, it is useful to explore the type of information the local seed entrepreneurs and customers exchange and its implications on local seed production and trading.
4. Explore resource allocation to local seed businesses. Local seeding is a seasonal business which is complemented by different activities throughout the years. Thus, it is important to map the time spent by smallholders on local seed trading in relation to other agricultural activities. Also related to this issue is to find out whether local seed traders (LSTs) are more efficient than farmers or local seed customers (LSCs). To do this, it is useful to estimate the range of cash flow and budget of LSTs and LSCs and how this relates to their other household income and expenditure. Also, given the informal way of record keeping by LSTs, it is useful to explore how LSTs calculate their profits and decide on when to increase or reduce their stock of seeds.

Project areas

1. Building the capacity of LSTs to improve their knowledge of local seeds especially seed bulking, multiplication to strengthen the local seed sources. The project would mobilize local seed entrepreneurs to form seed business groups (SBGs) or seed business associations (SBAs) in order to enjoy the benefits of association. For the seed traders at a specific marketplace, coming together would distribute/reduce the cost of transportation, storage and improve their chances of accessing credit. For the farming association, it would enhance the quality of seeds being sold at the local markets. The associations can also lobby for recognition by the government and other stakeholders in the seed industry so that local seed systems can be improved. SBGs and SBAs would also enable members to gain access to market aids such packaging material and information.
2. Building the capacity of farmers to breed local seeds for own use and sale. The project would identify their knowledge and skills in seed selection, multiplication, storage and marketing with the aim of building their capacity to become trainers of young interns as well as other farmers in the community. The neighbouring farmers would be organised to form clusters around such farmers/breeders who would become trainers. Capacity training for smallholders would also include entrepreneurial skills especially on record keeping and stock taking. Since most respondents expressed need for credit, they could be trained on basic business planning and credit management.
3. Support local seed producers to establish seed stores in the area so that individuals from farming groups can bring seeds for storage. They would set

- up standards for quality and ensure that seed demonstration plots are located strategically for other farmers to assess the crop performance at various stages of growth in order to share the information thereby creating demand for the local seeds. The stores would certainly stabilize prices. For instance, the seeds could be bought from producers at an agreed price. The group members would manage the store and sell directly to farmers and other LSTs. The seed stores can start by specializing in one crop before expanding to other crops.
4. Setting up market information centres to assist both local seed traders (LSTs) and farmers or local seed customers (LSCs). The market information center would be responsible for gathering and disseminating market information on local seeds from different markets, so that LSTs can know the prevailing market prices of different seeds. This would help them to link their seed production and local trading to appropriate markets. The project could explore how a given market information centre can coordinate activities of local seed entrepreneurs and customers through bulletins, mobile phone systems, internet and community radios. Based on “action-oriented research” approach, the project will evaluate the most cost-effective methods of communication for linking local seed entrepreneurs to market and non-market agencies.

APPENDIX 1: MAP OF KENYA

APPENDIX 2: PICTURES OF LSTS and LCS IN WESTERN KENYA