An Evaluation of Access to Information on Passion Fruit Production by Farmers in Keiyo North District, Kenya

By

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A report presented in partial fulfilment of the degree of Master of Agriculture in Information and Communication Management (AICM) at the University of Nairobi

2013

DECLARATION

This project report is my original work and has not been presented for a degree in any other University

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DEDICATION

This work is dedicated to the Almighty God whose abundant blessings have made this achievement possible.

ACKNOWLEDGEMENT

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ABBREVIATIONS AND ACRONYMS

ASDS   Agriculture Sector Development Strategy

GoK   Government of Kenya

HCDA   Horticultural Crops Development Agency

ICT   Information Communication Technology

KM   Knowledge Management

MoA   Ministry of Agriculture

NASEP   National Agricultural Sector Policy

NGO   Non Governmental Organisation

SMS   Short Message Service

SPSS   Statistical Package for Social Scientists

T.V   Television

ABSTRACT

Passion fruit farming is viewed as a viable enterprise in Kenya as an income generating activity. Its farming is gaining popularity in the country and trends for 2002-2010 show its production increasing yearly in Keiyo North district amid various production challenges. A study was conducted to evaluate the access to information on production of passion fruit by farmers in the district. Data was collected through key informant interviews, focus group discussion and administration of a questionnaire. The data collected was on social and economic characteristics, passion fruit management practices, access to initial/current information and dissemination channels. The major findings of the study were that 62.7% of farmers who were the majority, rely on fellow farmers for initial information on production and on extension agents for subsequent information. *Baraza*/field days were ranked as the most common method of information dissemination. The group approach was found to be popular with 80% of the farmers. This study concludes that there is need to equip farmers with more information which is well structured to suit the needs of the passion fruit farming community.

1.0 INTRODUCTION

1.1 Background

Passion fruit farming is gaining popularity in Kenya and trends for 2002-2010 show the fruit increasing yearly in Keiyo North district (MoA Annual Report, 2011). Studies have shown that there is a risk of the production levels declining despite the popularity of growing passion fruit. Otipa *et al.* (2011) identified disease incidences, use of non-grafted purple passion fruit planting material, poor disposal of diseased planting material and use of improper chemical compounds for pest control as some of the constraints of passion fruit production in the North Rift region of Kenya. These challenges could be attributed to inadequate access and utilization of information on passion fruit production among farmers (Ogboma, 2010). The access to information on passion fruit production and channels of communication of these technologies employed by extension agents were the focus of this study.

All over the world, the task of providing agricultural production information is vested with agricultural extension services. Agricultural extension workers role in America has been to improve agricultural activities and this is achieved by educating farmers on new ideas through use of newspapers, radio or television and demonstrations on farm operations (Magaji, 1986). In India, it is government agencies or the public extension systems which take up the role of providing agricultural information to farmers (Kameswari & Gupta, 2011). Other studies conducted in Africa concur. In Nigeria, studies show that agricultural information is not readily accessible to farmers and this is attributed to insufficient agricultural extension officers, lack of use of media, language barriers and the unreliable nature of electricity for communication (Ogboma, 2010).

Extension services have historically been an important source of information in Kenya. The services are focused mainly on food crops and livestock (Muyanga and Jayne, 2006). Agricultural technical information includes cropping practices such as land preparation, nursery, irrigation and fertilization, crop protection, harvesting, post harvest handling and product processing (Oladele, 2006). Currently, agriculture extension services in Kenya are provided by both government and private sector. Gautam (2000) also advocates for pluralism in extension services by allowing alternative providers, particularly private suppliers, to enter the market.

The National Agricultural Sector Policy (NASEP, 2011) recommends that government should establish an integrated and dynamic database for the sector, improve access and utilization of generated information and experiences.

In addition it should increase investment in agricultural information and knowledge systems, including capacity building in Information Communication Technology (ICT) and establishing information points in rural areas. The need to harmonize standards for packaging of user-friendly extension messages, encouraging use of participatory learning approaches and improving the reliability of information exchanged through farmer-to-farmer interaction is identified. The importance of using the existing informal channels for enhancing the two-way flow of information between advisors and farmers is emphasized. Motivating the private sector through interventions such as rural electrification and lowering tariffs on solar power, to set up and operate ICT-based rural information centres and establishment of community-based radio is recognized in NASEP policy. Possession and distribution of knowledge is the most problematic task in knowledge management since knowledge which is not distributed has a very low value for organizations (Yaghoubi, 2011).

Agricultural approaches and models have been proposed and implemented in Kenya in an effort to address inefficiency in extension service. Subsequently technological adoption has lacked new strategies to achieve agricultural development objectives. Old extension system models embraced conventional training and visit approaches. With the ever dwindling number of extension workers in Kenya, conventional extension methods have become difficult and costly to operate. Current extension approaches advocate for group and mass methods so as to cover most farmers in the country. The methods are thought to be more cost-effective in reaching the farming community (Omolo and Wanga, pers. comm). To be more effective, extension systems should incorporate new technology in the provision of its services to clientele. Perishable food crops especially fruits and vegetables require information sharing and management to increase efficiency in production. It is therefore appropriate to utilize new technology and develop new strategies for increasing efficiency in provision of extension services.

One of the crops for which extension services are provided is passion fruit. Passion fruit (*Passiflora edulis*) is a perennial climbing plant, which was introduced in Kenya in the 1920's. There are two distinct forms: *forma edulis*, the purple passion fruit, occurs in cool environments at higher altitudes, and *forma flavicarpa*, the yellow passion fruit, which is common in tropical lowlands. It is now a popular fruit for both domestic and export markets. The purple passion fruit (*edulis*), commonly grown in cool environments at higher altitudes, is the variety grown in the North Rift region of Kenya (infonet-biovision, 2012).

Improving access to information on passion fruit production that farmers need to increase production, will not only equip farmers with better ways to improve production but also

motivate them to adopt the recommended passion fruit production technologies in order to produce more fruit for the market and consequently increase their income. This could be achieved by evaluating the existing information that extension agents disseminate to farmers, the channels they are using and determining a communication framework that can contribute to increased productivity of passion fruits in Keiyo North district.

1.2 Problem Statement

Passion fruit has been identified as one of the crops with high potential in North Rift and especially in Keiyo North district. There is huge demand for passion fruits both in the local and export markets (Macharia, 2007).

The limited availability of passion fruits on markets in Kenya and other urban centres is attributed to farmers using outdated methods to produce passion fruits and have not embraced new technologies of passion fruit production. Access to information on how best to address problems of yields, disease and technologies are a major challenge to the farmers. The mode of information delivery and subsequently access to information by farmers is a challenge to agricultural production as suggested by Ogboma (2010) in addressing passion fruit production technologies.

Failure to use modern methods of passion fruit production is as a result of inadequate production information on the technologies.

This study therefore seeks to assess the types of information available and accessed by the passion fruit producers and subsequently identify communication channels used to disseminate information.

1.3 Overall objectives

The main objective of this study is to evaluate access to information on passion fruit production by farmers in Keiyo North and suggest alternative ways of communication of production technologies to the farmers.

Specific objectives of the study are:

1. To assess the type of information available on passion fruit production technologies

2. To assess the communication channels used by extension agents to disseminate passion fruit production technologies to farmers

3. To make recommendations on the communication framework for disseminating information on passion fruit production technologies to farmers

1.4 Research Questions

The following research questions were addressed in this study:

1. What type of production information is available to the farmers?

2. Do social characteristics (gender, age, level of education and number of children) of farmers affect choice of communication channel for passion fruit production information?

3. How can modern communication channels be used to enhance delivery of passion fruit production technologies to farmers in Keiyo North?

1.5 Justification

Passion fruit has recently become one of the most popular farming activities in Keiyo North district. The fruit has a large market outlet in Kenya as well as across the border in Uganda where passion fruit juice is very popular.

Passion fruit pays highly and within a short time, has a ready market and it compensates farmers for their effort in production. Other farming enterprises, such as maize production are very labour intensive and take long to give returns to farmers. Thus, a study to evaluate access to passion fruit information by farmers in Keiyo North district.

1.6 Scope

This study was carried out in Keiyo North district of Kenya. The study focused on information related to passion fruit production technologies.

1.7 Definition of terms

- **Extension agent** - an employee of the Ministry of Agriculture or private sector with technical agricultural skills

- **Passion fruit production** - the processes and methods employed in growing passion fruits in the farm until when they are ready for market

- **Farmer -** a person who earns a living by growing crops or keeping livestock

- **Market -** A market is any place where the sellers of a particular good or service can meet with the buyers of that goods and service where there is a potential for a transaction to take place

- **Technologies -** The application of scientific knowledge for practical purposes, especially in agriculture. Examples of passion fruit technologies are:
    - Reducing incidence of diseases and pests in the purple variety by use of certified planting material such as grafting with the yellow variety and using it as root stock
    - Removing old unproductive shoots and dead wood when pruning

1.8 Conceptual framework

The concept of evaluating access information provided a means of understanding and predicting the outcomes of the communication process employed by extension agents in provision of passion fruit production information. It also paved way for the recommendation of a communication framework that embraced principles of knowledge management to improve the access to information by the farmers. The framework took into consideration the already available information with extension agents that farmers need to improve productivity. The most effective communication channels that were identified will be used to improve communication between extension agents and farmers by improving current situation of the farmers.

PROBLEM		INTERVENTION		DESIRED OUTCOME
Poor communication of technologies to farmers *Farmer Characteristics* • Age • Gender • Lever of education • Number of children • Farm size • Enterprises • Farm income *Government Policies* *Market Characteristics* *Geographical Issues*	Improve communication technologies → ←	Establish a Communication Framework *System components* • Passion fruit production technologies • Communication channels • Extension personnel capacity building • Strengthen farmer-farmer extension	Improve communication technologies → ←	Improved farmer livelihood *Indicators* • Increased productivity • Enhanced market access • Increased household incomes

Source: Own conceptualisation

Figure 1. 1: Conceptual Framework

2.0 LITERATURE REVIEW

An evaluation is the systematic acquisition and assessment of information to provide useful feedback about some object (Trochim, 2006). Establishing how technology is delivered can be done through qualitative and quantitative methods. Qualitative methods can be utilized to gather general information on the area through observations, conducting key informant interviews and focus group discussions. Quantitative methods are employed in evaluating the actual problem that has been identified through administration of questionnaires to the target population of passion fruit farmers.

2.1 Agricultural Information

In her study of access to information of fish farmers, Ogboma (2010) posits that access to agricultural information is a known farmers problem.

> *Agricultural technical information includes cropping practices and the related activities, including agro-environment analysis, land preparation, nursery, irrigation and fertilization, crop protection, harvesting, post harvest handling and product processing. Business information is information related with economical aspect of agricultural sector, including capital, finance, and market information* (Oladele, 2006).

Provision of agricultural information remains a domain of agricultural extension workers/agents. The general approach to extension involves use of trained personnel to provide various services to farmers that include transfer of technology, advisory service and human resource development (Aker, 2010).

2.2 Communication channels

There are many different channels of communication used by extension agents to transmit agricultural information to farmers. The use of radio and newspapers are more common and accessible while fax, email and internet have low coverage due to their dependence on landline infrastructure (Aker, 2010).

The more traditional methods of extension rely on face-to-face methods hence the use of field visits and field days.   Szóstek, Markopoulos & Eggen (2011) regard face-to-face communication as a rich communication channel because one can take advantage of social cues.

The sources of information and media that farmers have had access to range from interpersonal sources such as friends and elders to new ICTs like mobile phones however, mobile phones have rarely been used to access agricultural information (Kameswari & Gupta, 2011).   According to Gautam (2000), some of the earlier recognized channels for disseminating technical knowledge in extension were field days, bulletins from research station bulletins, publications by Agriculture Information Center (AIC) on recommended practices and *barazas,* public meetings called by the chief, the location administrative officer, or local extension staff. Most of these are still in use. Okwu & Daudu (2011) in their study on extension communication channels established that interpersonal communication channels were more available, accessible and used by farmers more than mass media.

A case study of physical, political and local practice as barriers to agricultural development, unequally distributed information and political power was reviewed. It was established that

economic researchers and policy makers should not duplicate policies for implementation in any geographical or social context, even if they were successful elsewhere (Mbatha & Antrobus, 2011).

2.3 Theoretical framework

The study is supported by communication and knowledge management theories. Two theories have guided this study. They are the Harold Laswell communication theory and the Nonaka and Takeuchi model of knowledge conversion.

The Harold Laswell theory states ***"Who says what in which channel, to whom and with what effect?"*** (Littlejohn, 2011). His model includes considerations of a variety of factors being considered to determine the impact of a communication. In this case, "who" is the extension agent giving extension messages through various channels which include field days, written materials (books, pamphlets, brochures), barazas/field days and even mobile phone. "To whom" is the farmers. "The effect" is how the farmers receive the message and whether they put it into practice to improve their productivity. This theory is aimed at the overall effect achieved by the communication through an appropriate channel.

The Nonaka and Takeuchi Model of Knowledge Conversion describes knowledge creation as a continuous and dynamic interaction between tacit and explicit knowledge in the knowledge spiral. Nonaka's theory is based on the notion that there are two types of knowledge, explicit and tacit (Dalkir, 2005). Explicit knowledge is that which can be transmitted, it is codified, tangible and can be easily articulated. Tacit knowledge is embedded in the human person, it is difficult to explain and is characterized as personal skills and mental models.

The model has four modes of conversion namely; conversion, socialization, combination and internalization. Socialization is the process of converting one individual's tacit knowledge to another individuals tacit knowledge through interpersonal interaction. Combination is the process of creating new explicit knowledge by reconfiguring, re-categorizing and re-conceptualizing existing explicit knowledge, while internalization is the process of converting explicit knowledge to tacit knowledge. This model shows how extension agents obtain knowledge from formal learning institutions, explicit knowledge. This knowledge undergoes transformation as they apply the knowledge in passing extension messages to farmers thus it becomes tacit knowledge. Having an understanding of the stages of knowledge conversion can help improve how production technologies can be better transmitted to farmers.

Knowledge is information possessed in the mind of individuals, it is personalized information related to facts, procedures, concepts, interpretations, ideas, observations and judgments (Alavi & Ledner, 2001). Successful knowledge management is defined by capturing the right knowledge, getting the right knowledge to the right user, and using knowledge to improve organizational or individual performance (Jennex, 2009).

"Knowledge management is a managerial activity which develops, transfers, transmits, stores and applies knowledge, as well as providing the members of the organization with real information to react and make the right decisions, in order to attain the organization's goals." (Yaghoubi, 2011).

Agricultural knowledge management thus becomes one of the roles of extension agents to keep farmers up-to-date with current farming technologies. Managing agricultural

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knowledge is one of the key roles of agriculture extension. Farmers rely on this knowledge to produce crops and livestock for the markets and improve their livelihoods.

For the agricultural industry to attain sustained and competitive development in Kenya, information generation and dissemination in all aspects of agriculture have been identified as necessary. They should embrace the entire value chain and cover from production to market of agricultural products as well as distribution systems and marketing channels (ASDS, 2010).

(Yaghoubi, 2011) posits that many organizations with an intention of establishing knowledge management have invested in the field of information technology and further recommends that in order to achieve success in knowledge management, the employees of an organization should be encouraged to educate and learn from each other, collective sessions should be regularly held for interchanging the ideas and comments of employees, and using suitable hardware and software, the access to organization's knowledge base shall be facilitated for the individuals.

3.0 METHODOLOGY

3.1 Study area

The study area was Keiyo North district of Rift Valley province. It is one of the 18 districts in Rift Valley province. The area was found suitable for the study because the farmers in this district grow passion fruits and interact with extension agents.
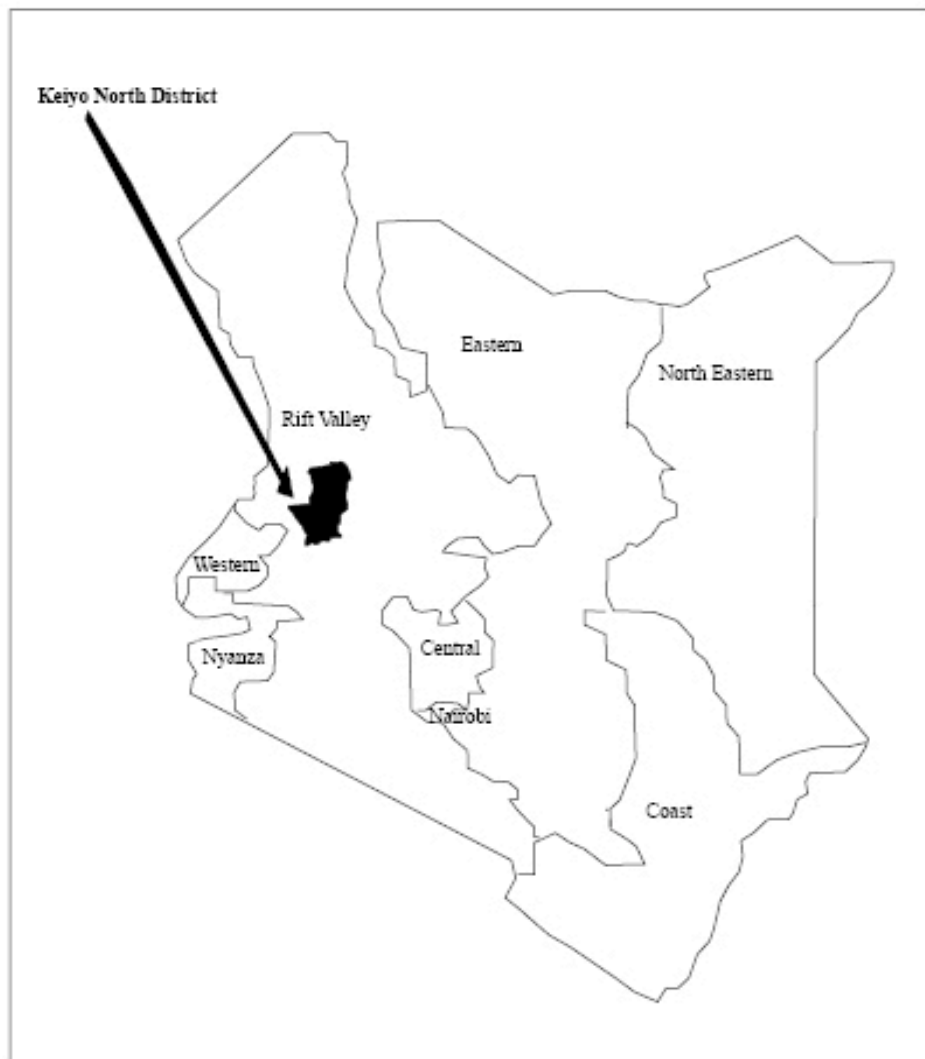

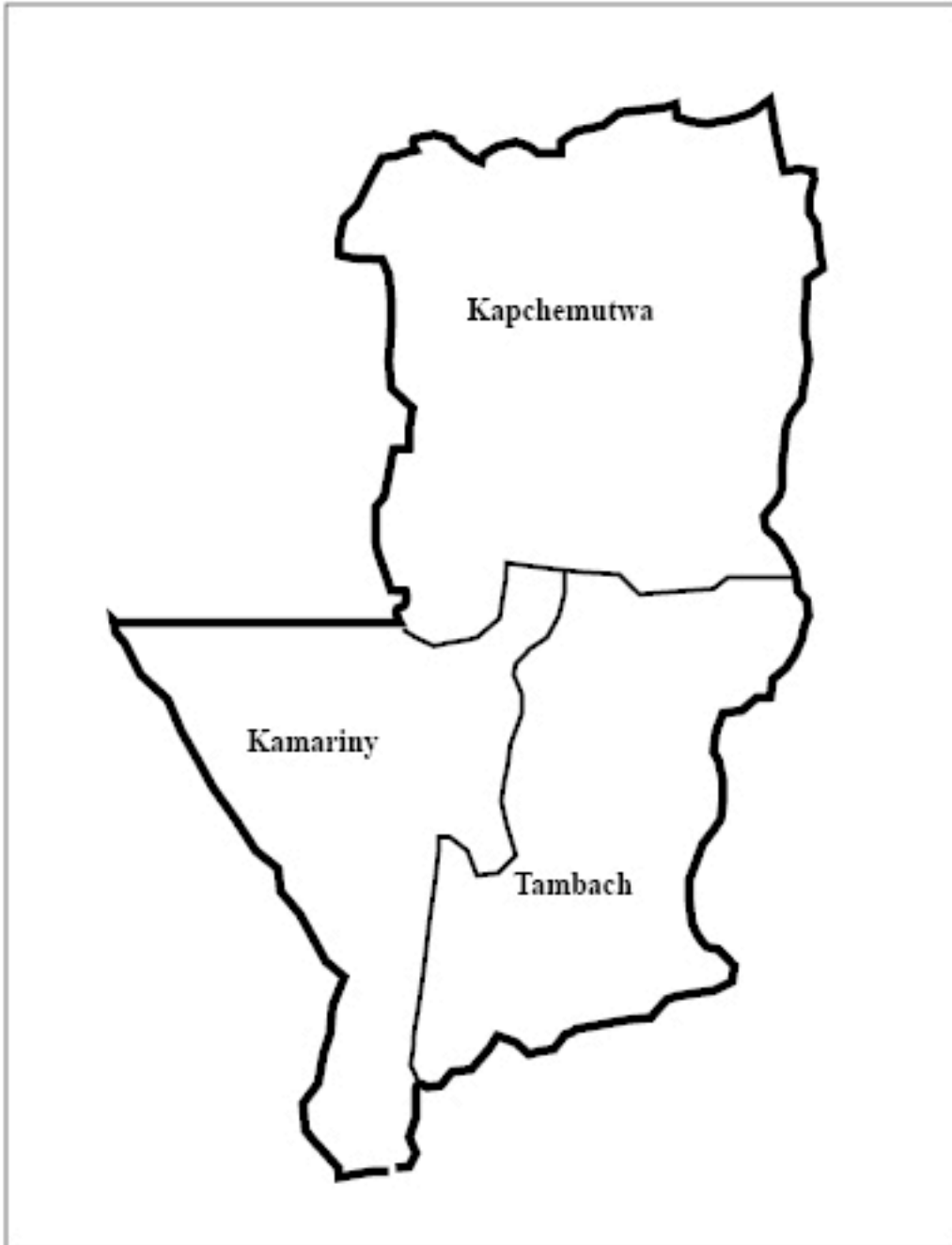**Figure 3.1:** Map of Kenya showing the study area - Keiyo North District

Figure 3. 2: Map of Keiyo North District showing its three divisions

The district borders Eldoret East District to the west, Marakwet West District to the East, "Larger" Baringo District to the South and Keiyo South District/ Koibatek District to the North. The district covers an area of approximately 542 km^2. Highland region covers 210 km^2 while the Escarpment & Valley covers 332 km^2.

Administratively, the district is divided into 3 divisions namely; Kamariny, Tambach and Kapchemutwa divisions. It has 10 Locations. Keiyo North district forms Keiyo North constituency.

The district's agro-climatic zones range from the upper highlands UH1-3 (1900- 2200m asl), escarpment which is upper midland UM3 and lower midland LM4 (1200-1900m asl) and the valley which is lower midland LM 3-4 (900-1200m asl).

The estimated population of Keiyo North district is about 73,715 (2009, GoK census). There are 8,086 farms and 10,078 farm families. Land ownership is freehold. Land use is characterized by mixed farming, the growing of crops and keeping of livestock, mainly at subsistence level. Agriculture is the main economic activity in the district with crop farming being dominant followed by livestock rearing and business.

3.2 Sampling

This study was designed as a cross-sectional field survey. The primary data for the study was collected at one point in time. A key informant interview was conducted with extension agents. It was used to gather the types of data available on passion fruit production technology in Keiyo district.

The population for the study consisted of all farmers in Kapchemutwa division growing passion fruits. A list of 145 farmers was provided by the Keiyo North District Agriculture office. Every third farmer on the list was targeted as a respondent. In the event that the third targeted farmer was not available, then the next farmer on the list was interviewed, thus a total of 51 farmers were obtained, to whom questionnaires were administered.

3.3 Data collection

Data collection procedure started with key informant interviews of extension agents, a focus group discussion with 10 passion fruit farmers, followed by administration of questionnaires.

The key informant interview was conducted on extension agents to establish what extension messages and channels they used to deliver passion fruit production technologies to farmers. The main data collection tool used was the questionnaire. It was administered to respondents and used to gather information on the channels used by extension personnel to disseminate information on passion fruit technologies to farmers. Data on farmers' personal characteristics such as age, gender, level of education, size of farm, number of enterprises and number of children was collected.

3.4 Data analysis

Descriptive statistics were employed in data analysis. The data was presented in tables, graphs and charts.

4.0 RESULTS

4.1 Key informant interviews

Key informants in this study were extension agents from public and private sectors. They provided general information on the study area, extension messages they disseminate to farmers and the communication channels used.

Background of passion fruit farming

Results show that none of the farmers in Kapchemutwa division have grown passion fruit for a period of more than 10 years. It started with a few farmers growing and later spread to many farmers after observing the few making a good income from passion fruit farming.

Extension messages

The extension messages given to farmers are on land preparation, seed selection, establishment, agronomic practices, pest/disease control, safe use of agrochemical, post harvest handling, value addition and marketing. The Horticultural Crops Development Authority (HCDA) agents, laid emphasis on obtaining clean source of planting material.

Communication channels

The channels used by extension agents to disseminate agricultural information are demonstrations, *barazas*/field days, exhibitions, farmers tours/ exchange visits and shows.

Challenges

According to extension agents, the challenges faced by passion fruit farmers include: certified seed not readily available, high cost of certified seed when available, high cost of agrochemicals for pest and disease control, high initial costs of establishment and dependence

on rain fed production.   The problem of diseases is attributed mainly to use of infected planting material during establishment of passion fruit crop.

The challenges faced by extension agents include: shortage of extension staff, poor staff mobility to the field and poor infrastructure.

4.2 Focus group discussion

Farmers background

It was established that the farmers who grow passion fruits have different backgrounds, some have always been farmers, others are teachers, civil servants and others are retired from other different careers and have now settled down to practice farming.   The data shows that both men and women of different ages are involved in passion fruit farming.

Before starting to grow passion fruits, some practiced mixed farming and kept livestock as well as growing crops.   They keep cattle, goats and chicken.   The different crops they grow include maize, beans, sorghum and various types of vegetables including cabbages, kales and tomatoes. When passion fruit was introduced, it became popular because they are able to earn from it over a longer period of time as compared to maize which takes up to 6 months in the farm before being harvested and marketed. They still continue the practice of mixed farming and also crop farming but they make sure they have a passion fruit crop at all times.

Their view on passion fruit farming is that it is a viable enterprise, although it is costly because they need to use chemicals for disease and pest control. They like passion fruit production because they are able to harvest and sell weekly for about 10 months.

Access to information

The sources of information available to the farmers are fellow farmers and extension agents. These agents include private companies like Technoserve, Horticultural Crops Development Authority (HCDA), Non Governmental Organisations (NGO) and Ministry of Agriculture extension staff. The farmers get regular information on best practices through meetings, seminars and field days.

Farmers receive extension messages on how to establish passion fruit, how to prevent pests and diseases, guidelines on proper pruning and crop rotation. They face challenges in obtaining information as individuals because they fear to ask questions except when they are in a group.

Extension messages reach farmers through meetings and farm visits. Farmers consult each other a lot, much more than they consult extension agents. Their coping mechanisms when challenged with access to information is to result to own devices and try out different chemicals, some opt to disregard extension agents advice while others will rely on the advice of fellow farmers. The group approach to extension is preferred. They said it works except when fellow farmers fail to attend group meetings.

Preferred communication channels

Modern technologies that farmers would be willing to use include mobile phones, posters and announcements. They would prefer if short text messages (SMS) would be sent to call for meetings, posters should be distributed widely to inform of an upcoming event such as a field

day with clear information. Announcements could be made on radio or in church to ensure there is a wide reach and that as many people as possible are able to receive the information.

4.3 Questionnaire analysis

4.1 Social and economic characteristics

The sample consisted of 51 passion fruit farmers in Keiyo North district. 33 were males and 18 females Figure 4.1 shows the percentages.
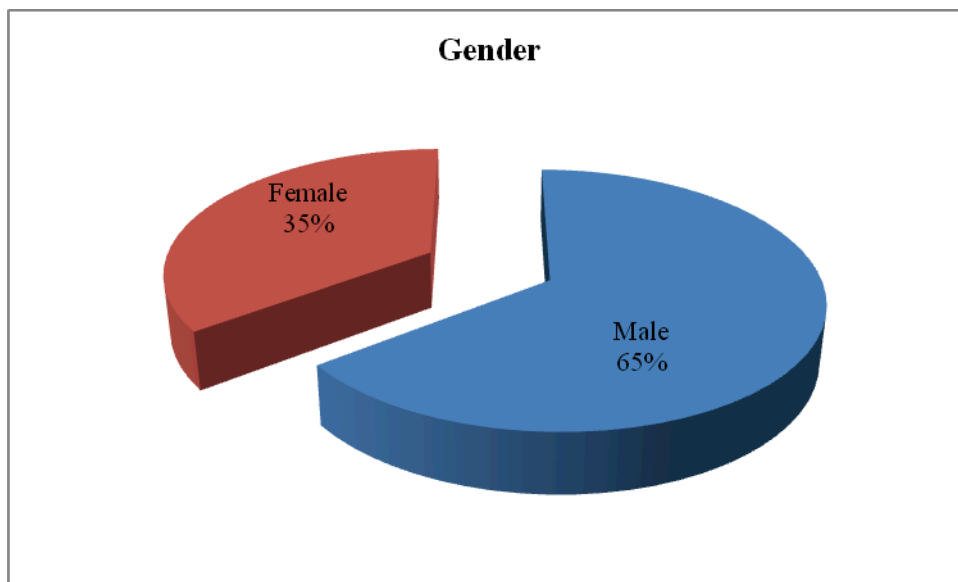
Figure 4. 1: Gender of respondents

The findings reported in Table 4.1 show a median age of the sampled population to be 31-60 years.

Table 4. 1: Age of respondents

Age (Years)	Frequency	Percent
Below 30	13	25.5
31-60	33	64.7
61-90	5	9.8
Total	**51**	**100**

Out of the sampled population, 3.9 percent of the respondents indicated that they had not attained any education, 62.7 percent had primary level education, 25.5 percent had obtained secondary education and 7.8 percent had obtained tertiary education.

Table 4. 2: Highest level of education attained by respondents

Education level	Frequency	Percent
None	2	3.9
Primary	32	62.7
Secondary	13	25.5
Tertiary	4	7.8
Total	**51**	**100**

Table 4. 3: Number of children

Number of children	Frequency
0	2
1 - 3	22
4 - 6	46
7 - 9	24
10 - 12	4
Total	**50**

The findings in this research revealed that approximately 46 percent of the sampled respondents had between 4 and 6 children while 2 percent did not have any children. One individual did not respond to the question on number of children.

All the respondents were growing passion fruit and also engaging in other farm enterprises as shown in the Table 4.4.

Table 4. 4: Farm Enterprises of Respondents

Farm Enterprise	Number	Percent
Passion fruit	51	100
Maize	43	86
Beans	16	32
Other	16	32
Dairy	13	26
Wheat	4	8

The table below shows the different practices performed by the respondents. All the farmers practice disease control. The activities practiced by the least number of farmers are nursery establishment (8 percent), irrigation (4.5 percent) and mulching (3 percent).

Table 4. 5: Passion fruit production practices

Management Techniques	Number	Percent
Disease control	51	12.8
Pruning	51	12.8
Pest control	50	12.5
Staking	49	12.3
Nutrition	46	11.5
Regular disease scouting	46	11.5
Weed control	44	11
Nursery establishment	32	8
Irrigation	18	4.5
Mulching	12	3

4.2 Passion fruit production information

The findings in this research revealed that majority of the passion fruit farmers relied on other farmers to provide initial information on passion fruit production. This accounts for 62.7 percent as shown in Figure 4.2.
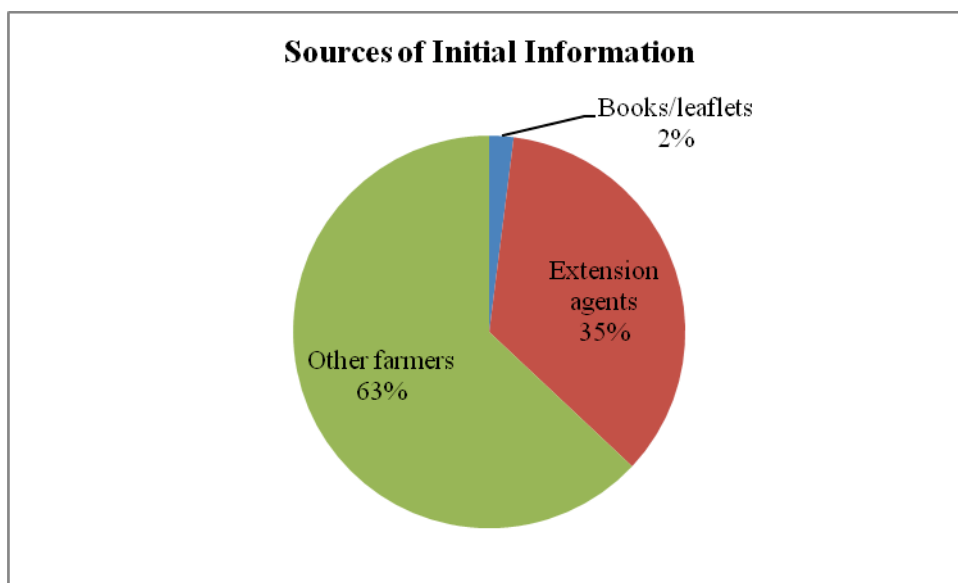
Figure 4. 2: Sources of initial information on passion fruit production

Other farmers as a source of current information accounted for 20 percent while a combination of government extension agents and local NGO agents accounted for 64.9 percent as shown in Figure 4.4.
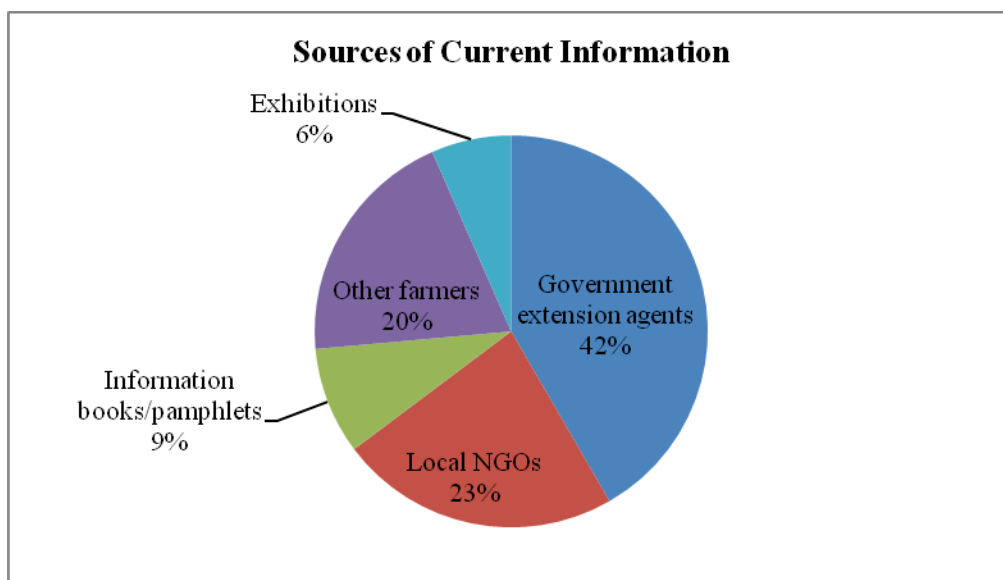

Figure 4. 3: Sources of current information on passion fruit production

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On how frequently passion fruit farmers receive information from extension agents, 40.8 percent of the respondents said they received information weekly while 38.8 received information monthly (Table 4.6).

Table 4. 6: Frequency of receipt of information from extension agents

Time	Frequency	Percent
Weekly	20	40.8
Monthly	19	38.8
Annually	1	2.0
Never	9	18.4

44 percent of the respondents reported that they visited or sought extension agents for information. 28 percent said they never visited extension agents for information.

Table 4. 7: Frequency of visits to extension agents for information

Time	Frequency	Percent
Weekly	13	25.5
Monthly	22	44
Annually	1	2
Never	14	28

As can be seen from Figure 4.5, 8 percent of the respondents said they never consulted fellow farmers. 64% consulted fellow farmers weekly.
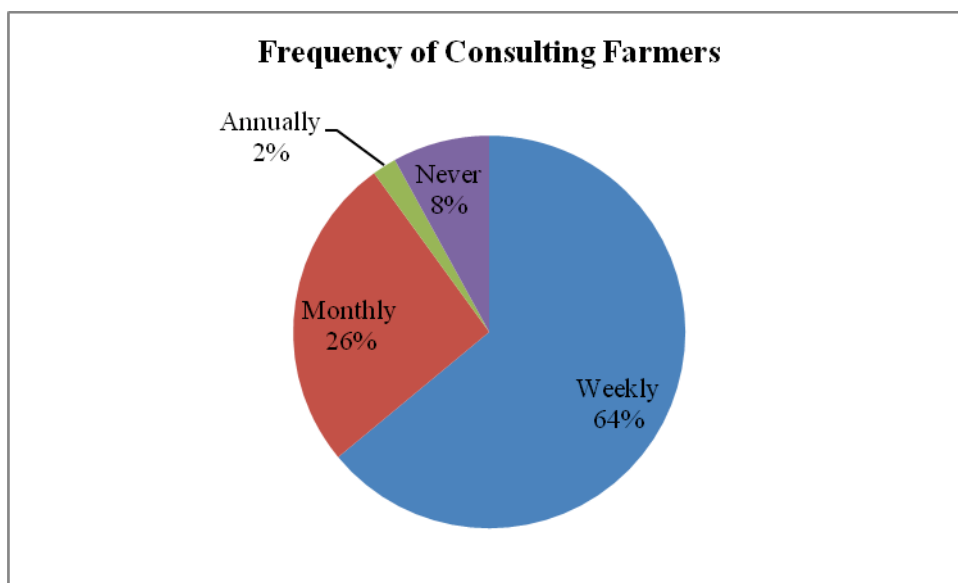
Figure 4. 4: Frequency of consulting fellow farmers for information

Coping strategies used by farmers when they do not get adequate information were: Seeking assistance from books and reading materials (8.7 percent), visit other farmers (21.7 percent) and remove the entire crop and grow it later (52.2 percent). Others, accounting for 8.7 percent said their strategy was to make a follow up with extension agents while 8.7 percent said that their coping strategy was to source clean planting material.

The respondents rated the level of satisfaction of adequacy of information that is availed to them on passion fruit production as satisfied (82.4 percent) and dissatisfied (5.9 percent).

With regard to the rate of satisfaction of the speed of response they got from extension agents they sought information, 86 percent of the respondents were satisfied, 8 percent were neutral and 4 percent were dissatisfied.

4.3 Communication Channels

The table below shows the responses of the farmers on the different channels used by extension agents to communicate information. Farm visits and *baraza*/field days accounting for 29.3 percent each, while radio/T.V was 12.2 percent.

Table 4. 8: Channels of communication used to disseminate passion fruit information

Communication Chanel	Number	Percent
Farm visits	36	29.3
Baraza/field days	36	29.3
Mobile phone	20	16.3
Booklets/leaflets	16	13
Radio/T.V	15	12.2

87.2 percent of the respondents confirmed that extension agents organize farmer group meetings as shown in Figure 4.5.
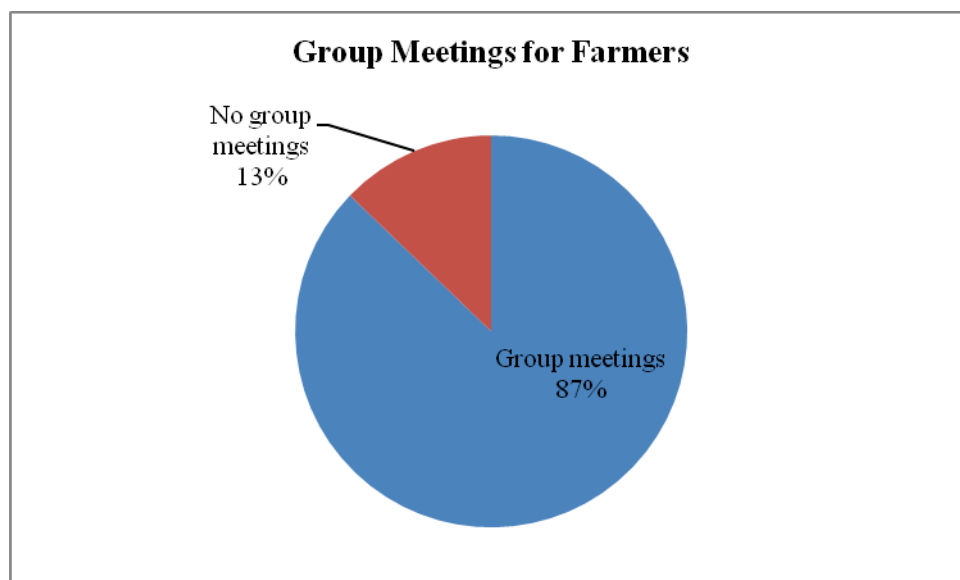
Figure 4. 5: Meetings organised for farmers groups

The frequency of meetings for farmer groups was annually as reported by 54.8 percent of the respondents and monthly as reported by 35.7 percent of the respondents. 4.8 percent said meetings were held weekly and another 4.8 percent said that meetings were never held.

Table 4. 9: Frequency of meetings for farmer groups

Time	Frequency	Percent
Annually	23	54.8
Monthly	15	35.7
Weekly	2	4.8
Never	2	4.8

When asked to rate satisfaction of communication channels, 85 percent were satisfied, 4.6 percent neutral and 10.6 percent were dissatisfied as shown in Figure 4.7.
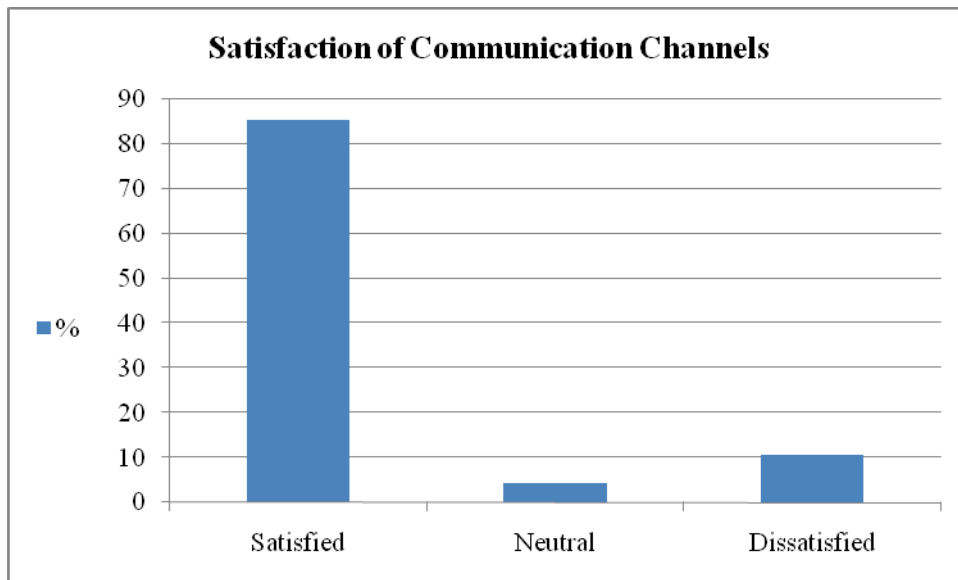
Figure 4. 6: Level of satisfaction with communication channels used

The most preferred mode of communicating information on passion fruit production that should be used by extension agents was *baraza*/field days (29.4 percent), followed by farm visits which (27.5 percent). The least preferred was radio/T.V (10 percent).
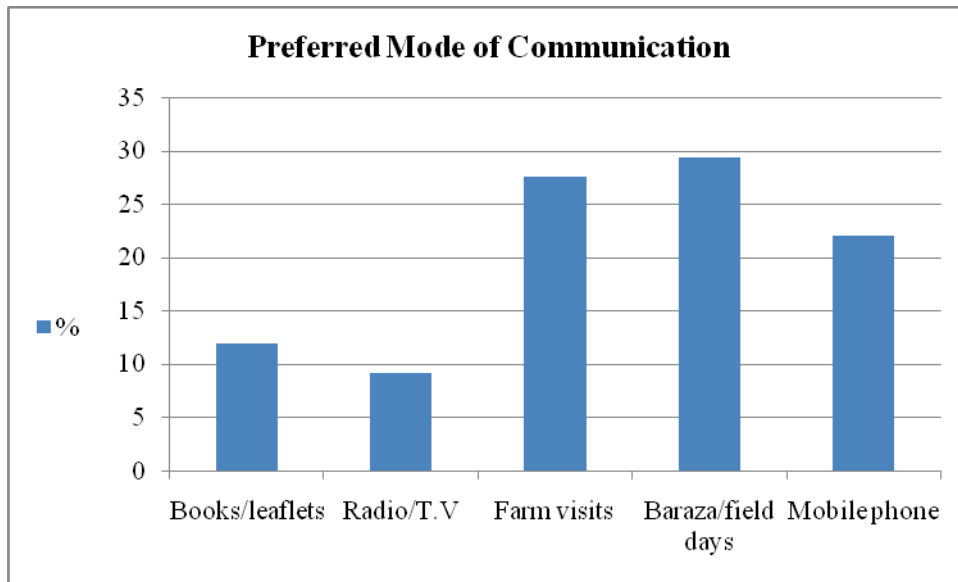
Figure 4. 7: Preferred mode of communication to be used

The respondents who have access to a mobile phone account for 92 percent while 8 percent do not have access to a mobile phone. Only 8.3 percent of the respondents are able to access the internet for information while 91.7 percent do not access the internet. Those who access the internet do so from mobile phones, cyber cafes and own computers as shown in Table 4.10.

Table 4. 10: Access to internet

2 respondents said they use their mobile phones to access internet, 2 use their own computers only 1 access internet at the cyber café.

5.0 DISCUSSION

5.1 Social and economic characteristics of farmers

Majority of the respondents were male passion fruit farmers. There were more farmers who had attained primary level education than those with tertiary education.

The next most common enterprise after passion fruit is maize followed by beans. Dairy farming accounted for only 26 percent showing that crop farming is generally preferred to livestock keeping.

5.2 Management practices

The respondents perform different practices on their passion fruit crop. 32 of all the respondents establish their own nurseries. This is a big number considering that one of the major messages by extension agents is that farmers should obtain clean planting materials from recommended nurseries. Many farmers practice disease and pest control. The methods they use are not very effective since they end up abandoning their crop after a while, precisely when it gets diseased. Most farmers practice pruning, staking (trellising) and pest control which are important aspects of passion fruit farming. Very few farmers practice mulching and irrigation and they only do so when they have young passion fruit seedlings planted during periods of minimal rainfall.

5.3 Passion fruit production information

The findings in this research revealed that majority of the passion fruit farmers relied on other farmers to provide initial information on passion fruit production (62.7 percent). This implies that extension agents did not participate much in the introduction of growing passion fruits

and it was more of the farmers initiative. Based on the earlier observation on their levels of education, very few farmers went out of their way to source information from books.

A difference is noted with sources of current information where other farmers account for only 20 percent while a combination of government extension agents and local NGO agents (64.9 percent). This could be attributed to that extension agents took an interest in passion fruit production after farmers had through their own initiative started growing passion fruit and hence the reason for their being the most relied upon source of information.

Extension agents plan schedules to meet farmers. It is during these occasions that they provide specific information regarding different aspects of passion fruit production. In cases where farmers opt to go to the extension agents for information, 44 percent reported that they visited or sought extension agents for information. 28 percent said they never visited extension agents for information. The concept of demand driven extension has not been well embraced in the study area.

Farmers greatly rely on fellow farmers for information and do not take long before consulting one other.

5.4 Communication Channels

Extension agents use different channels to communicate passion fruit production messages to farmers. Some of the channels available to them are booklets/leaflets, radio/television, farm visits, *baraza*/field days and use of mobile telephone. Majority identified the most used channels as farm visits and *baraza*/field days. The farmers seem to prefer personal contact with extension agents hence the choices they picked.

A question was put to the respondents on whether extension agents organized meetings for farmers groups. This question was to check whether the earlier questions they had answered on access to information from extension agents and also to confirm group meeting as a way of communicating passion fruit production information. Those who answered no to the question do not attend farmer group meetings. It implies that extension agents do not specifically organize farmer group meetings to disseminate passion fruit information but rather take advantage of other meetings to disseminate passion fruit information. Holding farmer group meetings once a year may not be adequate to disseminate pertinent information. Extension agents may need to review how they organize farmers meetings and also improve their frequency or put in place mechanisms to ensure information flow throughout the year.

The respondents who have access to a mobile phone account for 92 percent while only 8 percent do not have access to a mobile phone. If extension agents were to choose communicating through mobile phones, majority of the farmers would be reached as reported by (Aker, 2010) that the use of mobile phones can improve access to information about agricultural technologies by reducing the cost of obtaining this information through other means like paying visits to extension offices.

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusions

This study concludes that farmers appear to be satisfied with information given by extension agents because they do not anticipate the particular type of information to expect, when exactly to expect it because it is at the discretion of the agents. There is no structured follow-up on the technologies farmers are trained on.

Extension agents blame farmers on relying on each other for information yet they have inadequate information or it is not well structured for the farmers to share it among themselves.

The least preferred modes of communication are radio/T. It will be useful to emphasize specific times when agricultural information programmes are broadcasted.

6.2 Recommendations

Both extension agents and farmers should aim at equipping farmers with more structured information since farmers rely on one another for information. The group approach to information dissemination should be emphasised as it was found to be popular with most farmers. It will also be useful in reaching many passion fruit farmers at once.

For more effective dissemination, extension agents should have well planned information sessions and preferably to inform farmers in advance on when the sessions will be held and the technologies to be addressed.

Use of modern communication especially mobile phones should be encouraged to inform on planned training sessions and in future, could be used to access information directly from extension agents through platforms such as SMS.

7.0 REFERENCES

Alavi, M and Leidner, D (2001). Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *MIS Quarterly*, Vol. 25, No. 1 (Mar., 2001), pp. 107-136. http://www.jstor.org/stable/3250961, Accessed: 04/07/2011

Aker, J. C (2011). Dial "A" for Agriculture: Using Information and Communication Technologies for Agricultural Extension in Developing Countries. Tufts University, Economics Department and Fletcher School, Medford, MA 02155.

Arling P.A. and Chun, M.W.S (2011). Facilitating New Knowledge Creation and Obtaining KM Maturity. *Journal of Knowledge Management.* Vol. 15. No. 2

ASDS (2010-2020). Agricultural Sector Development Strategy, Kenya

Bouthillier, F and Shearer, K (2002). Understanding knowledge management and information management: the need for an empirical perspective. *Information Research*, Vol. 8 No. 1 October 2002.

Dalkir, K (2005). Knowledge Management in Theory and Practice. *Elsevier,* Oxford, UK.

Gautam, M (2000). Agricultural Extension: The Kenya Experience. An Impact Evaluation. *The International Bank for Reconstruction and Development/The World Bank.* Washington, D.C. www.worldbank.org/html/oed

Infonet Biovision. Retrieved February 29, 2012 from www.infonet-biovision.org.

Jennex, M. E, S. Smolnik and D. T. Croasdell (2009). Towards a consensus knowledge management success definition. *The journal of information and knowledge*

management systems. Vol. 39 No. 2, 2009. pp. 174-188. Emerald Group Publishing Limited.

Kameswari, V and Gupta, V (2011). ICTS for agricultural extension: A study in the Indian Himalayan region. *The Electronic Journal on Information Systems in Developing Countries*. http://www.ejisdc.org. Accessed on 26 September 2012

Littlejohn, S. W., & Foss, K. A (2011). *Theories of Human Communication, 10th Edition.* Long Grove, IL: Waveland Press

Macharia, D (2007). Passion Fruits in High Demand. The Organic Farmer Nr. 24

Magaji, A (1986). Development of an Effective Agricultural Extension for the delivery of current information to farmers in Nigeria. *Masters Thesis.* University of Maryland Eastern Shore.

Mbatha, C. N. and G.G. Antrobus (2011). Physical, Political and Local Practice Factors as Barriers to Agricultural Development: A Case of the Kat River Valley, South Africa. *The Open Geography Journal, 4,* 91-102.

Ministry of Agriculture (2011). Annual Report

Muyanga M. and T. Jayne (2006). Agricultural Extension in Kenya: Practice and Policy Lessons. Working Paper 26, Egerton University, Tegemeo Institute, Nairobi.

NASEP (2011). National Agricultural Sector Extension Policy Implementation Framework.

Ogboma, M (2010). Access to Agricultural Information by Fish Farmers in Niger Delta Region of Nigeria. *Library Philosophy and Practice (e-journal).* Paper 424. http://digitalcommons.unl.edu/libphilprac/424.

Oladele, O. I (2006). Multilinguality of Farm Broadcast and Agricultural Information Access in Nigeria. *Nordic Journal of African Studies* 15(2): 199–205.

Omolo, A and E. Wanga (Pers. Comm). History of Agricultural Extension in Kenya.

Otipa, M, Ateka E, Mamati E, Miano D, Amata R, Waiganjo M, Wasilwa L, Mureithi J, Erbaugh M, Zhang X and Qui F (2011). Current Status in the passion fruit production systems in Kenya. *JKUAT Scientific Conference*.

Szóstek, A., Markopoulos, P. and Eggen, B (2011). The Dynamic Nature of Availability. *The Ergonomics Open Journal, 4, 28-40.*

Trochim, W. M (2006). The Research Methods Knowledge Base, 2nd Edition. Internet www page, at URL: <http://www.socialresearchmethods.net/kb/> (version current as of October 20, 2006).

Yaghoubi, N., B. Yazdani, N. Ahoorani and S. A. Banihashemi (2011). Information Technology Infrastructures and Knowledge Management: Towards Organizational Excellence. *Computer and Information Science.* Vol. 4, No. 5. www.ccsenet.org/cis. Accessed on 21 September 2011.

APPENDICES

Appendix A 2: Questionnaire

QUESTIONNAIRE

AN EVALUATION OF THE PASSION FRUIT FARMERS ACCESS TO PRODUCTION INFORMATION IN KEIYO NORTH DISTRICT

PART A: SOCIAL ECONOMIC CHARACTERISTICS OF FARMERS (fill or tick as appropriate)

1. Gender   Male ☐   Female ☐

2. Age (Years)   Below 30 ☐   31-60 ☐   61-90 ☐

3. Level of education (highest)   None ☐   Primary ☐   Secondary ☐   Tertiary ☐

4. No. of children   1-3 ☐   4-6 ☐   7-9 ☐   10-12 ☐

5. Farm size (acres)   ☐

6. Farm enterprises (list in order of importance)

Enterprise	Average Acreage of Enterprise	Estimated Annual Income (Ksh)
i.		
ii.		
iii.		
iv.		
v.		

PART B: PASSION FRUIT PRODUCTION (fill or tick as appropriate)

7. For how long have you grown passion fruit commercially? (Years) 0-10 ☐   11-20 ☐   21-30 ☐

8. Which of the following passion fruit management techniques do you apply in your farm?

   i.   Establishment of nurseries ☐   v.   Regular disease scouting ☐

   ii. Disease control ☐   vi.   Mulching ☐

   iii. Pest control ☐   vii. Pruning ☐

   iv. Nutrition ☐   viii. Irrigation ☐

   v.   Staking ☐   ix.   Others (please specify) _____

   _____

PART C: PASSION FRUIT PRODUCTION INFORMATION (tick all relevant options)

9. Before getting started on passion fruit production, where did you obtain initial information?

   Printed booklets, leaflets ☐   Radio/TV ☐   Baraza/Field days ☐   Other farmers ☐
   Others (specify) _____

10. Where do you currently obtain information on passion fruit production?

    i.   Government agriculture extension agents ☐

    ii.   Local NGO/CBO extension agents ☐

    iii. Books/pamphlets ☐

    iv.   Internet ☐

    v.   Others (specify) _____

11. Do extension agents organize demonstrations on passion fruit production for farmers?   Yes ☐   No ☐

If yes, are they easy to follow?   Yes ☐   No ☐

12. How accessible is the information on passion fruit production provided by extension agents?

Difficult ☐   Easy ☐   I Don't know ☐

13. How frequently do you receive extension messages on passion fruit production from extension agents?

Weekly ☐   Monthly ☐   Annually ☐   Never ☐

14. How frequently do you visit extension agents offices for information on passion fruit production?

Weekly ☐   Monthly ☐   Annually ☐   Never ☐

15. What is your coping strategy if you don't get adequate information on passion fruit production?

_____

16. How frequently do you consult fellow farmers for information on passion fruit production?

Weekly ☐   Monthly ☐   Annually ☐   Never ☐

17. Please rate your satisfaction on the **adequacy** of information on passion fruit production that is availed to you

Satisfied ☐   Neutral ☐   Dissatisfied ☐   Don't Know ☐

18. Please rate your satisfaction on the **speed** of response to enquiry for information on passion fruit production

Satisfied ☐   Neutral ☐   Dissatisfied ☐   Don't Know ☐

PART D: COMMUNICATION CHANNELS (tick all relevant options)

19. How is the information on passion fruit production technology communicated?

Booklets/leaflets ☐   Radio/TV ☐   Farm Visits ☐   Baraza/Field days ☐   Telephone ☐
Other (please specify) _____

20. Do extension agents organize meetings for farmer groups?   Yes ☐   No ☐

If yes, how frequently?

Weekly ☐   Monthly ☐   Annually ☐   Never ☐

21. Please rate your satisfaction on the communication channels used to provide information on passion fruit production

Satisfied ☐   Neutral ☐   Dissatisfied ☐   Don't Know ☐

22. How would you prefer to receive information on passion fruit production?

Booklets/leaflets ☐   Radio/TV ☐   Farm Visits ☐   Baraza/Field days ☐   Mobile phone ☐
Other (please specify) _____

23. Do you have access to a mobile phone?   Yes ☐   No ☐

24. Are you able to access the internet for information?   Yes ☐   No ☐
If yes, where?

Mobile phone ☐   Local cyber café ☐   Own computer ☐   Other (specify)_____