Information Dissemination by National Farmers Information Service to Cereal Farmers of Maeni Ward, Kimilili Sub-County, Bungoma County, Kenya

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A Research Project Submitted in Partial Fulfilment of the Requirements for the Award of the Degree Master of Library and Information Science: School of Education, Kenyatta University

November, 2019
DECLARATION

I declare that this research project is my original work and has not been presented in any other university/institution for consideration of any certification. This research project has been complemented by referenced sources duly acknowledged. Where text, data, graphs, pictures or tables have been borrowed from other sources, including the internet, these are specifically accredited and references cited using current APA system and in accordance with anti-plagiarism regulations.

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DEDICATION

I dedicate this work to my loyal family, Forsters, Sheldon, Lucky and Trinah. Without your patience, support and love, the production of this report would truly have been impossible.
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Maeni cereal farmers were very cooperative during data collection. I appreciate all your assistance in making this report a success. My prayer for you is to have a bumper harvest all the years.

NAFIS staff I salute you. Without you, this study would not have been accomplished. May your services be put to the limelight and be embraced by all the communities in the Republic of Kenya.
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<td>ASDS</td>
<td>Agricultural Sector Development Strategy</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>ICT</td>
<td>Information Communication Technology</td>
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<td>KNLS</td>
<td>Kenya National Library Service</td>
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<td>NAFIS</td>
<td>National Farmers Information Service</td>
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<td>NALEP</td>
<td>National Agricultural Programme</td>
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<td>PBO</td>
<td>Kenya Parliamentary Budget Office</td>
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<td>UNESCO</td>
<td>United Nations Educational Scientific and Cultural organization</td>
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The purpose of the study was to find out the impact of information dissemination on cereal farmers activities in Maeni Ward, Kimilili Sub-County Bungoma County in Kenya. The objectives were to find out if cereal farmers were aware of National Farmers Information Service and if they were benefitting from the same. Societies have adopted information as a key factor to achievement of development goals. Information is adding value to productivity. The integration of new technology has made it possible for societies to access any required information cheaply and within a short period of time. Developing countries have not been left out in this era of information society. Such countries are making efforts to ensure there is ease of access to information by providing cheap internet connectivity and electrification in most regions. Agriculture is the main stimulus of Kenya’s economy. However, the growth of agriculture has been on the decline causing food insecurity in the country. Through research conducted by Kenya government, National Farmers Information Service was initiated. The main purpose was to serve farmers’ needs throughout the country including the rural areas, where internet access was linked to enable farmers get critical extension information. A mathematical theory of information communication by Claude proves there are challenges in communicating of information from the source to the intended recipient. The current study used descriptive research design. The sample size consisted of 284 cereal farmers and two NAFIS field officers. Questionnaires, interviews and documentary sources were used to collect data. Reliability and validity of the instruments were tested through a pilot study that was conducted in Navakholo Sub-County that is not factored in the main study report. Data was analyzed and generated via SPSS and presented in form of table.
CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

This chapter covers background to the study, statement of the problem, objectives of the study, research questions, and significance of the study, limitations and delimitations, assumptions, theoretical and conceptual framework.

1.2 Background to the Study

Information is the key to the development of any country, institution, corporate bodies and individuals. According to Umunadi (2014), dissemination of information is the birth of knowledge gain through education and experience. Information is a powerful tool for survival and general development for growth. Information that is well managed can be used for knowledge sharing purposes; it can be used to create room for institutions. The idea of motivating people to make use of the available information requires the message to be customized in order to be relevant to the person in need. In the process, the message is used to capture the attention of the user who may in the end make use of the same message to create change in attitude and behavior towards a certain activity. This empowers decision making process through knowledge gain (Bywood, T., Terao, H., & Roche, A. 2008).

Quality and reliable information is needed by farmers to produce adequate food, meet needs of the people and the entire nation. Information in agricultural sector is used to improve productivity and enhance food security. The World Food Summit of 2017 in summary defines food security as a state where people have access to physical and economic food that meet
consumption demand. According to FAO report 2017, food insecurity is on the rise at an estimated increase from 777 million in 2015 to 815 million in 2016. It has steadily increased thus affecting about 11% of the global population.

To curb on food insecurity, the republic of South Africa government was using technology in information dissemination to increase household food production and hence ensure food security to the nation. This measure has ensured food security in South Africa and governments are headed south for food supplement as experienced 1997 in Kenya (FAO, 2017). According to the World Bank Report (2014), in Africa the local and regional internet service providers such as Zamnet, Sango Net and Internet Africa provide tangible internet services to institutions and individuals in rural and remote areas. The dissemination of internet services to farmers is not a goal itself hence the need to introduce tele centre facilities to enhance information access for community development. Availability to access points of information that are compatible to all people in need is a platform for development growth.

According to the Kenya Food Security Steering Group, 2008, over 60% of the world’s undernourished people live in third world countries. A larger percentage of people who are hungry are in Africa accounting for 33% of the population compared to that of Asia which is 16%. Africa’s food security is even getting worse. The Food and Agriculture Organization (FAO) 2008 report in Africa shows figures of increase in estimates of people who were seriously experiencing hunger from 1990 to 2007. This was presumed to have been due to increased food prices caused by lower production of cereals worldwide caused by lack of proper information.

The report by the Kenya Parliamentary Budget Office (PBO, 2015) postulated that despite enhanced investment in agriculture, the country is yet to achieve food security in most areas that are dry. Consequently, Kenya as a country is struggling to develop agricultural sectors which are...
a key stimulus in vision 2030 strategy on achieving goals on development. It has put in place strategies to improve agricultural productivity through National Farmers Information Service (NAFIS) Programme. NAFIS is a project that was developed by National Agriculture Programme (NALEP) to enable farmers get extension information by browsing on their website and use of cell phones. This was to encourage farmers to make use of technology to enhance farming activities.

Bungoma County’s economy depends on agricultural produce mainly sugarcane and maize. The county has a vast mass of fertile land and has high rainfall throughout the year. This has led to the county having large rivers which can be useful for small scale irrigation. Farmers practice both livestock and crop farming. Cereal farming is the most practiced in Bungoma County. There should be a new development in Bungoma County in which information and its dissemination can be seriously regarded.

Webster (2014) observes that information dissemination was another agenda that had emerged through the use of internet as it became widely available during the 1990s. This focused on the information superhighway and cyber society brought about by new information and communication technology. Information provided is on general and specific agricultural topics. Information is presented in text, graphics, audio and video and it is upon the farmer to select the most appropriate format to access the information.

1.3 Statement of the Problem

Bungoma County is third most populous county in Kenya after Nairobi and Kakamega. It has fertile soils and receives enough rainfall during the year that is suitable for cereal farming. It is the fourth county after Trans-Nzoia, Uasin Gishu and Nakuru counties that Kenya relies on for food security. Kimilili Sub-County borders Mt Elgon that is regarded as highly fertile land.
Maeni ward is in the rural areas of Kimilili, which is peaceful and conducive area for cereal farming. The farmers in the ward practice sorghum, maize, millet farming among other cereals. However, Bungoma County is facing shortage in cereal production. It has been reported that the county relies on the neighbouring country of Uganda for cereals and other food crops for supplements (USAID, 2014). This has caused major food insecurity to the county and the nation as a whole. The task of this study was to find out if the information dissemination service by NAFIS had an impact on cereal farming activities.

1.4 Purpose of the Study

The purpose of this study was to find out the impact of information dissemination by NAFIS had on cereal farmers’ activities of Maeni Ward in Kimilili Sub-County, Bungoma County.

1.5 Objectives of the Study

The general objective of this study was to assess the information dissemination service by NAFIS to cereal farmers in Maeni Ward of Kimilili sub-County towards enhancement of farming activities. The specific objectives were:

1. To find out if cereal farmers were aware of the existence of NAFIS services.

2. To determine the technology preference by Cereal farmers to access NAFIS information.

3. To assess the impact of information dissemination service by NAFIS to the cereal farmers of Maeni ward in Kimilili Sub-County.

4. To identify possible challenges faced in information access by cereal farmers in Maeni, Kimilili Sub-County.
1.6 Research Questions

In order to achieve the objectives of the study, attempts were made to find answers to the following questions:

1. Are cereal farmers of Maeni Ward, Kimilili Sub-County of Bungoma County aware of NAFIS services?
2. What technology do cereal farmers prefer for accessing the information as provided by NAFIS?
3. Does the information provided by NAFIS of impact to the cereal farming activities in Maeni Ward of Kimilili Sub-County?
4. Is NAFIS experiencing any barriers that hinder information dissemination to cereal farmers’ in Maeni Ward of Kimilili Sub-County?

1.7 Significance of the Study

It was hoped that the study findings would help policy makers to come up with decisions and strategies that would enhance the development of information dissemination by NAFIS and achieve food security. More ways to overcome challenges involved in the information services would be achieved and hence the challenges would be minimal. This study would also add value to existing documentary source for future literature review by other researchers and scholars. The study gaps exposed would guide further studies on specific areas for research. This justifies the significance of this study as it would cause major improvement in information service dissemination that enhances development in farming activities.

1.8 Limitations of the Study

These were weaknesses of the study and they were beyond the researcher’s capability to intervene. Some of the limitations were:
1. The questionnaires collected were 80% as some respondents were not able to complete them on time.

2. There was techno-illiteracy amongst some cereal farmers of Maeni Ward.

3. The study area had an impassable network of roads and this interfered with movement in some parts of the study area.

1.9 Delimitations of the Study

The research was narrowed down to information dissemination by NAFIS to cereal farmers in Kimilili Sub-County of Bungoma and not the entire Bungoma County due to the latter’s largeness that would have made it difficult to cover within the study period. The researcher concentrated more on information dissemination and not information creation since the center of interest in the study was on how information was being accessed and used by cereal farmers.

1.10 Assumptions of the Study

The following were the assumptions of the study:

1. The information created by NAFIS was not helping cereal farmers who used it to reap good yields.

2. The access to NAFIS information by cereal farmers of Kimilili Sub-County of Bungoma County was not easy.

1.11 Theoretical Framework

The study adopted mathematical theory on information communication (Claude, 2001). This theory emphasizes on good systems put in place to ensure information created from the source reaches the intended receiver with minimal challenges on noise, accuracy of information and distortion occurring to information during storage. He further says that problems of
communication on selected messages from information source to the destination occur through systems that are designed for a specific purpose without creating room for future system development and this causes barriers that may corrupt messages being delivered.

Good service communication brings satisfaction to customers and it is reflected in their activities. Jiwani (2016) purports that communication policy should be in place and implemented, maintained and sustained by governments and institutions that are tasked to provide information to the public. Information that is well communicated is a distinguishing feature to the world in the sense that economies are developed through information energy. According to Patel (2018), power struggles were decided by a shaped mind which managed the process of information and communication.

Webster (2014) postulates that there was one other suggestion which contend that we had an information communication society, though it had no need to reflect on the meaning of the information so developed. Reviewing these varying definitions of the information communication, what becomes clear is that cereal farmers in their quest for information, needed to reflect on its relevance, accuracy and timeliness so as to achieve high yields or production.

1.12 Conceptual Framework

The establishment of the relationships between dependent and independent variables in the study is shown in figure 1.1
NAFIS to create awareness program

Establish internet linked center for information

Introduction of affordable techno gadgets

Techno training for cereal farmers

Deploy more field staff

Figure 1.1: Sources: Researcher (2019)

Figure 1.1 shows NAFIS dissemination service enhancing cereal farmers’ productivity through use of knowledge gained in accessibility to information and hence good food security to cereal farmers in the region of study which leads to improved livelihood to the region. The dependent variable which in this case is NAFIS dissemination service is being hampered by many challenges which include: inaccessibility to information, under-utilization of information,
Figure 1.1: Sources: Researcher (2019)

Figure 1.1 shows NAFIS dissemination service enhancing cereal farmers’ productivity through use of knowledge gained in accessibility to information and hence good food security to cereal farmers in the region of study which leads to improved livelihood to the region. The dependent
inadequate techno storage facilities, lack of awareness of NAFIS existence by cereal farmers, and techno-illiteracy among some cereal farmers. These challenges are the determinant of independent variables.

Independent variables are: access to NAFIS information, techno-storage facilities, techno-illiteracy in cereal farmers and awareness of NAFIS services by cereal farmers. These independent variables can be minimized through possible interventions put in place in order to curb on challenges which are the major barrier to information dissemination services provided by NAFIS to cereal farmers in Kimilili Sub-County of Bungoma County.
1.13 OPERATIONAL DEFINITION OF TERMS

Cereal: Grains that can be made into flour or plants that produces grains

Communication: The process of giving information or system of sending information.

Dissemination: A way of conveying, distributing or giving out information to intended audience or clients.

Farmer: A person who owns or manages a farm

Information: Processed data which gives advice, briefing, input, instructions that are relied on for operations or livelihood

Information revolution: A state where the perception on information drastically changes to a better status. Information is highly valued and demand for it rises.

Information society: A state where information is highly regarded in all walks of life. Society depend on information for decision making and improvement.

Dissemination: The act of providing something that someone needs.
CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter is a review of what other people had written on information access and use by farmers. The sections of the chapter cover the importance of information in farming activities, technologies NAFIS used in dissemination of information to cereal farmers, cereal farmers’ awareness of existence of NAFIS, relevance of information provided by NAFIS, and Possible challenges faced by cereals farmers in accessing the information provided by NAFIS.

2.2 Importance of Information in Farming Activities

Information is regarded as the backbone to farming activities which are an economic pillar to a country. According to DAFF (2011) report in South Africa, it is emphasized the salient role of agriculture was to encourage citizens do more of farming and hence reduce food insecurity. This could only be realized when the information being disseminated was up to date and easily accessible by farmers. Institutions that provide this service had to develop a system that is compatible with minimal changes and maintain its stability in any environment. The means and ways of communicating information is what matters most.

Information service depends mostly on the clients, their information demand characteristics, their activeness, curiosity and expectations. Information aids in decision making, helps in change of attitude in people and generates new information (Library & Information science community, 2014). Information should be easily accessed by all people regardless of their status. Campaigns
geared towards promoting access to information need to be conducted at all levels to ensure more people access information of their need (ANCL, 2011).

Farming activities more or less depend on information for thriving. In these activities, information is very vital to enhance productivity which can help curb the food insecurity menace. Konstant and Taylor (2008) observes that perception about information and decisions on how to use was determined by whether our lives were run by information or whether we were in control. Information is a catalyst to farming activities that increases productivity.

UN 2030 SDG’s goal 2 objectives, was to find ways of achieving food security that will help improve on production and promote sustainable agriculture through information dissemination. The main aim of all these endeavors was to end hunger in Africa. In sustainable agriculture, UN intended to double the agricultural productivity by ensuring there was secure and equal access to land through knowledge, inputs, finance, markets and gained opportunities in value addition. It was prospected that by 2020, there will be a good maintenance of genetic diversity of seeds with soundly managed diversified seed and plant banks at national, regional and international levels that will promote higher production.

According to FAO (2017), the Government of Iran under the Ministry of Agriculture, Plan and Program Department, highly regards information as an important factor that provides development to farming productivity. This development is mostly dependent on the vast knowledge researched by extension workers. This knowledge includes information on best farming activities, tools to be used and the state of the soil (Cunliffe, 2008). The use of
information in Iran has changed the way farming activities are practiced and it has increased food production in the country. Food insecurity is no longer experienced in Iran.

The Government of Kenya more or less like the Government of Iran recognizes information as a resource which can be preserved for national prosperity (ICT, 2016). Information can strengthen and secure the position of both those at work as well as those at home. Information allows families, institutions and individuals to plan for their lives and lead to independent wealth. Information activities are vital and consequently, the mode of dissemination is a priority. More attention given to cereal farming through information dissemination is a pillar to food security in the country.

Information technology can be viewed as a direct tool that contributes to agricultural productivity and also as an indirect tool that empowers farmers to get access to information and hence be able to make decisions in the right way of farming activities (Cunliffe, 2008). Information access through technology enables a wide population of cereal farmers to utilize the same. Claude’s theory clearly states that information created should be compatible in systems that are in place to deliver intended message to the receiver without changing or distorting the same information. Technologies should adopt Claude’s theory in information communication.

2.3 Maeni Ward Cereal Farmers’ Awareness of Existence of NAFIS

Awareness involves strategy, business/company logo and perception of a customer as posited by Bentley, Paul et al... (2012). The process of creating awareness determines how the public sees a product and the impact it has on the usage or consumption of the same. Agriculture needs farmers to be successful in productivity and all means to attract and persuade them to make use of services provided is essential. This can be done through marketing and promotional activities
It is the role of NAFIS to create awareness of their services to cereal farmers of Maeni Ward in Kimilili Sub-County of Bungoma County.

Advocacy does not only depend on money but the consistence of the effort and a well stated message. On matters concerning the quality of promotion, Wolinski and Coates (2005) observes that, there was a chance element in any promotional campaign. Some campaigns had failed because they were not cost effective. Institutions mandated to disseminate information have a duty to ensure they have a cost effective program in awareness. The services offered should clearly be stipulated so as to give detailed information on what to cover and what to omit.

According to Hermes (2014), information professionals need to advocate for the benefits of the information societies and knowledge societies in order to sensitize the public. For clear and good sustainability goals achievement, the support of employees in engagement of creating awareness is essential. Meek et al... (2007) observes that a market orientation is an organization in depth of understanding their product, how to distribute and having a wide knowledge on consumer needs. The needs of customers should be addressed in marketing program and staff tasked with this duty should have vast knowledge on how to go about it. Piercy (2002) acknowledges that the process of going to market was not easy and required substantial change in the way organizations were run and that a key role of marketing was to encourage and facilitate change so that employees are more likely to accept and embrace it willingly.

In the year 2017, the Nigerian Government had a program in place to ensure there was access to information by farmers. Strong information networks had been developed and sensitization of the same was done by field workers. It was the duty of field workers to ensure that farmers accessed the information available. This arrangement really improved on the food security of the
country (USAID, 2017). The country has a surplus in food and hence curbed on the food insecurity that was being experienced before information was availed to farmers.

Kenya National Library Service (KNLS) is doing much to try and bridge the gap in the digital divide by subscribing to NAFIS databases and availing the information to their users at no extra cost www.knls.ac.ke. This was really assisting farmers in general although the KNLS network of libraries was not all over the country. KNLS services were currently based in urban areas although there are measures to ensure that they reach communities in rural areas. Kumar (2004) points out that, information professionals need to market their services to remain connected with their communities and have some bearing on real world issues and present day events. Marketing promotes an updated image, increases visibility, ensures survival and helps maintain relevance.

NAFIS is doing little on publicity through agricultural shows, field days, stakeholders’ meetings which did not create any impact as this approach was only best for those farmers who had knowledge of such activities (www.nafis.go.ke). This caused a lapse in the information delivery due to inadequacy in awareness program. Drummond, Ensor & Ashford (2001) posits that in circumstances where customers lack knowledge of a new product or service, the likelihood of consumption is nil. This was the reason the researcher went out to the field to find out a suitable way forward on the best practices on creating awareness and the relevance of the same to the farmers.

2.4 Technologies Preference by Cereal Farmers to Access NAFIS Information

Technology development was another investment that was upcoming and this had a hand in enhancement of agricultural productivity. Goal 9 of the 2030 SDG’s was to strive to enhance scientific research and upgrade technology. More research on agricultural production and
embracing technology and innovation in the agriculture sector was to be encouraged. Knowledge gained through research and technology research was to be shared in order to promote new development. Knowledge dissemination was seen as vital by use of information and communication technology.

The development in information growth in the society was being driven by technology advancement and its application. This had changed the way information was retrieved, accessed and used in organizations and institutions. Farming activities depended on information for better production. Communication of such information relied on systems with good designs suitable to deliver quick and accurate information. Technology gadgets in use to access of such information have to be customer friendly in cost, compatibility, and durability and easy to operate. Technology being a new aspect to cereal farmers, basic training was needed to enable ease on usage of the techno gadgets. Most rural areas had remote chances of leveraging these technologies (Zimmermann, 2016).

Information technology can be used to determine the weather, seeds for planting, planting methods, application of fertilizers and pesticides, and the right time of harvesting (Zappa, 2014). According to FAO (2019), Cereal farmers needed to be encouraged to embrace use of technology in their farming activities as more information was relayed on this platform. Government institutions in their efforts to empower cereal farming activities need to invest more in technology. In 2030 SDG’s report, more investment in agriculture was prospected of which its main aim was to enhance international cooperation in rural infrastructure that was to boost agricultural research and extension services through technology development.

Basing on report by Outa, Etta & Aligula (2006), rural areas still had problems on ICT hardware caused by limitations in technology despite laptops being an option. Sources of power and its
installation posts another barrier to use of hardware’s to access information. Although networks were an integral part of persuasive connectivity, the cost of owning bandwidth in Kenya and other developing nations was still prohibitive. NAFIS availed the information and it was upon the cereal farmer’s efforts to access and use it.

According to Walls (2009), the development in internet had brought about a new environment in information delivery and access. The world had moved into a global village in furthering the advent of low cost computer and easy—to-use word processing software. World Bank Report (2007), on connectivity spells that mobile gadget was fast growing in the world and Africa had undergone a communication revolution. Mobile telephones were owned by the rich and the poor, in the cities and villages and they had become basic means of communication.

Lack of standardized techno information gadgets, high cost and unreliable Telecommunications, posed danger to purchasing of techno gadgets to enable information access (ICT, 2016). This report exposes the gap in digital divide between rural areas and urban areas which contributes more to information access and use. This digital divide has subsequently affected some of the cereal farmers. It is also evident in the report that there is inadequate and competent skilled human resource in ICT.

Singapore had few natural resources and imported most of their food from neighboring countries and this was similar to Kenya. By 1970, Singapore realized that it could not compete in the labor intensive industries. It therefore decided to focus on capital and IT intensive activities whose main resources were information and knowledge (Hioe, 2001). This has improved on information dissemination services and a boost to agriculture sector which has achieved good
yields. Food security in Singapore has been sustained through investing in technology and information.

The Kenya Government as well as Singapore is investing in digital technology. Ministry of Information and Communication in Kenya has a policy in place that spells out strategies to be put in place so as to keep pace with dramatic changes in technology, to improve on the broadband connectivity and to foster competition and innovation in the sector (ICT, 2016). KASNEB News lines (2013), observes that mobile telephone operations running on unsecured internet experienced vulnerability to hackers than switched voice network. This experience is a threat to internet users. However, statistics from Kenya, Ministry of Information Communication and Technology post an increase in internet usage by 45.4% in the year 2015 of which mobile telephone subscribers were having an upper hand (ICT, 2016). This report further shows a decrease in the cost of mobile telephone call charges from Ksh. 3.10 in the year 2014 to Ksh.3.08 in 2015 although SMS charges went up from Ksh.1.00 to Ksh.1.25 the same period. The cereal farmers’ dependency on mobile telephones to access information tended to be somehow cumbersome.

The information provided by NAFIS was organized, arranged and disseminated to users on the web. Farmers were expected to log on the web or make use of their cellphones to access the information of their need. The system was innovative and it gave out a voice/web information service that was updated through web by field extension officers. Farmers were given this cellphone number 0205008890 to call for more information. The system used English and Kiswahili in communication and it did not incur extra charges on normal telephone rates.

The researcher purposed to find out the most appropriate technology cereals farmers could use in accessing information from NAFIS.
The management of information is an important and necessary activity in organizations and institutions that depend on it for development. The impact on information is measured through its accuracy, relevance, access and use. Timely information collection and its proper dissemination bridge the gap between food production and consumption. Makori (2012), argues that information service dissemination on digital platforms has brought changes to how information is created, stored, distributed, accessed and delivered to final destination. The information should address clients' information demand, characteristics, their activeness, curiosity and expectations. The said information must be relevant to articulate the need so as to succeed.

The growth in the amount of information then available and the wide variety of formats, size and the rate of technological change contributed more to reliability and relevance of information dissemination, Wachira, Muggah & Munene (2005). The effects of information overflow generate anxiety and poor attention that brings along poor decision making. This affects the day to day development of people who depend on information for growth. According to Soto-Acosta (2014), some information given is of a wide range sources of information which has advantages and disadvantages. He further stated that in some situations, this information is probably generated by government institutions and include maps and statistics data, which were not up-to-date, on agricultural activities. Quite often, such information was regionally oriented and not specific enough for local projects. Due to information explosion, information available on the net was not suitable for certain activities in particular areas. Information available should be able to educate, guide, instruct, brief on the current needs of farmers. The content should be specific to the point.
Outa, Etta & Aligula (2006), observes that the content part was concerned primarily with availability and accessibility of relevant materials. Such content was defined by nature and scope of these activities. Access to appropriate information and knowledge was an overriding factor for successful agricultural production and rural development. However, the traditional approach of providing agricultural information through extension services was overstretched and under-resourced (Ashraf, Gine and Karland 2005). These circumstances posed notable challenges to information dissemination and access.

2.6 Possible Challenges to Information Dissemination by NAFIS to Cereal Farmers in Maeni Ward

Challenges cause barriers to ease of access and utilization of information. Ocholla and Ojiambo (2000), posts that, information service was a unit or system, designed and organized to provide information to users. This is a system that should have minimal challenges in order to serve its purpose and achieve the objectives. The accessibility and usage of the information provided by NAFIS depends mostly on the availability of the internet, technology gadgets like computers, smart phones and power. These entire techno infrastructures relied more on funds in order to acquire. The poverty rate in Bungoma County which stands at 52.9% (USAID Kenya; 2014) posed a great challenge to farmers in accessing and utilizing information.

The literacy level in Bungoma County which stands at 60.5% (USAID Kenya, 2014), was a pillar that could contribute positively to information access. However, most farmers lacked knowledge in how to operate techno facilities for access to information. An increase in information access improves development planning, supports agricultural marketing and enlightens farmers on good or sound natural resources management practices.
UNESCO (2000), points out that information has become an essential basis for the progress and civilization of society and lack of it leads to limiting factors that contribute to the economic and social development of people. Walls (2009) supports the argument that many of the problems facing agricultural extension in developing countries arose from the lack of a single direct line of technical support and administrative control for field level staff. Very often, the extension worker was loaded with non-agricultural work.

Policy makers around the globe were putting in place statutes designed to foster knowledge-based activity. One of the investments was in telecommunications systems and bandwidth, where information was viewed as a resource for improving commercial and industrial competitiveness and productivity (Grantham and Tsekouras, 2004).

Illiteracy is referred to as the inability to read, write and skills to access knowledge through technology and complex contents (USAID, 2014). Techno-illiteracy among farmers was a major challenge to information service access and utilization. Access to information becomes a challenge due to inability by farmers to operate the techno-gadgets. Techno gadgets tended to be expensive in acquiring and farmers prioritized their needs. Mass volume of information on the techno gadgets has also played a role in under-utilization of NAFIS information, since the confusion in selecting the rightful information is a challenge. Morgan (2006), argues that computers automated complex information flows and with the development of the internet, corporate intranets and other webs of electronic communication which cause difficulty in information selection. This study tended to pin pointed out the possible challenges that were faced by both NAFIS staff and cereal farmers in dissemination of information.
2.7 Summary and Gaps in Literature Review

Much literature has been written on the importance of information to governments, institutions and individuals on how they depend on information. Agriculture more or less depends much on information for food production. Food security is being enhanced through information dissemination that is timely, accurate and easily accessed. Information flows in different formats through internet and this has changed its delivery.

In the literature review, gaps are shown in the information storage, retrieval and access. Information is of no use if it has no proper storage facilities, means of retrieval and access points that are known well by the end user.

Awareness of a product or service to the intended customers is essential. The more people know of such service or product the more they will be associated with it. There are various ways of conducting awareness program that have been mentioned. However, field practicals are a more efficient way of sensitization to the public. This has not been covered in the literature review.

Technology had been embraced in the farming activities and especially by cereal farmers. Information was accessed more on digital platforms. Governments were doing much through investing in technology as they realized the impact it had on agricultural development growth. Technology gadgets connected with internet provided more access to information. The need to have techno infrastructure in rural areas was considered a priority by institutions and government. Basic training on use of techno gadgets becomes essential. This is a major gap as cereal farmers are expected to log onto NAFIS web to access information but no instructions on how to go about it is given.
NAFIS field staff as evidenced in the study are two. The population of cereal farmers as compared to the field staff is not proportional. This creates a gap in the information dissemination as most farmers relied on field staff due to inadequate techno infrastructure in rural areas.

In summary the gaps in the literature reviewed are information storage, information retrieval, information access, field practicals to cereal farmers, basic techno training to cereal farmers and NAFIS field staffing.
CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter discusses research design, variables, research methodology, location of the study, target population, sampling techniques, sample size, research instruments, pre-testing, validity, reliability, data collection techniques, data analysis, logistical and ethical considerations.

3.2 Research Design and Locale

This study adopted a descriptive research design which accurately gave a good description of the population of Maeni ward in Kimilili Sub-County. Qualitative and quantitative methods were used to manipulate data collected from questionnaires and interview. The design was suitable for this study as it described data and characteristics such as behavior, attitudes, opinions and habits of cereal farmers. The use of statistics was accommodated by the design and calculations were done in frequencies and averages that gave out an accurate understanding of population characteristics and events of Maeni Ward.

3.2.1 Variables

The study had both dependent and independent variables. The dependent variable in this study was NAFIS service dissemination and the independent variables included lack of awareness in cereal farmers, inadequate techno infrastructure, inadequate field staff and techno illiteracy in cereal farmers.
3.2.2 Study Locale
The study was carried out in Maeni Ward of Kimilili Sub-County in Bungoma County which has limited cases of landlessness that has come out as a result of strong family and community ties that regulate land use. The county experiences peaceful environment, high rainfalls throughout the year and it also has a vast land mass that is fertile. Kimilili is in the upper midland zone of Bungoma County, neighboring Mt. Elgon that has highly fertile lands. Maeni ward being a rural ward in Kimilili, stands out to be suitable area for farming and this is why it was selected for the current study.

3.3 Target Population
The population of Maeni ward was approximately 24,209 (KNBS and SID; 2012) which consisted of 1,500 households. The selected target population size was 1,500 household of farmers practicing cereal farming in Kimilili Sub-County and two NAFIS field officers from the area under study. The cereal farmers’ household representatives provided information that was needed in the study through questionnaires while NAFIS field staff participated in a scheduled interview.

3.4 Sampling Techniques
The sampling technique employed was stratified simple random for cereal farmers and purposive random for two Participants from NAFIS field officers. This study with guidance by Cohen, Manion & Keith (2003), worked with a sample of 286 which consisted of 284 households of cereal farmers of Maeni Ward and two NAFIS field workers of Kimilili Sub-County.

3.5 Sample Size Determination
Using a simplified formula for sample size determination taking the population size of farmers to be 1000.
Where \( n \) is the sample size, \( N \) is the population size, and \( e \) is the level of precision (0.05). When this formula is applied.

\[
\frac{n}{N} = \frac{1}{1+N(e)^2}
\]

\[
= \frac{1000}{1+1000(0.05)^2}
\]

\[
= 286
\]

Out of this number, 284 were cereal farmers and two were NAFIS staff.

### 3.6 Research Instruments

The instruments used in data collection were questionnaire, interview schedule and documentary sources. The main research tool was questionnaire for farmers. This had both close ended and open ended questions.

### 3.7 Piloting

Piloting of the data collection instruments was conducted in Navakholo Sub-County in Kakamega County. The pilot study covered 50 cereal farmers from the area. This was to ensure validity and reliability of the instruments. The findings from the pilot study were not included in the study.

#### 3.7.1 Validity

Validity is a functionality of accuracy in a study. It is the degree to which findings obtained from data analysis represent the activities under study (Sindhu, 2011). Respondents were selected for this study in order to minimize on working with a large population which is prone to errors and time consuming. The content validity of the instruments was tested to ensure appropriate vocabulary and sentence structure was used in questionnaires for good understanding by
respondents. This was done with help of friends who volunteered to do piloting of the data collection instruments. After the piloting, the instruments were reviewed and evaluated to enhance validity.

3.7.2 Reliability
To ensure reliability of data collection instruments, internal consistency of data was determined from the questionnaires. The score obtained in one item was correlated with scores obtained in other items in the questionnaires. The measure was preferred to other measures of reliability since it yielded consistent results after trials (Mugenda, 2014). The test retest technique was employed in the study to assess the reliability of the instruments.

3.8 Data Collection
The researcher was permitted by the Kenyatta University graduate school to conduct the study. Authority from the local government of Kimilili Su-County was sought and granted. Participants were informed on the purpose and nature of the study. Confidentiality and anonymity of participants was safeguarded and respondents were given an option in participation. Data collected was only used for the study purpose. Legal and ethical issues were maintained during the study period by ensuring confidentiality and anonymity of respondents’ was concealed.

Questionnaires to farmers were administered by the researcher and collected back through assistance from local administrators. Interviews on NAFIS extension officers were scheduled and conducted by the researcher. Secondary data was collected through documentary sources including books.

3.9 Data Analysis
The collected data through use of questionnaire and interview was edited to ensure consistency and completeness. The findings of the study were analyzed qualitatively and quantitatively. This
enabled the researcher to come up with summarized data including percentages and ordinal numbers. The method was considered suitable for this study as questionnaires and interview were tools used in data collection and they are easily analyzed. Data was then presented in form of tables. Simple correlation analysis was used to determine the impact of NAFIS on cereal farmers’ activities in Maeni of Kimilili Sub-county of Bungoma County.
CHAPTER FOUR

PRESENTATION OF FINDINGS, INTERPRETATION AND DISCUSSION

4.1. Introduction

This chapter presents findings, interpretations and discussions according to objectives, research question in relation with literature reviewed. The objectives of this study were: to find out if cereal farmers were aware of the existence of NAFIS services; to establish the most preferred technology by cereal farmers to access NAFIS information; to access the impact of NAFIS information dissemination on cereal farming activities, and to identify possible challenges faced in information dissemination by cereal farmers in Maeni, Kimilili Sub-County.

4.2 General Information

Out of a sample size of 286, respondents were 229 of which 227 were cereal farmers and two were NAFIS staff. The different types of cereal farming activities by different individuals culminated into forming of strata to enable accurate findings. Three strata were formed which included maize farming strata, sorghum farming strata and millet farming strata. Maize farming strata had 202 participants, sorghum strata 36 participants and millet strata 85 participants. All these strata were analysed into common general findings.

Cereal farmers who had attained secondary level of education were 68, college level 46, university level 20 and primary level 91. Active cereal farmers fall under the age bracket of 26 and 55yrs. Female members of the area were the most involved in cereal farming while their male counterparts searched for menial and lucrative jobs in urban areas. Female participants were 132 while male posted 95 in cereal farming.
4.3 Response Rate

In this study, 284 questionnaires were distributed to cereals farmers of Maeni Ward in Kimilili Sub-County. Out of the 284 questionnaires, 227 which represent 80% of the total number given were completed and collected. Some of the farmers had travelled away from home and others had misplaced the questionnaires. However, there arose a challenge in language barrier due to some farmers being conversant with Bukusu dialect only. This was a challenge in filling of the questionnaires.

Two of the NAFIS staff were interviewed and the result, were coded in SPSS and reported separately according to their responses.

4.4 Demographic Data

4.4.1 Age of the farmers

Age is a factor that helps to determine the group that is more active in a particular activity. This also helps in future studies that might be conducted. Data collected here was helpful to the study in coming up with findings. Respondents were therefore asked to indicate their age group and their responses were as indicated in Table 4.1.
Table 4.1: Age of the Farmers

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25 years</td>
<td>44</td>
<td>19.3</td>
</tr>
<tr>
<td>26 - 45 years</td>
<td>104</td>
<td>46</td>
</tr>
<tr>
<td>46 - 55 years</td>
<td>73</td>
<td>32</td>
</tr>
<tr>
<td>&gt;56 years</td>
<td>6</td>
<td>2.7</td>
</tr>
<tr>
<td>Total</td>
<td>227</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

From Table 4.1 responses, the study reveals that the majority of cereal farmers accounting for 46% were between the ages of 26 and 45 years. This could be due to members of the group being energetic and able to take decisions on their own. In most cases, people over the age of 56 years are old and less energetic, while those below 25 years are generally in academic institutions ranging from ECD to universities. Age is therefore a determining factor for successful farming activities. According to Guo, Wen & Zhu (2015), age of farmers affects farming output. It is believed that older farmers are less productive than younger farmers. The adoption of technology in farming activities is also being guided by age. Technology in third world countries, being a new concept, has mostly been adopted by young generation of people.

4.4.2 Gender of the respondents

Respondents were asked to indicate their gender by simply ticking in required boxes given in the questionnaires. Table 4.2 gives the findings.
Table 4.2: Gender of the Respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>95</td>
<td>42</td>
</tr>
<tr>
<td>Female</td>
<td>132</td>
<td>58</td>
</tr>
<tr>
<td>Total</td>
<td>227</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

From responses in Table 4.2, it is clear that farming activities in Maeni Ward are being undertaken by more women than men. It can be presumed that generally most men relocate to urban centers in search of menial and white color jobs while their female counterparts are left in villages to tend to farming activities and general up keep of homesteads. Kenya National Bureau of Statistics (2018), reports that female people are more than male counterparts. This is another reason why women outnumbered male in farming activities.

4.4.3 Level of education of the respondents

Education being a key to development of individuals, organisations and institutions, the level of education in cereal farmers also matters when it comes to understanding of certain concepts. NAFIS relays its information on different platforms, for example on their website. It is upon the users to access this information and utilize it on their own. With lack of education, this could not be possible. Respondents were therefore asked to indicate their level of education and their responses were as presented in Table 4.3.
Table 4.3: Level of Education of the respondents

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>91</td>
<td>40</td>
</tr>
<tr>
<td>Secondary</td>
<td>68</td>
<td>30</td>
</tr>
<tr>
<td>College</td>
<td>46</td>
<td>20.3</td>
</tr>
<tr>
<td>University</td>
<td>20</td>
<td>8.7</td>
</tr>
<tr>
<td>No response</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>227</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

From responses shown in Table 4.3, it is evident that majority of cereal farmers had attained formal education. Literacy plays a major positive role in cereal farming activities. It enables good understanding of the information by cereal farmers as well as utilization of the same. According to King (2011), education is fundamental development and growth to farming activities.

4.5 Importance of NAFIS Information

The researcher sought to establish the importance of information provided by NAFIS to cereal farmers. The farmers’ responses were as shown in Table 4.4.
Table 4.4: Importance of NAFIS Information

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Harvest</td>
<td>204</td>
<td>90</td>
</tr>
<tr>
<td>Knowledge</td>
<td>170</td>
<td>75</td>
</tr>
<tr>
<td>Empowerment</td>
<td>69</td>
<td>30.3</td>
</tr>
<tr>
<td>Networking</td>
<td>77</td>
<td>34</td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

Table 4.5 points out that information enabled good harvest to 90% of cereal farmers. According to UNESCO (2000), information is very essential to development and growth and this was evident from the findings of this study. Knowledge gained through use of relevant information had to some extent empowered cereal farmers in farming practices. However, empowerment among farmers was very minimal. According to Walls (2009), information that is well processed, stored and exchanged in volumes of data gives room for strategies that are developed for successful growth.

4.6 Technologies in Use by Cereal Farmers

This was one of the main objectives of this study that was meant to establish the type of technologies preferred by cereal farmers. The researcher therefore asked farmers questions that would enable understand the depth of exposure in technology development and growth.

Sections 4.6.1 and 4.6.2 give more details on the findings.
4.6.1 Type of phones used by the farmers

NAFIS had given out cellphone numbers to farmers to make calls in such of additional information. To determine the type of mobile phones in use by cereal farmers to access information, respondents were asked to tick in the appropriate box indicating the kinds of phones they used. Their responses were as presented in Table 4.5.

Table 4.5: Type of Phones Used by Farmers

<table>
<thead>
<tr>
<th>Types of Telephones</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>With no internet Access</td>
<td>135</td>
<td>59.3</td>
</tr>
<tr>
<td>With internet Access</td>
<td>92</td>
<td>40.7</td>
</tr>
<tr>
<td>Total</td>
<td>227</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

From the findings in Table 4.5, it is clear that 59.3% of cereal farmers lacked techno gadgets with internet connectivity. This is very alarming since farmers can only access NAFIS website through internet connection. With the current advanced digital technology worldwide, good techno gadgets are required to access information. The gadgets should be compatible; internet connected and have enough storage capacity. ICT (2016), reports that there was an increase in internet usage which posted 45.4 percent. However this does not apply to cereal farmers in Maeni Ward.

4.6.2 Computer usage by cereal farmers

Computers are other platforms for accessing NAFIS information. Farmers therefore require basic knowledge of computer operation. People with no basic knowledge on how to operate computers
are challenged on how to access information through the platform. The researcher wanted to know if cereal farmers were using computers which would be an indication of having basic computer knowledge. The findings of the study are stipulated in Table 4.6.

Table 4.6: Computer Usage by Cereal Farmers

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>57</td>
<td>25</td>
</tr>
<tr>
<td>No</td>
<td>170</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td>227</td>
<td>100</td>
</tr>
</tbody>
</table>

**Source:** Researcher (2019)

The findings as given in Table 4.6 give an impression that individuals were striving to invest in technology development. According to Riggs (2005), technology had brought changes in the development in internet and given birth to a new environment in information delivery and access. Computer knowledge was an added entity to technology development. However, the cereal farmers in Maeni Ward had 25% of cereal farmers with computer literacy. This might be one of the contributing factors that hindered the access to NAFIS information. Governments and institutions are investing much in farming sectors through technology development and it is essential to train cereal farmers on basic ICT knowledge.

### 4.7 Farmers’ Awareness of Existence of NAFIS

Awareness of the existence of a commodity or service boosts the usage of the same. A population that is not aware of anything is like a population that does not exist in relation to the activity being done. It is paramount for institutions or individuals to create awareness of the products/
services being rendered so as to attract the attention of consumers. Cereal farmers were therefore asked if they were aware of NAFIS existence. The findings are stipulated in Table 4.7.

Table 4.7: Awareness of Farmers About NAFIS Existence

<table>
<thead>
<tr>
<th>Awareness</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>79</td>
<td>35</td>
</tr>
<tr>
<td>No</td>
<td>148</td>
<td>65</td>
</tr>
<tr>
<td>Total</td>
<td>227</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

From Table 4.7, the findings show lack of awareness was one of the factors that hindered information access by farmers. 65% of cereal farmers were not aware of information that was being provided by NAFIS. According to Luoma, CAE & Barnbee (2017), it is upon institutions that offer services to the public to create awareness of the same for public consumption. Meek, H., Meek, R. & Parkinson (2007) observe that a market orientation is an organization in depth of understanding what they have, understand the needs of their clients and work on possible ways on how to avail the product/service on demand. NAFIS should consider this observation and put in place measures to attract more clients.

4.8 Impact of NAFIS Information to Cereal Farmers

Impact of information can be measured through its relevance, access and usage. The relevance of information is determined through services offered by NAFIS. Utilization of the same information relates to the relevance of the same information, relevance, access and utilization complements each other and thus cause an impact to information.
4.8.1 Types of services offered by NAFIS to the farmers

Respondents were given a variety of choices of types of services offered to tick against. The purpose was to help the researcher identify the type of services that were offered to farmers by NAFIS. The identification of services being offered determined the extent to which information dissemination was being done. This enabled the researcher to analyse data and come up with findings as stipulated in Table 4.8.

Table 4.8: Services Offered by NAFIS to Cereal Farmers

<table>
<thead>
<tr>
<th>Services</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing information</td>
<td>190</td>
<td>84</td>
</tr>
<tr>
<td>Providing appropriate seeds</td>
<td>57</td>
<td>25.3</td>
</tr>
<tr>
<td>Providing farming alternatives</td>
<td>120</td>
<td>53</td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

From the findings in Table 4.8, it is observed that cereal farmers were benefitting from the services offered by NAFIS. This is despite the fact that there was lack of awareness which was experienced before. It can be presumed that cereal farmers were benefitting from information provided without prior knowledge that it was from NAFIS. It can also be assumed that there was a vast mass of information available that confused cereal farmers in identifying which information belonged to which institution. Omunadi (2014) reasons out that institutions offering information services should have sensitization programmes in place and brand the information for easy identification by their customers.
4.8.2 Utilization of NAFIS information

Utilization of information is closely related to information relevance. Accessibility of information also plays a major role in information utilization. To ascertain the level at which cereal farmers utilized information, they were asked if they were making use of NAFIS information in their farming activities. The findings are presented in Table 4.9.

Table 4.9: Utilization of NAFIS Information

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>145</td>
<td>64</td>
</tr>
<tr>
<td>No.</td>
<td>82</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td>227</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

From Table 4.9, findings indicate that the information provided was utilized by cereal farmers to enhance their farming activities. This may have been attributed to by use of technology by some farmers and NAFIS field staff that was available to assist farmers. The relevance of information and its access contributed much to information utilization. According to Wachira, Muggah & Munene (2005), the content of information available has an impact on its utilization. Information with local content that is suitable to the consumer leads to more utilization of the same. Outa, Etta & Aligula (2006), observe that the content part of the information was a key to its utilization. Such content should be defined by nature and scope of activities at hand.

These findings are a clear indication that NAFIS availed information to cereal farmers that was relevant, accessible and its content was customized, hence a boost to the utilization of the same.
4.8.3 Types of cereal farming strata

Farmers were put in different strata according to the type of farming they practiced in Maeni Ward. The strata helped the researcher establish the type of cereal that was being cultivated. This was an in-depth investigation on why there was a shortage of cereals in the county. Cereal farmers were asked to tick on the type of cereal that they were cultivating. They were required to tick as many as possible according to their activities. The findings are recorded in Table 4.10.

Table 4.10: Farming Strata

<table>
<thead>
<tr>
<th>Cereal Strata</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize Farming strata</td>
<td>202</td>
<td>89</td>
</tr>
<tr>
<td>Millet Farming strata</td>
<td>85</td>
<td>37.3</td>
</tr>
<tr>
<td>Sorghum Farming Strata</td>
<td>36</td>
<td>16</td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

The data in Table 4.10 indicate 202 cereal farmers were practicing maize farming, 85 were planting millet while 36 were planting sorghum. Maize farming was therefore mainly preferred by cereal farmers. It might be due to maize being regarded as a cash crop due to high demand by consumers. However, it is also noted that the prices of sorghum and millet tend to be higher than that of maize (NAFIS 2019). Lastly, it is noted from the findings that some of the cereal farmers were growing more than one cereal at a time.
4.9. Challenges in Accessing Information from NAFIS

Respondents were asked if they faced challenges in accessing information from NAFIS, and if so, to mention them. Their responses were as recorded in Table 4.11.

Table 4.11: Challenges of Information Access

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No proper channel of access</td>
<td>160</td>
<td>70.4</td>
</tr>
<tr>
<td>Slow internet</td>
<td>40</td>
<td>18</td>
</tr>
<tr>
<td>Inadequate awareness of NAFIS</td>
<td>57</td>
<td>25.3</td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

From Table 4.11, it is observed that there were challenges that hindered information dissemination by NAFIS to cereal farmers. Technology growth and change was contributing negatively to access of information by farmers. This was brought about by inadequate mobile phones with internet and inadequate awareness program. Challenges need to be minimized in order to serve the purpose and achieve the main objectives of institutions. Access and utilization of information is the main purpose of information creation agency (Ochola and Ojiambo, 2000).
4.10. NAFIS Staff Interview Report

These are findings derived from interviews conducted with NAFIS staff on various areas of the study. The areas include: staff training, information dissemination, awareness creation by NAFIS staff and information accessibility.

4.10.1 NAFIS staff training and information dissemination

The two NAFIS staff who were interviewed were requested to respond to several questions. This was to help the researcher come up with findings that would enrich the study. The interviews generated findings that are recorded in Table 4.12

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff training on service delivery</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Information update</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>Information relevance</td>
<td>2</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

The findings in Table 4.12, indicate that NAFIS was doing all in their power to ensure that cereal farmers were served by skilled personnel and that they got information that was relevant to their farming activities. Information update however posed a challenge to service delivery. Lack of information update mostly results into irrelevance of the information available. Ashraff, Gine
and Karland (2005) point out that the way field officers are providing information to cereal farmers is overstretches and also under-resourced. The available information need to be updated and content customized to suit customer needs.

4.10.2 Staff awareness creation

Information awareness creation is the catalyst towards information consumption and this assists in its management. The two NAFIS staff were asked a question through interview if they sensitized cereal farmers on NAFIS. The results achieved through the findings are shown in Table 4.13.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness creation</td>
<td>2</td>
</tr>
<tr>
<td>Awareness through shows</td>
<td>1</td>
</tr>
<tr>
<td>Awareness through field work</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

From Table 4.13, the findings depict a picture of awareness programme in place. However, more has to be done through agricultural promotions. Carysforth (2010), argues that it is the role of institutions that provide services to ensure that sensitization of their services is carried out through marketing and promotion activities such as agricultural shows. Awareness creation is a boost to the way customers perceive a service or product. Awareness programmes enhance the motivation of customers to actual utilization of the available information.
4.10.3 NAFIS information accessibility

NAFIS information was available on their website and farmers were also given mobile numbers to call whenever in need. The ease of information access is of importance to its usage. Most people will be associated with information if they have a direct access to it. Cereal farmers can only make use of information to improve their farming activities when they have an open access to it. The access of information also links NAFIS services to the activities being carried out by cereal farmers. NAFIS staff was asked how they ensured that farmers accessed the required information. The responses were as recorded in Table 4.14.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access on NAFIS website</td>
<td>2</td>
</tr>
<tr>
<td>Access on cell phones</td>
<td>2</td>
</tr>
<tr>
<td>Access through field staff</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: Researcher (2019)

From the findings in Table 4.14, it can be concluded that NAFIS information was accessible to cereal farmers of Kimilili Sub-County. This was in line with other findings reported on good harvest by cereal farmers which are an indication that the information was being accessed and utilized well. Access to appropriate information that helped in knowledge gain is an overriding stimulus for successful agriculture and its production for rural areas development, Outa, Etta & Aligula (2006). However, challenges arise through slow internet access to NAFIS website and lack of proper mobile gadgets that should facilitate access to information in need.
CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings, conclusions and recommendations of this study according to the objectives of the study, research questions and in relation to literature reviewed.

5.2 Summary

Cereal farming was mainly practiced by farmers between 26 and 55 years of age. This tends to be a group that is still energetic and productive in life. Most of them are of child bearing age and this might be a contributing factor as to why they are active in cereal farming activities. Female farmers in Maeni Ward of Kimilili Sub-County constitute a higher number of people who are practicing cereal farming as evidenced by the findings of the study.

The literacy level in Bungoma County that stood at 60.5% (USAID, 2014) was a pillar that could contribute positively to information access and use. However, a good number of cereal farmers lacked basic techno knowledge to operate techno gadgets to access available information. However, the cereal farmers showed a positive result in the findings that revealed good harvest in farming which is an indication that information was being used to improve development in farming activities.

From the findings, it is revealed by cereal farmers that awareness creation was poorly done by NAFIS to sensitize on their services. However, NAFIS staff gave a contradicting report on this which showed that awareness creation was a priority of NAFIS. There are therefore gaps in
awareness creation that should be sealed by NAFIS to serve their purpose to the people of Maeni Ward.

In this study, it was revealed that NAFIS availed information on their website which required technology gadgets for access. Mobile telephones were mostly used by farmers to get further information by calling a number that was given. Farmers with Mobile phones with internet access were able to access NAFIS website. The farmers therefore needed to acquire mobile bundles so as to be able to access the internet and hence the website. This becomes a limiting factor as not all farmers were able to afford the bundles all the time. Also, not all the farmers had phones that could access the internet. From the findings, 59.3% of the farmers did not have phones with internet connection and they were therefore not able to access NAFIS website. Only 40.7% of the farmers had phones with internet connected. This result shows the evidence of the 36% of farmers who did not make use of or did not utilize NAFIS information and it can therefore be confidently concluded that, one of the reasons for lack of use is that the farmers did not have access to internet and the website.

The literacy level in Bungoma County was reported as high. It is therefore a pillar that could contribute positively to information access. However, most farmers lacked knowledge of how to operate techno facilities for access to information. According to this finding, literacy level of farmers in Bungoma is confirmed to be high and it relates well with the existing literature. Fifty seven percent of farmers who participated in this study were well educated with 32% being college graduates and 25% being university graduates. Another 30% were of secondary school level and only 13% were of primary school level. This shows a positive attitude towards information utilization. However, most of them did not know how to access this information.
Nevertheless, the study posted 54% good harvest for farmers utilizing the information provided by NAFIS.

Interviews were conducted by the researcher with two NAFIS staff and the exercise was a success. The success was attributed to the use of structured questions which only required a tick or short answers. Findings from this tool were as follows: NAFIS staff were all trained; information was updated regularly; information was disseminated as per geographical regions and in accordance with regional farming activities; awareness was created during agricultural shows and field days which were organized with Ward administrators; information was on NAFIS website and farmers were also given cellphone numbers to call for more farming information.

5.3 Conclusion

Based on the findings, it is evident that farming practices are being carried out by more women than men. The age factor also plays a major role in farming activities. Farming activities revolve around generation of people who are mature enough to make sound decisions, energetic group body wise and these people fall under the age bracket of 26 and 55 years. This is a productive age group in society and governments can rely on them for development.

Secondly, on findings that emerged through creation of awareness, it is logical to conclude that institutions that are tasked to disseminate information to farmers were doing little to sensitize them on their services. Cereal farmers also contributed to this challenge through their general and ignorance of some new evolving aspects.

Thirdly, based on the findings that developed through information technology gadgets, it is fair to conclude that suitable technology gadgets were not affordable to cereal farmers due to high
poverty levels in the region. Illiteracy in technology also hampered the use of techno gadgets while lack of compatibility in the gadgets raised issues connected to access to information. Lastly, lack of internet connectivity hindered ease of access to information by some of the cereal farmers.

Fourthly, based on the findings that evolved through relevance of available information, it can be concluded that information technology has developed with vast masses of information and this puts farmers in a big dilemma on choosing the most appropriate information to use. Relevance of information highly depends on its updatedness, timely accessibility and recipients’ needs and demands being met appropriately.

Fifthly, based on the findings that emanated through challenges faced by Information dissemination, it can be concluded that information dissemination, just like any other service in institutions is being hindered by several elements. These elements are mainly poverty among cereal farmers; techno-illiteracy in some cereal farmers; lack of awareness by cereal farmers and some ignorance. These challenges are likely to be minimized if proper policies are put in place.

5.4 Recommendations

The research findings have enabled the writer to come up with the following recommendations:

5.4.1 General recommendations

i. Institutions tasked with duties of disseminating information to farmers should do thorough marketing in rural areas where farming is mostly done.

ii. More funds for marketing should be allocated to enhance a through promotion of services being offered to cereal farmers.
iii. Promotions of information dissemination should be first priority in institutions that provide such services.

iv. The cost of information technology gadgets should be subsidized so as to make them affordable for cereal farmers.

v. The Government of Kenya should avail free internet services to rural areas so as to avail accessible information to farmers which enhances food security.

vi. NAFIS should ensure that information availed to cereal farmers is suitable for their farming activities.

5.4.2 Policy recommendation

i. Government of Kenya policy on education states that education is free and compulsory to primary school going children. This policy should be modified to include adults who missed out in their tender years so that they too can benefit.

ii. Education policy in Kenya should include ICT training in the school curriculum at different levels.

iii. Kenya Government should provide for ICT training to farmers in rural areas so as to enhance information access and use.

iv. Kenya Government should facilitate growth in broadband in order to improve on the speed of internet and hence reduce the cost of acquiring mobile data bundles, and if possible, provide free internet services to rural areas.

v. County governments should be mandated to ensure there is development of ICT infrastructure in their areas of jurisdiction to facilitate fair distribution of resources.
vi. Institutions that are mandated to disseminate information to rural farmers should support local content in order to be able to provide their services to rural areas with minimal challenges which will enhance more access and utilization of information.

vii. Kenya Government to create or develop knowledge sharing networks at grassroots level that will benefit common citizens in knowledge gain and development growth.

5.4.3 Recommendations for further research

More research should be conducted on information dissemination to determine the extent of local content usage from the information available to cereal farmers in rural areas. There is evidence of good harvest in cereal farming despite the looming shortage experienced in the country. This calls for more research to determine whether the farming produce is stored well or it is destroyed in farms.
REFERENCES

34067031843443pdf


**UN 2030 SDG’s.** The 17 sustainable development goals. Retrieved from: https: una-gp-org>the-sustainable-devel...


Zappa, M. (2014). *15 Emerging agriculture technologies that will change the world*. Canada: Policy Horizons

APPENDICES

APPENDIX I: INTRODUCTORY LETTER TO FARMERS

My name is Rachel Andisi Mwanzi, a final year student at Kenyatta University, pursing a Master of Library and Information Science Degree. I am humbly requesting for your cooperation to help me carry out a research on The Impact of National Farmers Information Service on the Cereal Farming Activities in Maeni Ward, Kimilili Sub-County, Bungoma County, Kenya. Your response to the questions in the attached questionnaire will be is highly appreciated and will be treated with confidentiality and used for study purposes only. Thank you for your assistance.
APPENDIX II: QUESTIONNAIRE FOR FARMERS

This questionnaire is designed to help the researcher make an assessment of the access and utilization of information disseminated by NAFIS to cereal farmers in Maeni Ward of Kimili Sub-County in Bungoma County. The information you give will be used for the purpose of the study only. Please respond to all the Items by a tick [✓] or a brief explanation as the question may require.

Section 1: Demographic Data

1. Gender: Male [ ] Female [ ]

2. Name of Area

3. What is your age bracket?
   - Below 25 years [ ]
   - 26-55 years [ ]
   - 56 years and above [ ]

4. What is your education level?
   - Primary [ ]
   - Secondary [ ]
   - Tertiary [ ]
   - None of the above [ ]

Section 2: NAFIS Information service to cereal farmers

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4. Do you know of NAFIS? Yes [ ] No [ ]

5. If yes to question 4, what are some of their services

6. Do you make use of NAFIS information in your farming? Yes [ ] No [ ]

7. If yes to question 6, how frequent? Daily [ ] Weekly [ ] Monthly [ ] Quarterly [ ]

8. If no to question 6, what is the cause of not using the information?

9. Do you benefit from using the information disseminated by NAFIS? Yes [ ] No [ ]

10. Please give a brief explanations of the benefits

11. How do you access the NAFIS services in your area? Through:

   Field officers [ ]

   NAFIS website [ ]

   Radio [ ]

   Mobile phone service [ ]

12. How do you rate NAFIS in terms of service delivery?

   Fast [ ] Very Fast [ ]
13. Are you a computer compliant? Yes [ ] No [ ]

14. If yes to question 13, to what level? 

15. Do you face any challenges in accessibility of NAFIS information dissemination? Yes [ ] No [ ]

16. If yes to question 15, mention some of the challenges

17. Which type of phone do you use? One with access to internet [ ] one without access to internet [ ]

18. Which farming strata do you belong to? ( ) Maize farming strata, ( ) Millet farming strata, ( ) sorghum farming strata
APPENDIX III: INTERVIEW SCHEDULE FOR NAFIS STAFF

This interview is designed to help the researcher assess the information dissemination services provided by NAFIS to cereal farmers in Maeni of Kimilili Sub-County in Bungoma County. The information you give will be used for the purpose of the study only. Please respond to all the questions by responding appropriately and also giving a brief explanation as may be required.

Section 1: Demographic Data

1. Gender: Male [ ] Female [ ]

2. Name of your work Area ..............................................................

3. What is your age bracket?
   - Below 25 years [ ]
   - 26-45 years [ ]
   - 46-55 years [ ]
   - 56 years and above [ ]

Section 2: NAFIS services and staff Development

4. What is your highest level of academic qualification?
   - Certificate [ ] Diploma [ ]
   - Degree [ ] Masters [ ]
5. Are you a trained NAFIS staff? Yes [ ] No [ ]

6. How long have you worked for NAFIS?
   Less than 1 year [ ] 1-5 years [ ] 6-10 years [ ]
   11-15 years [ ] 16 years and above [ ]

7. What services do NAFIS offer? ..............................................................

8. Which farming activities are practiced in the area?
   ...........................................................................................................

9. To what extent have you sensitized farmers? ...........................................

10. How do you ensure farmers access the required information? ............... 

11. Briefly explain how your information is stored? ....................................

12. Is the information stored relevant to the cereal farming activities? Yes [ ] No [ ]

13. How do you ensure information is relevant? ...........................................

14. Are you a computer compliant? Yes [ ] No [ ]

15. If yes to question 14, what level? ........................................................

16. If No to question 14, what plans does the institute have in terms of staff
development? ........................................................................................

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## APPENDIX IV: WORK PLAN

<table>
<thead>
<tr>
<th>Activity</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept Paper</td>
<td>April 2015</td>
</tr>
<tr>
<td>Consultations with supervisor</td>
<td>May 2015- October 2016</td>
</tr>
<tr>
<td>Research Proposal</td>
<td>November 2016</td>
</tr>
<tr>
<td>Field Research</td>
<td>February - April 2018</td>
</tr>
<tr>
<td>Research Report</td>
<td>May 2019</td>
</tr>
</tbody>
</table>
## APPENDIX V: BUDGET

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>COST PER ITEM ( \text{ksh} )</th>
<th>TOTAL COST ( \text{ksh} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ream of paper</td>
<td>4</td>
<td>600.00</td>
<td>2,400.00</td>
</tr>
<tr>
<td>Transport</td>
<td>14</td>
<td>1000</td>
<td>14,000.00</td>
</tr>
<tr>
<td>Accommodation</td>
<td>6</td>
<td>2500</td>
<td>15,000.00</td>
</tr>
<tr>
<td>Typing services</td>
<td>250</td>
<td>40.00</td>
<td>10,000.00</td>
</tr>
<tr>
<td>Photocopying services</td>
<td>350</td>
<td>5.00</td>
<td>1,750.00</td>
</tr>
<tr>
<td>Binding services</td>
<td>10</td>
<td>100.00</td>
<td>1000.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-</td>
<td>-</td>
<td>44,150.00</td>
</tr>
</tbody>
</table>
APPENDIX VI: MAP OF KIMILILI SUB-COUNTY

IEBC REVISED KIMILILI CONSTITUENCY COUNTY ASSEMBLY WARDS

Legend

- Constituency Boundary
- Sublocations
- PROPOSED COUNTY
- ASSEMBLY WARD
  - Chebukwabi
  - Kibingei
  - Kimili
  - Maen
  - Muhonge
  - Nasudi
  - Sikendu
  - Nabikoto
  - Kamukuywa
  - Makhonge

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