

**FACTORS THAT DETERMINE THE DEVELOPMENT OF A  
MARKETING INFORMATION SYSTEM: THE CASE OF THE KENYA  
AGRICULTURAL COMMODITY EXCHANGE**

**BY**

**GITHUKA PRISCA WANJIRU**

**UNIVERSITY OF NAIROBI  
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## DECLARATION

This project report is my original work and has not been presented for a degree in any other university for academic purposes.

SIGNATURE  \_\_\_\_\_

DATE 17/10/07

**GITHUKA PRISCA WANJIRU**

**REG NO: D61/P/9073/01**

This Project report has been submitted for examination with my approval as the University supervisor.

SIGNATURE  \_\_\_\_\_

DATE 25/10/07

**MR. JEREMIAH KAGWE**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

**SCHOOL OF BUSINESS**

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## **DEDICATION**

This project is dedicated to my wonderful mum Ekra Wahu , my dearly beloved ones: my late brother Peter Mwangi and my late sister Teresia Wangui who saw me through school and made my dreams become a reality.

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## LIST OF ABBREVIATIONS

Agri-food	Agricultural food
CAD	Computer-Aided Design
DSS	Decision Support Systems
EIS	Executive Information Systems
FAO	Food Agricultural Organization
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GOK	Government of Kenya
ICT	Information and Communication Technologies
IT	Information Technology
IVR	Interactive Voice Response service
KACE	Kenya Agricultural Commodity Exchange
MICs	Market Information Centres
MIPs	Market Information Points
MIS	Marketing Information System
MIS	Management Information Systems
MOA	Ministry of Agriculture
MOLFD	Ministry of Livestock and Fisheries Development
NTBs	Non-trade barriers
PDAs	Personal Digital Assistants
RECOTIS	Regional Commodity Trade and Information System
SMEs	Small Micro Enterprises
SMS	Short messaging service
SPSS	Statistical Package for Social Sciences



## **ABSTRACT**

The overall objective of the study was to establish the factors that determine the development of a marketing information system. The study aimed to support processes and to provide some insight into the issues, opportunities and limitation regarding the potential role of MIS in future agricultural sector activities.

A descriptive survey was undertaken. This was a case study of Kenya Agricultural Exchange (KACE). The population of study was farmers served by KACE and management staff of KACE located in all the eleven outlets countrywide. A representative sample of 18 members of staff, who represent 20% of the population and two farmers in each of the outlets were interviewed making a total of 22 farmers.

A desk study was undertaken by reviewing the relevant literature which included various websites, books, magazines, journals and available reports from the various government ministries. The desk study ensured that the research did not duplicate other studies, and instead make a significant contribution toward the subject of study.

The data was analyzed by employing descriptive statistics such as percentages, frequencies and tables. Statistical Package for Social Sciences (SPSS) was used to aid in analysis. Computation of frequencies in tables, charts and bar graphs was used in data presentation. The information was presented and discussed as per the objectives and research questions of the study.

Findings of the study indicate that when it is in line with their business strategies, private companies can also develop MIS, which benefits poor farmers with a high chance of success and sustainability. However, the information quality and its usefulness to the users need to be continuously assessed and improved. Member based organizations also find it appropriate to

manage MIS to offer marketing information to their members in exchange of the membership fee and members' support.

The project report is structured into five chapters, as follows:- Chapter one covers the introduction, chapter two presents the literature review while chapter three presents the methodology of the study. Chapter four presents the findings of the study while chapter five presents a summary of the findings, conclusions and recommendations.

# CHAPTER ONE: INTRODUCTION

## 1.1 Background

### *1.1.1 Marketing Information System in the agricultural sector*

The main purpose of marketing information system (MIS) is to support in marketing decision making and marketing efforts of entrepreneurs and farmers (FAO 1995). Nevertheless, the information is also useful for various types of organizations, such as government, development organizations, academicians, and researchers. Governments find marketing information useful for developing policies and state's support programs, whereas development organizations use the information for developing community support programs and better tuning their technical assistance to the needs of the farmers.

The majority of farm producers in developing countries maintain a significant, if somewhat varying, degree of autonomy from the market. The term "peasant" is used to capture a situation of farm producers who are neither confronted with competitive markets of farm inputs and outputs nor fully committed to production for sale in the market (Ellis, 1988). It is in contrast to a situation faced by profit maximizing farmers in developed countries who are directly connected to a market, locally as well as internationally. They respond rationally to market signals since they can access, collect and interpret market information efficiently and effectively.

Most farm producers in developing countries confront incomplete or imperfect markets for their inputs and outputs. Sometimes markets exist but work defectively due to lack of information (Stiglitz, 1986). Peasants have limited access to timely and reliable market information. On the

other hand, traders especially inter regional and large traders generally have a good access to the information since they have better facilities and sell commodities to the market everyday. The asymmetry of marketing information generally argued to be the main reason for the existence of excessive profit margin in traditional marketing channel. In this case, peasants are becoming a victim of opportunist's traders who take advantage of an information asymmetry situation for the trader's personal profit gain.

Marketing Information Systems (MIS) have the potential to support the agri-food sector in coping with the challenges but they are also key enablers for some of the developments to take place. Today's drive towards globalization builds on modern communication technology, but it is also accelerated by the technology's communication ability. From this dual perspective, the adoption of MIS by members of the agri-food sector is no longer a question of choice but of survival. A choice, however, is the extent the sector will utilize the support potential of MIS within the not so distant future. However, the difficulty in anticipating technology evolution and its effects is compounded not only by its rapid change and lack of understanding of technology but also because the ultimate evolution is a social choice. Society will ultimately choose a potential outcome depending on decisions made on investment, acceptance, adoption and rejection (Schiefer and Zazueta, 2003).

The evolution builds on decisions by the many groups that constitute the sector's activity, involving enterprises, and policy, extension or service institutions of any kind and on their cooperation in the specification of a common development view. This project paper to support provides some insight into the issues, opportunities and limitation regarding the potential role of

MIS in future agricultural sector activities.

### ***1.1.2 Profile of Kenya Agricultural Commodity Exchange (KACE)***

Kenya Agricultural Commodity Exchange (KACE) is a private sector firm launched in 1997 to facilitate linkage between sellers and buyers of agricultural commodities, provide relevant and timely marketing information and intelligence, provide a transparent and competitive market price discovery mechanism and harness and apply information and communication technologies (ICTs) for rural value addition and empowerment.

*KACE's vision:* To be a Commodity Exchange of the highest integrity, facilitating competitive and efficient trade in agricultural commodities in Kenyan, regional and international markets.

*KACE's mission is:* To establish a Commodity Exchange in Kenya of the highest integrity, available to Kenyan as well as regional and international traders based upon an open free market system for the mutual benefit of sellers and buyers, and to facilitate the marketing of any commodity provided or desired by any consenting parties through the auspices of the exchange.

*KACE objectives:* (1) To facilitate linkage between sellers and buyers, exporters and importers of agricultural commodities in trade; (2) To provide farmers and market intermediaries (traders, brokers, processors and consumers) with relevant and timely marketing information and intelligence, and other services that enhance their bargaining power and competitiveness in the market place; (3) To provide a transparent and competitive price discovery mechanism through the operations of the exchange trading floors; and (4) To harness and apply the power of information and communication technologies (ICTs) as a strategic tool for rural value addition and empowerment.

KACE has developed a Market Information System (MIS) based on the application of modern information and communication technologies (ICTs) designed to help farmers, especially smallholder poor farmers in remote rural areas, to access better markets and prices for their produce. ([www.kacekenya.com](http://www.kacekenya.com)). The KACE MIS has different components designed to collect, process and provide market information to clients at different stages in agricultural commodity value chains: from the smallholder resource-poor farmer to the internet-connected commodity dealer, exporter or importer who serve as market outlets for the smallholder farmer. The components of the KACE MIS are: Market Information Points (MIPs) ; Market Information Centres (MICs) ; Short messaging service (SMS) ; Interactive Voice Response (IVR) service ; Regional Commodity Trade and Information System (RECOTIS) ; Web Site; and Radio.

## **1.2 Statement of the problem**

Smallholder resource-poor farmers lack relevant and timely market information and intelligence to access better markets and better prices for their produce. As a result, the farmers are often exploited by middlemen and traders in local markets who offer relatively low prices, sometimes below production costs. In addition they remain ignorant of better market (price) opportunities that exist elsewhere in liberalized markets. Low prices and lack of access to better markets result into low farm incomes, keeping the farmer in a vicious circle of poverty.

In the absence of market information and market linkage mechanisms, it is common to find situations of artificial food scarcities, as food surplus areas co-exist with areas of food deficits. This has the effect of lowering farm gate prices in surplus areas, resulting in reduced incomes for farmers, and raising consumer food prices in deficit areas, leading to food insecurity for the poor in those areas. (Mukhebi 2007)

The researcher was able to identify two studies i.e. Asaba et al (2007) and Meuleman (2007) relevant to the KACE MIS, as having been carried out to date. These studies focused on the impact of the different KACE MIS products on the farmers and the community. She did not come across a study that has been carried out to identify the factors that determine the development of the MIS in KACE. Hence this study was different, as it sought to identify the factors that determine development of KACE MIS.

### ***1.2.1 Specific Research questions***

1. What are the factors that drive the development of a Marketing Information System?
2. What are the benefits derived from implementation of a Marketing Information System?
3. What challenges face the development and implementation of a Marketing Information System?

### **1.3 Objectives of the study**

The overall objective of the study was to identify the factors that determine the development of a marketing information system.

The sub objectives include:-

- i) To establish the benefits derived from implementation of a M.I.S.
- ii) To determine the challenges encountered in the development and implementation of a Marketing Information System.

### **1.5 Importance of the study**

The implementation of the MIS development paths presented in this report will transform the production and trade of agricultural produce, strengthen the relationships between participants in the supply chain from farmers to consumers and the market infrastructure in agriculture.

The academic researchers will use the study findings to stimulate further research in this area of agricultural marketing and as such form a good background for future researches. The study will thus contribute to the existing body of knowledge in the area of agricultural marketing.



## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 The Kenyan Agricultural sector**

Agriculture is the backbone of the Kenyan economy and studies have shown that there is a direct relationship between agriculture and the economy. When there is growth in the agricultural sector this impacts positively on the economy and vice versa. (GOK, 2004). Further, in the Economic Recovery Strategy, GOK, 2004, the government has identified agriculture as an important tool and vehicle for the realization of its objective namely to create employment and reduce poverty in Kenya. It contributes directly 26% of GDP and 60% of the output earnings. Through links with manufacturing, distribution and service related sectors; agriculture further contributes a further 27% of the country's GDP. 56% of the Kenyan population lives below the poverty line with over 80% of them in the rural areas who solely rely on agriculture as a means of livelihood. Majority of the Kenyan population is food insecure. 50.6% of the population lack access to adequate food and even the little they get is of poor nutritional value and quality. (MOA & MOLFD, 2004). From the above we see that agriculture is very important in Kenya and the government has to do all it can to ensure that this very crucial sector is successful. The government therefore has to embrace broad based growth and development in agriculture.

Information can be said to be the fuel that drives agriculture. As the famous adage says, "an uninformed person is a poor person." Inadequate markets and marketing infrastructure have been quoted as some of the constraints to agricultural development. This is because agricultural marketing information and infrastructure are poorly organized and institutionalised. The domestic market is also small and lacks an effective marketing information system and infrastructure. The dependence on a few external market outlets makes agricultural exports very vulnerable to changes in the demand for agricultural products and unexpected imposition as non-trade barriers (NTBs) by foreign markets (MOA & MOLFD, 2004).

### **2.2 Information concept**

Massie (1995) defines information as data that is relevant to the needs of managers in performing their functions. He goes on to say that information is power. This fact has been recognized since

birth of civilization. Throughout the process of collecting information, managers have tended to construct systems for collecting, recording, storing and processing information to aid in reaching their objectives with special- purpose to accounting systems, production systems, purchasing systems, filing systems and so on.

“Information networks straddle the world. Nothing remains concealed. But the sheer volume of information dissolves the information. We are unable to take it all in.” *Grass, Gunther.*

Managers may be hindered by excess data and frustrated by meaningless messages. It is important to note that there is always information overload as too much information is provided at all times. However there is need for all the managers to assess the information that they really need against what they have and what is provided.

McEwan (1997) states that access to information, resources and the ability to act quickly makes it possible to accomplish more and to pass on more resources and information to subordinates. He goes on to emphasize that to be effective, managers need to be “in the know” in both the formal and informal sense. In the information age learning takes place in all directions not just from top down or from headquarters out. Due to information dissemination, managers are informed of company decisions at all levels, at all times which is good for the growth and development of the organization.

Kanter (1997) says that to promote innovations, businesses need to tap and share “soft knowledge”- insights, intuitions and hunches. Information dissemination also raises productivity; increases quality; promotes understanding across functions and learning across companies. It further drives functions and helps build teams. collecting, analyzing and using data helps in

meeting customers needs not just once but over and over again allowing the organization serve the customers without necessarily asking.

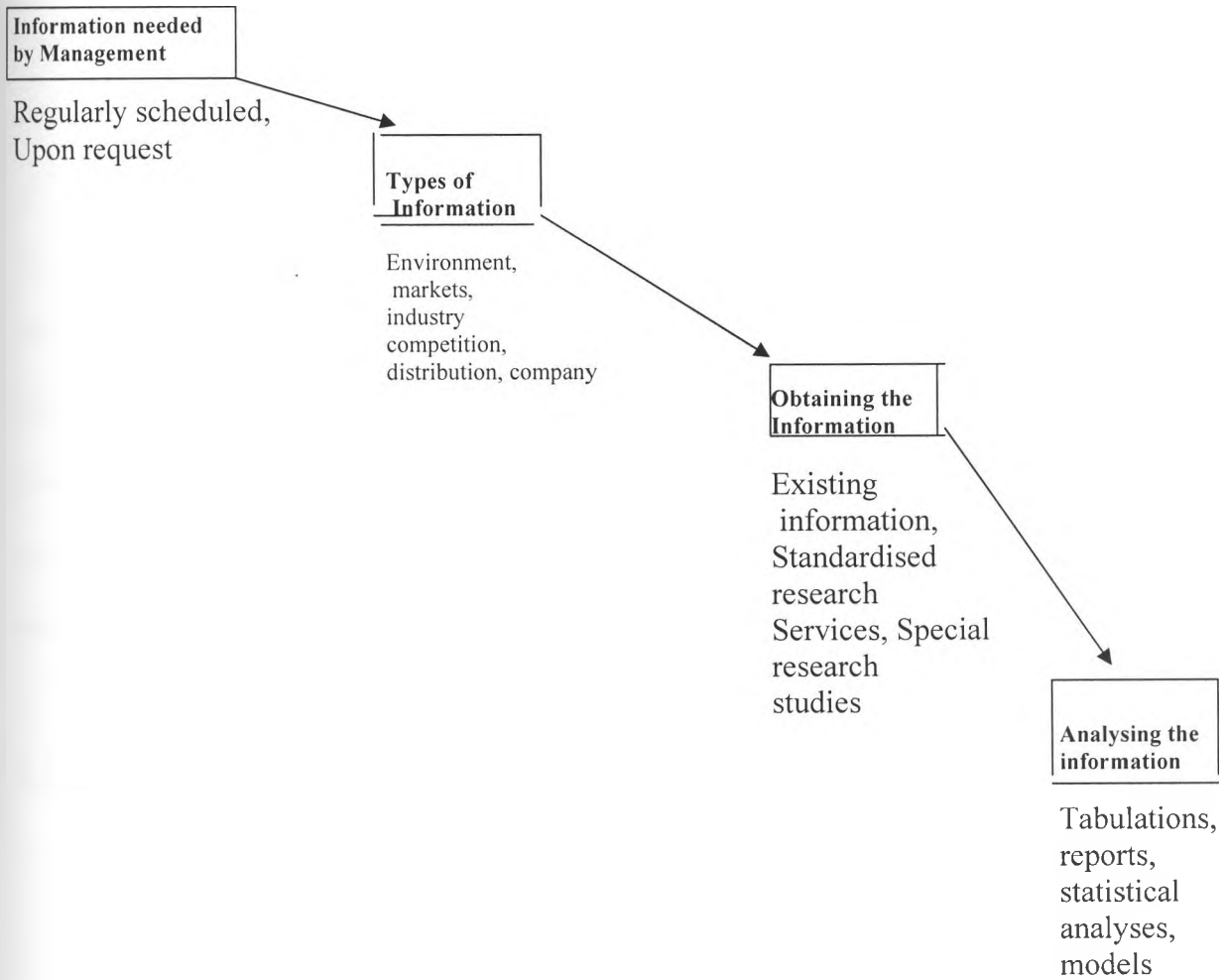
### 2.2.1 *Management information system (MIS)*

Mondy (1990) defines *management information system* as any organized approach for obtaining relevant and timely information on which to base management decisions.

*Marketing* is the performance of those activities that attempt to satisfy a given individual's or organization's target group needs and wants for a mutual benefit or benefits. (Kibera and Waruingi 1988). Mondy (2001) says that the purpose of marketing is to ensure that the proper product is offered to the customer at the right price and location and with the correct amount of promotion. Through computerised marketing systems, information is made available to the marketing manager concerning such vital areas as product profitability and advertising effectiveness.

White (2005) defines market linkages as a physical connection between the producer and the ultimate consumer. Linkages also provide financial transactions and are meant to facilitate the flow of produce between the different levels of the marketing system. The input to the process is the agricultural production (the supply) and the output is the consumption of that produce by consumers (the demand). Since both internal and external factors affect the organisation, they must be accounted for in the MIS. From the above figure MIS draws information from the various internal functional areas and integrates this information with that of external environment, resulting in creation of an information system. Both types of information are needed if managers are to perform effectively.

**Figure 2: Information planning for an MIS**



Source: David W. Cravens, Gerald E. Hills and Robert B. Woodruff (1996): Marketing Management, Krishan Nagar, Delhi: Richard D. Arwin, p 645

### **2.2.2 Marketing Information System**

Kotler (2004) defines a marketing information system as “a continuing and interacting structure of people, equipment and procedures to gather, sort, analyse, evaluate, and distribute pertinent,

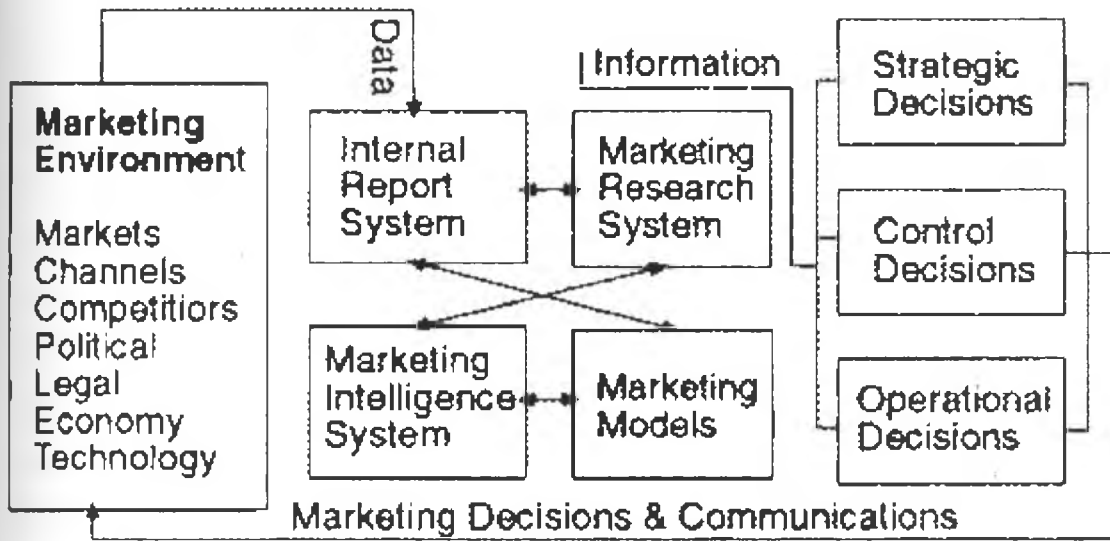
timely and accurate information for use by marketing decision makers to improve their marketing planning, implementation, and control". The rise of global marketing, the new emphasis on buyer's wants and the trends towards non- price competition has led to a high demand in market information.

To carry out analysis, planning, implementation and control responsibilities, marketing managers need a marketing information system (MIS). The role of MIS is to assess the managers' information needs, develop the needed information and distribute that information timely. Cravens (1996) says that an MIS that utilises computer capabilities permit analysis of marketing data for both long term and day to day decisions. An MIS is a firm's effort to acquire process information that meets regularly occurring marketing decision needs.

A MIS has four components:

- An internal records system, which includes information on the order to payment cycle and sales reporting systems.
- A marketing intelligence system, a set of procedures and sources used by managers to obtain everyday information about pertinent developments in the marketing environment.
- A marketing research system that allows for the systematic design, collection analysis and reporting of data and findings relevant to a specific marketing situation
- A computerized marketing decision support system that helps managers interpret relevant information and turn it into a basis for marketing action.

Figure 3: The marketing information systems and its subsystems



Source: [www.fao.org](http://www.fao.org)

### 2.2.2.1 Internal reporting systems

All enterprises, which have been in operation for any period of time, have a wealth of information. However, this information often remains under-utilised because it is compartmentalised, either in the form of an individual entrepreneur or in the functional departments of larger businesses. That is, information is usually categorised according to its nature so that there are, for example, financial, production, manpower, marketing, stockholding and logistical data ([www.fao.org](http://www.fao.org))

The internal records that are of immediate value to marketing decisions are: orders received, stockholdings and sales invoices. These are but a few of the internal records that can be used by marketing managers, but even this small set of records is capable of generating a great deal of information.

By comparing orders received with invoices an enterprise can establish the extent to which it is providing an acceptable level of customer service. In the same way, comparing stockholding

records with orders received helps an enterprise ascertain whether its stocks are in line with current demand patterns.

### ***2.2.2.2 Marketing research systems***

Marketing research is the function that links the consumers, customers and public to the market through information used to identify and define marketing opportunities and problems to generate, refine and evaluate marketing actions; to monitor marketing performances and to improve understanding of the marketing process. It specifies the information needed to address marketing issues, designs the method for collecting information, manages and implements the data collection process, analyses the results and communicates the findings and their implications. The process consists of defining the problem and research objectives, developing and implementing the research plan, interpreting and reporting the findings (Kotler, 2002).

Marketing research is undertaken so that one may be able to identify marketing opportunities.

Marketing research is a proactive search for information. The enterprise which commissions these studies does so to solve a perceived marketing problem. In many cases, data is collected in a purposeful way to address a well-defined problem (or a problem which can be defined and solved within the course of the study). The other form of marketing research centres not on a specific marketing problem but is an attempt to continuously monitor the marketing environment. The monitoring or tracking exercises and continuous marketing research studies often involves panels of farmers, consumers or distributors from which the same data is collected at regular intervals. ([www.fao.org](http://www.fao.org))

### ***2.2.2.3 Marketing intelligence systems***

Whereas marketing research is focused, market intelligence is not. A marketing intelligence system is a set of procedures and data sources used by marketing managers to sift information from the environment that they can use in their decision-making. This scanning of the economic and business environment can be undertaken in a variety of ways. Table 2.1 below presents some of the ways environmental scanning can be undertaken.

**Table 2.1: Types of environmental scanning**

Unfocused scanning	The manager, by virtue of what he/she reads, hears and watches exposes him/herself to information that may prove useful. Whilst the behaviour is unfocused and the manager has no specific purpose in mind, it is not unintentional
Semi-focused scanning	Again, the manager is not in search of particular pieces of information that he/she is actively searching but does narrow the range of media that is scanned. For instance, the manager may focus more on economic and business publications, broadcasts etc. and pay less attention to political, scientific or technological media.
Informal search	This describes the situation where a fairly limited and unstructured attempt is made to obtain information for a specific purpose. For example, the marketing manager of a firm considering entering the business of importing frozen fish from a neighbouring country may make informal inquiries as to prices and demand levels of frozen and fresh fish. There would be little structure to this search with the manager making inquiries with traders he/she happens to encounter as well as with other <i>ad hoc</i> contacts in ministries, international aid agencies, with trade associations, importers/exporters etc.
Formal search	This is a purposeful search after information in some systematic way. The information will be required to address a specific issue. Whilst this sort of activity may seem to share the characteristics of marketing research it is carried out by the manager him/herself rather than a professional researcher. Moreover, the scope of the search is likely to be narrow in scope and far less intensive than marketing research

**Source:** [www.fao.org](http://www.fao.org)

Marketing intelligence is the province of entrepreneurs and senior managers within an agribusiness. It involves them in scanning newspaper trade magazines, business journals and reports, economic forecasts and other media. In addition it involves management in talking to producers, suppliers and customers, as well as to competitors. Nonetheless, it is a largely informal process of observing and conversing. ([www.fao.org](http://www.fao.org))

Some enterprises will approach marketing intelligence gathering in a more deliberate fashion and will train its sales force, after-sales personnel and district/area managers to take cognisance of competitors' actions, customer complaints and requests and distributor problems. Enterprises



with vision will also encourage intermediaries, such as collectors, retailers, traders and other middlemen to be proactive in conveying market intelligence back to them.

### **2.3 Development of the MIS**

Cravens (1996) describe the following steps, which are involved in the development of an information system:

- Assessing the existing information system: In carrying out this process the following questions need to be addressed: what is the present flow of information, how is the information used, how valuable is the information in terms of decision making?
- Developing priority of needed information: MIS must ensure provision of high priority information and data lower on the priority list should be generated only if their benefits exceed the costs of producing them. Individual managers should develop own priority lists and integrate them into a list for the entire organisation. The needs of the entire organisation must be the controlling factor.
- Develop new information system: A system of required reports should be developed and diagrammed. Treating the whole organisation as a unit allows the elimination of duplicated information.

### **2.3 The MIS application Environment**

Today's agri-food sector has to simultaneously face critical challenges from a variety of sources. Globalization increases competition but also involves higher risks in food safety or quality. This development coincides with increasing pressures on the agri-food sector to intensify process controls and to improve on quality, food safety, the tracking and traceability of products throughout the supply chain, and the environmental consequences of its operations. This combination mounts to an unparalleled challenge regarding the sector's organization and efficiency. None of these challenges can be met by individual enterprises or enterprises of a

certain stage in the supply chain as, e.g., farms, alone. The close dependencies between all levels of food production require joint initiatives and new approaches for cooperation.

However, while the initiatives require a cooperate approach, they primarily build on changes in enterprises' internal activities and their interaction with each other. MIS is the key enabler and efforts are being made to integrate MIS opportunities in an appropriate way into these activities. Within these activity categories, the primary focus of current MIS developments is on three groups of activities: - market activities, process activities, and management decision and extension activities.

#### ***2.4.1 Market activities***

Market activities of enterprises focus on trading, logistics, and marketing. These activities determine market related business processes and are of relevance for the organization and efficiency of sector operations. Discussions on MIS support for market improvements involve food quality, food safety, traceability, and efficient consumer response (flexibility), and transaction efficiency, communication to support consumers' trust, and supply chain cooperation. The keyword for MIS support is communication and the utilization of the emerging integrated communication technologies.

#### ***2.4.2 Process activities***

Process activities in this context refer to enterprise internal processes in food production and

production control. Discussions on MIS support for process improvements involve, process reliability, process control, process efficiency, and the utilization of specific IT developments in comprehensive process management approaches like, e.g., precision agriculture. The primary focus of MIS support is automatic control and its process optimization.

### ***2.4.3 Management decision and extension activities***

Management decision support through appropriate IT-based systems like MIS (Management Information Systems), DSS (Decision Support Systems) or EIS (Executive Information Systems) housed inside an enterprise or provided by extension is established practice. They involve the collection, selection, processing and communication of information in one or two-way communication activities. Present IT developments add new dimensions to the accessibility and communication of information. They focus on comprehensive IT support environments that integrate with knowledge networks with local, regional or global knowledge bases.

## 2.5 MIS and efficiency/effectiveness

Cravens (1996) notes that information falls into 2 categories: regularly updated information supplied on a continuing basis to marketing management by internal and external sources- sales and costs analysis, market share measurements and customer analysis and information that is obtained when it is required for a particular problem or situation, new product concept tests, brand preference studies and studies of advertising effectiveness.

Information systems have to be designed to meet the way in which managers tend to work. A manager continually addresses a large variety of tasks and is able to spend relatively brief periods on each of these. MIS assists: in locating information critical to the company; getting adequate, timely and accurate information that the managers need. Organisations with superior information enjoy a competitive advantage over the others. Hence MIS assists companies choose its markets better, develop better offerings and execute better marketing planning.

A marketing information system assesses the information needs of marketing managers and obtains the needed information from several sources including internal records, marketing intelligence and marketing research. (Kotler 2004)

The behavioural models stress that managers work at an unrelenting pace and at a high level of intensity. They also emphasise that the activities of managers are characterised by variety, fragmentation and brevity. There is simply not enough time for managers to get deeply involved in a wide range of issues. ([www.fao.org](http://www.fao.org).) As a result managers require a timely and relevant information. MIS increases efficiency and effectiveness as it sieves information and only provides what is relevant and in a timely manner.

Managers want to work on issues that are current, specific and *ad hoc*. A MIS makes it possible for successful managers to control the activities that they choose to get involved in on a day-to-day basis

Marketing information systems are intended to support management decision-making.

Management has five distinct functions and each requires support from an MIS. These are: planning, organising, coordinating, decisions and controlling. ([www.fao.org](http://www.fao.org))

**Decision-making** is often seen as the centre of what managers do something that engages most of a manager's time. It is one of the areas that information systems have sought most of all to affect. Decision-making can be divided into 3 types: strategic, management control and operations control. (www.fao.org.)

**Strategic decision-making** is concerned with deciding on the objectives, resources and policies of the organisation. This process generally involves a small group of high-level managers who deal with very complex, non-routine problems. The implications of strategic decisions extend over many years, often as much as ten to fifteen years. (www.fao.org.)

**Management control decisions** are concerned with how efficiently and effectively resources are utilised and how well operational units are performing. Management control involves close interaction with those who are carrying out the tasks of the organisation; it takes place within the context of broad policies and objectives set out by strategic planners. Management control decisions are more tactical than strategic. (www.fao.org.)

**Operational control decisions** involve making decisions about carrying out the "specific tasks set forth by strategic planners and management. Determining which units or individuals in the organisation will carry out the task, establishing criteria of completion and resource utilisation, evaluating outputs - all of these tasks involve decisions about operational control. The focus here is on how the enterprises should respond to day-to-day changes in the business environment. In particular, this type of decision-making focuses on adaptation of the marketing mix. (www.fao.org.)

MIS, in electronic form or otherwise, can support the above roles in varying degrees. MIS enhances a manager's presentation of information. McCarthy and Perreault (1993) state that a marketing information system organises incoming data in a database so that it is available when needed. It helps in improving all aspects of planning- blending all the four P's into mixes, developing and selecting plans. A marketing information system can also monitor the

implementation of current plans, comparing results against plans and making necessary changes more quickly, it assists in solving real marketing problems.

## **2.6 Implementation of MIS in agriculture**

Fritz (2001) asserts that the integration of a process-fitting combination of the technologies into business environments of agriculture and the food industry requires cooperation in various dimensions.

- It requires cooperation between different areas of competence as, e.g., competence in information technology or competence in business and market management. The competence cooperation requirement is one of the main obstacles in the development and implementation of appropriate concepts for IT support in agri-food trade.
- It requires cooperation between groups of enterprises from all stages of the food supply chain, extension organizations, market organizations, and other related services to make decisions regarding, among others, the organization of communication processes in market activities, the communication content, the delivery technology (multi-media alternatives) or the portal infrastructure.
- It requires cooperation between the providers of IT technologies and services to secure the technical feasibility and efficiency of digital integration and to adapt technology to content.
- It requires cooperation among small-scale enterprises, especially farmers, to be able to utilize the emerging digital environments and to open opportunities for virtual cooperation.
- It requires cooperation between users, research, extension and system design to arrive at applications which best fit the operational needs of users.

- It requires cooperation in the development of system marketing strategies, the development and implementation of training opportunities.

The multitude of cooperation needs cannot be organized in a comprehensive way. However, they need to be promoted and encouraged to support the adoption of technologies and to gain from IT support within the sector as soon and as much as possible (Hausen, 2002). As most of the developments have a distinguished sector dimension, their implementation cannot be decided by individual enterprises alone. This asks for the engagement of organizations with sector-wide acceptance to take an active promotional role and to actively initiate and coordinate necessary cooperation activities. Klusch (2001) argues that society will ultimately choose a potential outcome depending on decisions made on investment, acceptance, adoption and rejection'. It is at this point where decisions have to be made and where responsibilities of society would have to come in.

The link between the sectors organizational-technological development and society's responsibilities derives from society's interest in the driving forces for the technological developments discussed in the paper, including the sector's competitive efficiency, the need to assure food quality, food safety, and consumer trust, and the interest in better environmental control. These responsibilities might be represented by sector-based organizations or policy institutions with sector-interest (Whinston, 2000).

According to Napitupulu (1998), based on the MIS purpose and organization managing it, the marketing information systems can be broadly categorized as follows.

(i). ***MIS supported by development projects*** - MIS systems managed under development projects have generally a focus of supporting grassroots communities and entrepreneurs. The direct information users can be other development projects, development organizations, government line agencies, enterprises, and other participants in the product value chain, but the implied assumption is that these users' activities contribute to improve the situation of the target grassroots communities. Such marketing information systems customarily begin with explicitly mentioned objectives, target users, and mechanisms for managing the system. Such systems are found to be introduced at the local to the national levels.

(ii). ***MIS of agri-enterprises*** - The main users of such an MIS are the internal clients of the organization, and the MIS supports the marketing efforts and marketing decision making of the concerned company and its network. Agri-business houses have their MIS, and can involve their business partners as the users of the MIS. Controlled information is shared with various layers of decision makers and various departments within the company; and the externals to the company can receive the information that the company believes supports the company's business objectives (supply chain management, product positioning in the market, sales facilitation, and public relation).

(iii). ***MIS services of member based organizations and business service providers*** - As one of the services to their members, member based organizations like trade association, producers groups, and cooperatives groups provide marketing information services. Most of the time, the members indirectly or directly contribute funds to managing such information systems and services. Development projects are also found catalytic to the evolution of such marketing information services.



(iv). MIS services managed by service providers are often in tune to the needs of their clients who are mostly the business communities, who can pay a price for the information and services. MIS services include frequent updates on product demand and prices; market research and analysis on specific products and issues; general market news, and customized services for feasibility study; business planning; marketing research; and product positioning. Some information is provided free of costs to all, whereas the other information like marketing analysis, frequent information updates, and customized services are exclusive to the fee based members. However, some information service companies can also provide marketing information free of costs to their audiences. For example, some newspapers and websites of media companies and not-for-profit companies provide marketing information services to broad public or registered users, often times, free of cost.

(v). ***MIS managed by government*** - The prime objective of the government managed MIS is to generate information for policy making, developing agriculture support programs, and facilitating the effective delivery of government technical and legal services to business communities, development organizations, and farmers. Macro level agriculture production and trade data, policy information, agriculture best practices, agricultural crops farming technologies, and information about the agriculture sector participants are mostly included in the MIS services. Some marketing information systems of governments can also be like those supported by development projects, and can target particular communities with focused objectives.

Nevertheless, development projects can facilitate initiation of any of above types of MIS. Providing marketing information to remote communities and enterprises on a regular basis is,

however, challenging. The agricultural sector in Kenya being relatively unstructured and underdeveloped, the difficulty of managing MIS in a cost effective and sustainable manner is high. Nevertheless, the potential contribution of MIS to the development of this sector and thus supporting many dependent communities seems very high. Private business service providers and internal MIS system of private businesses might not be able to provide services to benefit the poor communities. Thus, in such case, projects or governments facilitated MIS can be the only option. However, how the marketing information needs of the target beneficiaries will be efficiently and effectively addressed even after the project period (in case of project) is a question that needs attention from the beginning.

## **2.7 Principal Technology Development Lines**

The far-reaching effects of IT on all aspects of society are common knowledge and expressed by references to today's age as the 'information age'. IT refers to a rapidly expanding range of services, methods, techniques, applications, equipment, and electronic technologies used for the collection, manipulation, processing, classification, storage, and retrieval of recordable information and knowledge (Hausen, 2002).

Verlag (2003) stated that any single technology within this almost unlimited variety could be linked to human activities in the agri-food sector and might have a profound effect on them. However, one could delineate groups of related technologies with a similar direction of impact on the sector. They constitute major IT development lines that could directly be linked to future developments of the agri-food sector:

*Digital integration:* eliminates technology breaks;

*Multi-media interaction:* utilizes the full potential of human perception;

*Electronic communication networks:* provide communication infrastructure;

*Information Portal technology:* provides access points to digital knowledge spheres;

*Virtual platforms for collaboration:* facilitates digital group interaction; and

*Agent technology:* reduces needs for human intervention

They all build on the ongoing digital integration that allows uninterrupted information flows from the source to the end and on the emergence of the multi-dimensional information sphere that builds on internet information technology and defines a digital information environment in its own rights. It allows, within its sphere, the creation of all types of communication infrastructures, communities, warehouses, shops, meeting places, services, etc., digital duplication of our visible world.

Hausen (2002) concluded that the development lines are related to all areas of sector activities and change the way they are being performed in the future. However, the potential impact of IT on the sector as a whole is most pronounced in market activities which determine the sector's infrastructure, the interaction of enterprises and the transaction of food products on the regional, national or global level.

## 2.8 Factors that determine the effectiveness of a MIS

An efficient and functioning marketing system is a precondition for agricultural diversification and improved nutrition. This enables better prices to be obtained by producers (leading to higher incomes) and improves the availability of competitively priced produce to consumers. The marketing process needs to be undertaken as efficiently as possible, at the lowest cost and with the minimum of losses occurring at each stage (White 2005)

To build an effective information system one has to understand what managers do and how they do it ([www.fao.org](http://www.fao.org)). This is because managers are involved in a complex and diverse *web of contacts* that together act as an information system. They converse with customers, competitors, colleagues, peers, secretaries, government officials, and so forth. In one sense, managers operate a network of contacts throughout the organisation and the environment.

Mintzberg suggests that managerial activities fall into 3 categories: interpersonal, information processing and decision-making. An important interpersonal role is that of figurehead for the organisation. A manager acts as a leader, attempting to motivate subordinates. Lastly, managers act as a liaison between various levels of the organisation and, within each level, among levels of the management team (Agnilar, 1967 as quoted on the [www.fao.org](http://www.fao.org).)

A second set of managerial roles, termed as informational roles, can be identified. Managers act as the nerve centre for the organisation, receiving the latest, most concrete, most up-to-date information and redistributing it to those who need to know.

A more familiar set of managerial roles is that of decisional roles. Managers act as entrepreneurs by initiating new kinds of activities; they handle disturbances arising in the organisation; they

allocate resources where they are needed in the organisation; and they mediate between groups in conflict within the organisation. (www.fao.org)

Having the needed and relevant information determines the effectiveness of a MIS. Kotler (2004) explains that information needs of the managers should be put into consideration when developing MIS. Companies study their manager's information needs and design a MIS to suit these needs. The company's MIS should represent a cross between what managers think they need, what managers really need and what is economically feasible.

An MIS whether computerised or manual should be designed to provide information from which managers can acquire maximum utility. This information should be:

- Timely; up to date: Sound decisions cannot be based on outdated information.
- Accurate: Managers must be able to rely on the accuracy of the information provided to them. Incorrect data will cause bad decisions to be made.
- Concise: Managers can absorb only so much information during any one period. Managers must limit information to only the most necessary.
- Relevant; information that managers need to know: it is important to single out only the most relevant data to analyse.
- Complete; all the information needed: A manager could draw false conclusions when basing decisions on incomplete information.

The absence of even one of the above characteristics reduces the effectiveness of the MIS and complicates the decision making process (Cravens 1996)

Marketing information system must watch the marketing environment and provide decision makers with information they should have to make the key marketing decisions.

According to Napitupulu, (1998), an internal system is the main centre of information activities in most firms making use of company information supplemented by external information, various reports regenerated for management use in planning, implementation and control activities. MIS can provide management with information on market shares, trends, advertising performance measures and socio economic analyses. The MIS is capable of providing information on an adhoc basis such as a historical market share analysis for a particular sales territory (Cravens 1996)

Kotler (2004) explains that a MIS has got four components namely internal company records, marketing intelligence activities, marketing research and marketing support decision support analysis. Hence all these components have to be addressed adequately to ensure the effectiveness of a MIS. One cannot work in isolation and they all have to work together.

Small micro enterprises (SMEs) in the tourism and hospitality sector make use of informal marketing information systems, which mainly concentrate on internal and immediate operating environment data. (Wood, Emma in [www.questionpro.com](http://www.questionpro.com))

Asaba (2007) states that provision of marketing information services and technical information addressing various farming constraints has enabled the farmers to earn better profits from their produce. Knowledge obtained from KACE centres has assisted farmers to adapt improved farming technologies that have had a spill over effect on increased yields and better quality

produce. Meuleman (2007) concludes that farmers that use KACE MIS find it easier to find buyers for their produce and can negotiate for better prices, which has led to an increase in their income.

## **2.9 Summary of literature review**

A MIS is very important to any organisation as it provides organised, timely and relevant information to the decision makers. With changing technology, a lot of high tech information systems products are coming up. These products are needed in all sectors of the economy.

In Kenya, the agricultural sector is the backbone of the economy as it contributes quite a substantial amount of money to the exchequer. However due to lack of information on prices, the farmer continues to get very low returns with most living in poverty while the brokers get more than them. Further due to lack of other relevant information, some areas continue to have surplus produce while others have deficit; farmers continue to practice poor farming methods and are not aware of new farming technologies. Previously agricultural information mostly on prices and markets was only available in the newspapers and on radio. Unfortunately few farmers have access to the newspaper.

Nevertheless, the Kenya Agricultural Commodity Exchange has come up with a marketing information system with an aim of providing information to farmers, traders and the farming community in general, provision of market linkages among others. Recent studies have shown that the KACE MIS has made great contributions to the farming community. They are now able to get into the right farming enterprises; engage in good farming practices; are in a better bargaining position and are now getting higher profits which have translated to increased livelihoods among the farmers.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter aims at defining the research design and methodology used in the study. It contains a description of the study design, target population, sample design and size, data collection instruments and method.

### **3.2 Research design**

A descriptive survey was undertaken. This was a case study of KACE and the factors that determine its MIS. Lokesh (1984) states that a case study involves an in-depth and intensive study of a limited number of representative cases.

The method was preferred as it permits gathering of data from the respondents in natural settings. Descriptive designs result in a description of the data, whether in words, pictures, charts, or tables, and whether the data analysis shows statistical relationships or is merely descriptive.

### **3.3 Population of the study**

The population of study was management staff of KACE located in all the eleven outlets countrywide (Nairobi – Brick Court House and Ukumbi wa Biashara, Bungoma, Eldoret, Kitale, Machakos, Kisii, Kisumu, Vihiga, Mumias and Siaya). The farmers based in the various areas also participated in the study.

### **3.4 Sampling design**

It would have been desirable to use a census of the whole establishment of KACE and the farmers served by the various outlets distributed countrywide, but owing to such limitations as



the long distances to be covered to each of the work stations and farms the costs that would be involved in covering them and the given time frame among other reasons, a representative sample of 18 members of staff, who represent 20% of the population was considered. In addition, at least 2 farmers were targeted in each of the outlets, making a total of 22 farmers.

### 3.4.1 Sample size

Probability sampling was used to arrive at a representative sample for the study. The respondents were sampled using stratified random sampling and then deliberately selected on the basis of convenience as perceived by the researcher. The respondents were also as representative of the various outlets and levels along the organizational hierarchy amongst other factors as possible. Foreseen constraints to be faced and the accuracy and representative ness of information to be collected determined the sampling technique, which was generally being random. Table 3.1 below presents the sample size drawn from the various target respondents.

**Table 3.1: Sample size**

No.	Strata (Outlet)	Population	Sample (20 % of population)
1	Nairobi (Brick court house)	15	3
2	Nairobi (Ukumbi wa biashara)	15	3
3	Bungoma	10	2
4	Eldoret	10	2
5	Kitale	5	1
6	Machakos	5	1
7	Kisii	5	1
8	Kisumu	10	2
9	Vihiga	5	1
10	Mumias	5	1
11	Siaya	5	1
<b>Total</b>		<b>90</b>	<b>18</b>

**Source:** Author, 2007

### **3.5 Data collection**

Both secondary and primary data were collected. Desk study was undertaken, in which a review of the relevant literature was carried out. Information pertaining to public procurement was critically reviewed. The sources of information included various websites, books, magazines, Journals and available reports from the various government ministries. The desk study enabled this research to be grounded in the current literature relating to Marketing Information Systems in Kenya. This development ensured that the research did not duplicate other studies, and instead made a significant contribution toward the subject of study.

Primary data was collected from the sampled staff of the various outlets and farmers with the aid of semi-structured undisguised questionnaires with both open ended and closed questions. The questionnaire was structured in two main sections. The first section captured the profile of the respondents whereas the second section captured pertinent issues touching on the subject of study.

The questionnaires were pre-tested on ten randomly selected respondents to enhance effectiveness and hence data validity.

The researcher hand delivered the questionnaires to the staff based in Nairobi. A letter of introduction and questionnaire was enclosed in an envelope delivered to the respondents. The staff located outside Nairobi received their questionnaires through their e-mail addresses, completed online and sent back. The farmers were reached through a research assistant in each of the outlets. In addition, the researcher made telephone calls to the respective respondents to further explain the purpose of the study and set a time frame for the completion of the questionnaires.

The researcher also conducted personal interviews with key respondents who included the managing director of KACE, the marketing officers and selected staff.

### **3.6 Data analysis and presentation**

The data was analyzed by employing descriptive statistics such as percentages, frequencies and tables. Statistical Package for Social Sciences (SPSS) was used to aid in analysis. The researcher preferred SPSS because of its ability to cover a wide range of the most common statistical and graphical data analysis and is very systematic. Computation of frequencies in tables, charts and bar graphs was used in data presentation. In addition, the researcher used standard deviations and mean scores to present information pertaining to the study objectives. The information was presented and discussed as per the objectives and research questions of the study.

## CHAPTER FOUR: FINDINGS AND DISCUSSION

### 4.1 Introduction

The study utilized a combination of both quantitative and qualitative techniques in the collection of data. The study covered all the eleven KACE offices countrywide. All the 18 questionnaires sent to staff were returned completed, giving a response rate of 100%. The high response rate could be attributed to the personal efforts of the researcher, who made a follow up of every questionnaire sent out and also the willingness of KACE staff to provide information to researchers. In addition, out of the 22 questionnaires to be completed by the farmers, 16 were returned completed, giving a response rate of 73%

The data was analyzed by employing descriptive statistics such as percentages, frequencies and tables. Statistical Package for Social Sciences (SPSS) was used to aid in analysis. The researcher preferred SPSS because of its ability to cover a wide range of the most common statistical and graphical data analysis and is very systematic. Computation of frequencies in tables, charts and bar graphs was used in data presentation. The information is presented and discussed as per the objectives and research questions of the study.

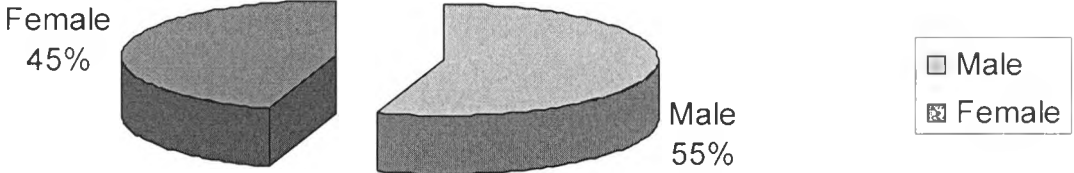
### 4.2 Profile of respondents

#### 4.2.1 *Gender distribution of respondents (Staff)*

The staff who participated in the study were asked to indicate their gender. Many organizations are embracing gender equality in their employment policies. The Government of Kenya is an equal opportunity employer and is currently encouraging employers to adopt affirmative action. In this regard, the question was meant to solicit information that would lead to an indication of gender balance in the establishment of KACE. The responses indicate 55% of the respondents were male whereas 45%

were female. The organization was gender sensitive in as far as employment is concerned.. Chart 4.1 below presents the findings.

**Chart 4.1: Gender of respondents (Staff)**



**4.2.2 Age distribution of respondents (Staff)**

The staff were asked to indicate their age bracket by ticking as appropriate against given alternative age groups. Relatively younger employees are expected to adjust easily to any changes occurring in the organization and would easily be adaptive to changes occurring in the working environment. The older employees may take long or find it difficult to adopt easily whereas the relatively younger employees tend to be more flexible. The question was meant to identify the proportion of young and aged employees in the establishment. The findings of the study are summarized in table 4.1 below.

**Table 4.1: Age distribution of respondents**

Age distribution (Years)	Frequency	Percentage
18 – 27	5	18
28 – 37	8	44
38 – 45	4	22
46 – 55	1	6
55 and above	-	-
<b>Total</b>	<b>18</b>	<b>100</b>

**Source:** Primary data

The findings indicate that none of the respondents was aged above 55 years, the latter being the mandatory retirement age. The respondents whose age is between 18 and 45 years, which is the most active work force, were 94%, an age bracket that would be supportive of the objectives of the organization.

#### 4.2.3 Academic qualifications (Staff)

The respondents were asked to indicate their academic qualifications. The higher the academic qualification, the more adaptive one was expected to be and the more supportive he/she would be to the objectives of the organization. The responses are summarized in table 4.2 below.

**Table 4.2: Academic qualifications of respondents**

Academic qualification	Frequency	Percentage
Primary education	-	-
Secondary education	2	14
College education	5	25
University education	11	61
<b>Total</b>	<b>18</b>	<b>100</b>

**Source:** Primary data

None of the respondents had primary level education as his or her highest academic qualification. Only 14% of the respondents had attained secondary education and had been employed as support staff. Those who had attained college education were 25% while 61% had attained University level education. In addition, two of the respondents had attained postgraduate qualification besides being degree holders. KACE has within its establishment staff who have the

necessary academic background that would be supportive of the organizational goals and objectives.

### **4.3 Factors that determine the development of a marketing information system**

In order to meet the three objectives of the study, various questions were posed to the two groups of respondents and key informants. The staffs were asked to indicate whether they were involved in the development of the MIS. The level of involvement of the staff would determine the objectivity of the responses to the study. All the 18 respondents were involved in the study.

The respondents were also asked to indicate the roles they played in the development of MIS.

The findings indicate that the staffs were involved to a varying degree in the various activities of MIS development.

The responses given could be summarized as follows:-

*(i) Assessing the existing information system:* In carrying out this process the staff involved seek answers to the following questions:- what is the present flow of information?; how is the information used?; and how valuable is the information in terms of decision making?

*(ii) Developing priority of needed information:* MIS must ensure provision of high priority information and data lower on the priority list should be generated only if their benefits exceed the costs of producing them. The managers interviewed indicated that each of them developed own priority lists and integrated them into a list for the entire organisation as the needs of KACE are the controlling factor.

*(iii) Develop new information system:* A system of required reports is then developed and diagrammed. The managers interviewed asserted that treating the whole organisation as a unit allows the elimination of duplicated information.

The findings further indicate that in the process of collecting information, managers tended to construct systems for collecting, recording, storing and processing information to aid in reaching their objectives with special - purpose to accounting systems, production systems, purchasing systems, filing systems and so on. The managers further noted that access to information, resources and the ability to act quickly makes it possible to accomplish more and to pass on more resources and information to subordinates.

The relatively lower cadre staffs were involved in environmental scanning, data and information collection, analysis of the data, report writing and dissemination of the information to target groups.

The staffs were asked to indicate the kind of information they collected and the frequency of collection. MIS ought to be a continuous process to ensure that information remains current and reliable to facilitate informed decision making.

All the respondents indicated that the information collection task was a continuous exercise and was done on day to day basis. The information collected covers the market prices, Environment; Markets; Industry; Competition; Distribution; and Company.

#### ***4.3.1 The factors that determine the development of MIS***

In order to meet the first objective of the study, “To identify the factors that determine development of MIS”, the respondents were asked to list the factors that drive development of MIS in KACE. These factors can be summarised as follows;-

The need to facilitate linkage between sellers and buyers of agricultural commodities in trade was the motivation towards the development of KACE MIS. This called for provision of relevant



and timely marketing information and intelligence with transparent and competitive market price discovery mechanism.

Technological developments drive the development of the KACE MIS products. With the recent developments in ICT, products such as SMS service and website are accessible in some rural areas enhancing value addition and empowerment. The challenge however is that many farmers have not bought mobile phones and the ones with the mobile phones have to travel to market centres where there is electricity for recharge.

The exploitation of farmers by market intermediaries' e.g. traders, brokers and processors led to KACE's development of MIS products. KACE took up the mandate of arming farmers with relevant and timely marketing information and intelligence to enhance their bargaining power and competitiveness in the market place.

Media coverage also determines the regional reach to farmers and traders who rely on KACE MIS. Broadcasting through KBC radio which have a wider coverage of the remote areas have been a success in reaching farmers and traders. Hewani radio in western province has enhanced regional reach.

#### ***4.3.2 The benefits derived from implementation of a Marketing Information System.***

In order to meet the second objective of the study, "To establish the benefits derived from implementation of a Marketing Information System", the researcher asked the farmers various questions.

Pertaining to awareness of KACE products, the farmers were asked to indicate the MIS products of KACE that they had heard of. This question was meant to elicit responses that would reveal

the extent to which the farmers were conversant with the various products of KACE. The findings are summarized in table 4.3 below.

***MIS Products of KACE***

The farmers were asked to indicate the MIS products of KACE that they had heard of. This question was meant to elicit responses that would reveal the extent to which the farmers were conversant with the various products of KACE. The findings are summarized in table 4.3 below.

**Table 4.3: Awareness of farmers on KACE products**

<b>KACE MIS products</b>	<b>Frequency</b>
Marketing information points	16
Marketing information centers	16
Short message services (SMS)	12
Interactive voice response (IVR)	4
Website	5
Radio- Soko Hewani	4
<b>N=16</b>	

**Source:** Primary data

The findings indicate that all the respondents had heard of marketing information points and marketing information centers, 12 had heard of Short Message Response, 5 had heard of website while 4 had heard of either Radio Soko Hewani or Interactive Voice Response. Marketing information points and marketing information centers are conveniently located in the various areas served by KACE and as such, the farmers’ awareness of their existence was high. The findings indicate that the level of farmers’ awareness of the products of KACE is high enough to guarantee objective responses.

***Type of information sought***

The farmers were asked to indicate the type of information they sought from KACE. The farmers sought various types of information from KACE and the question was meant to rank the information sought in terms of farmers' needs. The responses are summarized and presented in table 4.4 below.

**Table 4.4: Type of information sought by farmers**

<b>Information sought</b>	<b>Frequency</b>
Market information	12
Prices	16
Pests and diseases	15
Post harvest	9
New Technologies	8
<i>N=16</i>	

**Source:** Primary data

All the 16 (100%) respondents indicated that the type of information they looked for from KACE was market prices of their products. Further probing indicated that lack of access to profitable markets is the biggest problem the farmers faced and as such, KACE was perceived to be a credible source of market prices. Out of the 16 respondents, 15 of them indicated that they sought information about pests and diseases from KACE. Farmers in Kenya have continued to encounter heavy losses as a result of pests and diseases and as such, KACE was perceived to a provider of information of the same, on whose basis the farmers would take appropriate corrective actions.

The respondents that sought market information were 12. Competition is high and the farmers sought this kind of information so as to position their products competitively in the turbulent market.

Most of the farmers used traditional methods of farming, which are labor intensive. The relatively lower responses on post harvest (9) and new technologies (8) could be attributed to this.

***Type of products***

The farmers were also asked to indicate the type of products (services) of KACE they used by and reasons for usage by ticking as appropriate from listed alternatives. The responses were as follows:-

**Table 4.5: Type of KACE products used by farmers**

KACE MIS Products	Number of respondents who use the product	Reason for usage of KACE MIS Products				
		It is affordable	It is easily available	It provides all the information I want	It is easy to use	It is convenient for me
Marketing information points	16	16	12	10	15	14
Marketing information centers	16	13	15	16	14	13
Short message services (SMS)	8	5	6	3	7	8
Interactive voice response (IVR)	4	2	1	3	2	3
Website	4	4	2	3	3	4
N=16						

**Source:** Primary data

All the farmers who participated in the study indicated that they used marketing information points. These information points are conveniently located at rural market centers where farmers go to sell their produce while traders go to buy produce. A MIP serves as a source of market information and intelligence, and also as a trading floor to link buyers and sellers of commodities in a transparent and competitive manner. Information is prominently displayed on bulletin and writing boards at a MIP. The MIPs are not only affordable to the farmers, but also easily available, easy to use, convenient to the farmers and provide almost all the information sought.

Marketing information centers (MIC) were also favoured by all the 16 farmers. The MICs were established to manage and service MIPs which are located in rural market centres that do not have electrical power supply and/or fixed landline telephone service to enable internet connectivity. A MIC is established at a District Headquarter. It is equipped with ICTs: landline and mobile phones, fax and computer with email and Internet connectivity. These are most prevalent in the rural areas. The MICs are favoured by farmers because they not only provide all information sought, but are also easily available, they are easy to use, they are affordable to the farmers besides being convenient.

The farmers who owned mobile phones tended to favour the SMS, which is a text messages sent and received with mobile phones. KACE is harnessing this ICT technology to disseminate market information and intelligence. KACE has developed an SMS market information service branded as SMS Sokoni in partnership with the Safaricom Limited, a leading mobile phone service provider in Kenya. The farmers who preferred SMS indicated that it was not only convenient and easy to use, but was also easily available and affordable. SMS usage is likely to as more farmers acquire mobile telephones as a result of their falling prices.

Access to KACE website, especially by the rural based farmers was inhibited by lack of access to internet due to lack of connectivity, besides inability to use the services owing to the low levels of computer literacy.

Interactive Voice Response (IVR) service was the least favourable. KACE has, in collaboration with an IVR service provider, also developed the Kilimo Hotline, where a user calls the 0900 552 055 hotline telephone number to access market information in voice mail. Any mobile phone or digital landline can be used to call the Kilimo Hotline number. The rural based farmers hardly used the service. The scenario is, however, likely to change once the various ICT implementation initiatives are put in place, for instance the Government ICT project. The findings are presented in terms of absolute numbers in table 4.5 below.

***Extent to which the listed challenges affected farmers when seeking information from KACE***

The farmers were asked to indicate the extent to which the listed challenges affected them when seeking information from KACE. The responses are presented in table 4.6 below in terms of absolute numbers.

**Table 4.6: Problems faced by farmers in seeking information**

Problems faced in seeking information	Frequency				
	Not at all	Neutral	Somehow	Much	Very much
Distance	1	1	2	5	7
Costs	4	-	1	6	5
Relevance	6	5	3	2	-
Language barrier	6	4	1	2	3
Availability	5	6	3	1	1
N=16					

**Source:** Primary data

Out of the 16 respondents, 14 of them were at least affected by distance to the information centres. This mostly affected the farmers in rural areas, who had to either walk long distances to

access the information or use the only available means of transport, bicycles. The problem is likely to ease once the countrywide rural road network is completed.

Out Of the 16 respondents, 12 of them were affected by costs of the services provided. Though KACE charges same price for its services in the rural and urban areas, the farmers indicated that price discrimination could be practised, with rural based farmers being charged relatively lower prices. The farmers who were not affected by cost of services at all were 4, all from urban centers.

Relevance of the information does not seem to be significant information affecting the farmers as indicated 6 farmers (Not at all) and 5 farmers (Neutral) and 3 farmers (somehow).

Language barrier does not seem to be a significant problem as indicated by 6 farmers (not at all) and 4 farmers (neutral). Further probing indicated that the information was provided in both English and Kiswahili and that the KACE staffs were always willing to clarify any issues that were not well understood in their perspective. The 6 respondents who were affected by language barrier would have preferred the information to be translated in their native languages.

Eleven out of the 16 respondents indicated that availability of the information was not a problem owing to the fact that KACE utilised various modes of delivery of information and the various categories of farmers had a variety to choose from, depending on need and convenience.

The findings are also presented in the form of mean score and standard deviations in table 4.7 below.

Table 4.7: Problems faced by farmers in seeking information (Mean scores)

Problems faced in seeking information	Mean score	Standard deviation
Distance	1.342	2.683
Costs	1.294	2.588
Relevance	1.194	2.387
Language barrier	0.962	1.924
Availability	1.140	2.280
<i>N=16</i>		

Lastly, the farmers were asked to give suggestions on how these problems could be addressed. They gave various suggestions, which are summarised and presented below.

- a) Timely; up to date: Sound decisions cannot be based on outdated information.
- b) Accurate: Managers must be able to rely on the accuracy of the information provided to them. Incorrect data will cause bad decisions to be made.
- c) Concise: Managers can absorb only so much information during any one period. Managers must limit information to only the most necessary.
- d) Relevant; information that managers need to know: it is important to single out only the most relevant data to analyse.
- e) Complete; all the information needed: A manager could draw false conclusions when basing decisions on incomplete information.

The farmers were also asked to indicate the type of products (services) of KACE they used by and reasons for usage ticking as appropriate from listed alternatives. The findings are presented in terms of absolute numbers in table 4.5 below.



Further probing revealed that the farmers favoured Marketing information points, information kiosks because of their convenient location - located at rural market centres where farmers go to sell and traders to buy produce. A MIP serves as a source of market information and intelligence, and also as a trading floor to link buyers and sellers of commodities in a transparent and competitive manner. Information is prominently displayed on bulletin and writing boards at a MIP.

The farmers were also in favour of marketing information centers (MIC), which is established to manage and service MIPs which are located in rural market centres which do not have electrical power supply and/or fixed landline telephone service to enable internet connectivity. A MIC is established at a District Headquarter. It is equipped with ICTs: landline and mobile phones, fax and computer with email and Internet connectivity.

The farmers who owned mobile phones tended to favour the SMS, which is a text messages sent and received with mobile phones. KACE is harnessing this ICT technology to disseminate market information and intelligence. KACE has developed an SMS market information service branded as SMS Sokoni in partnership with the Safaricom Limited, a leading mobile phone service provider in Kenya.

Interactive Voice Response (IVR) service was the least favourable. KACE has, in collaboration with an IVR service provider, also developed the Kilimo Hotline, where a user calls the 0900 552 055 hotline telephone number to access market information in voice mail. Any mobile phone or digital landline can be used to call the Kilimo Hotline number.

Whereas farmers in the urban centers favored the website, those in the rural areas did not since connectivity is limited. Buyers do visit the website to look at the prices and availability of products.

### **Benefits derived from use of MIS**

The farmers were asked to list the benefits they derived from usage of KACE MIS products. The responses are summarized as follows:-

- (i). A MIS is very important to any organisation as it provides organised, timely and relevant information to the decision makers.
- (ii) With changing technology, a lot of high tech information systems products are coming up and are needed in all sectors of the economy.
  - (iii) It helps in improving all aspects of planning- blending all the four p's into mixes, developing and selecting plans.
  - (iv) A marketing information system can also monitor the implementation of current plans, comparing results against plans and making necessary changes more quickly, it assists in solving real marketing problems.

### ***4.3.3 Challenges that affect the development of MIS in KACE***

In order to meet the third objective of the study, “To determine the challenges which face the development and implementation of a Marketing Information System”, the staffs were asked to indicate the challenges they faced and to suggest the ways in which KACE could deal with the challenges. The findings are summarized and presented below.

If a marketing information system can be designed in such a way that the cost of the system is lowest possible, that is just what is required. There can be many avenues, such as integrating the system with the existing system of information flows, selection of the appropriate organizations for managing the system or its various roles, and partnership with other organizations for information dissemination.

Besides funding, there are other challenges, too. The findings indicate that Marketing information systems face criticisms for failing to continuously provide value adding information, reach out to grassroots communities, deliver the information timely in the remote locations, and provide more analytical and accurate information in a way that the target groups understand.

When information, such as prevalent prices in different markets, is provided to remote poor farmers, it is sometimes opposed by some traders who can otherwise benefit from blocking the information. Nevertheless, while designing a marketing information system, one always has to weigh the costs and benefits, and has to make difficult decisions on what contents to include, what markets to cover, what products to prioritize, how often to collect and disseminate the information, what level of market analysis to execute; and most importantly whom to target and how to timely reach the target groups with useful information to them.

Ways of reducing the costs of marketing information systems should be explored so that it can be cost effective and sustainable. The cost of MIS can be reduced if the options, such as building the MIS on the existing system of information flow, selection of the appropriate organizations

for MIS roles, and partnership with various organizations for information dissemination, can be fully utilized.

Unlike the MIS of private companies who disclose prices and other information as an offer to the suppliers, the marketing information provided by MIS projects is just an indicative price for the given time. Often times, farmers, local entrepreneurs, and local traders have raised questions on accuracy and reliability of the information. The time lag between information collection and information reach to the users has also become an important challenge for MIS manager

There is not enough data on the social and economic benefit of improved communication and information to poorer farmers to encourage and justify public investment. More work is urgently needed to explore this issue to develop a new consensus on who should pay for information for poorer people.

The staffs were of the view that inadequate markets and marketing infrastructure have been quoted as some of the constraints to agricultural development. This is because agricultural marketing information and infrastructure are poorly organized and institutionalised.

The domestic market is also small and lacks an effective marketing information system and infrastructure. The dependence on a few external market outlets makes agricultural exports very vulnerable to changes in the demand for agricultural products and unexpected imposition as non-trade barriers (NTBs) by foreign markets.

In giving suggestions for improvement, the respondents were of the view that the integration of a process-fitting combination of the technologies into business environments of agriculture and the food industry requires cooperation in various dimensions:-

(i). It requires cooperation between different areas of competence as, e.g., competence in

information technology or competence in business and market management. The competence cooperation requirement is one of the main obstacles in the development and implementation of appropriate concepts for IT support in agri-food trade.

(ii). It requires cooperation between groups of enterprises from all stages of the food supply chain, extension organizations, market organizations, and other related services to make decisions regarding, among others, the organization of communication processes in market activities, the communication content, the delivery technology (multi-media alternatives) or the portal infrastructure.

(iii). It requires cooperation between the providers of IT technologies and services to secure the technical feasibility and efficiency of digital integration and to adapt technology to content.

(iv) It requires cooperation among small-scale enterprises, especially farmers, to be able to utilize the emerging digital environments and to open opportunities for virtual cooperation.

(v). It requires cooperation between users, researchers, extension workers and system designers to arrive at applications which best fit the operational needs of users.

(vi). It requires cooperation in the development of system marketing strategies and the development and implementation of training opportunities.

The farmers were also asked to indicate the extent to which the listed challenges affected them when seeking information from KACE. The responses are presented in table 4.6 below in terms of absolute numbers.

## CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Summary of findings of the study

The key components of marketing information system include information collection, analysis, and dissemination. Most of the marketing information systems have established linkages with other organizations and have subscribed to relevant published documents like journal, newspapers, and website to collect information. Most of the marketing information systems have used multiple sources of information, a range of analysis, and various media to deliver useful information to the target clients. The large scale marketing information systems have developed sophisticated database and have heavily used ICT to collect, analyze and disseminate the information. In general, there is a growing trend of using ICT to strengthen the marketing information systems.

MIS is developed in order to:-

- (i). facilitate linkage between sellers and buyers of agricultural commodities, provide relevant and timely marketing information and intelligence, provide a transparent and competitive market price discovery mechanism.
- (ii). facilitate linkages between sellers and buyers, exporters and importers of agricultural commodities in trade
- (iii). provide farmers and market intermediaries (traders, brokers, processors and consumers) with relevant and timely marketing information and intelligence, and other services that enhance their bargaining power and competitiveness in the market place;

(iv). harness and apply the power of information and communication technologies (ICTs) as a strategic tool for rural value addition and empowerment.

The study shows that when it is in line with their business strategies, private companies can also run MIS, which equally benefits poor farmers and can have a high chance of becoming successful and sustainable. However, the information quality and its usefulness to the users need to be continuously assessed and improved. Besides, member based organizations are also found most appropriate to manage marketing information systems. They may have to offer marketing information services to their members in exchange of the membership fee and members' support.

The marketing information systems have tried different approaches to fund the costs of the system. Some of the ways of recovering costs tried by some marketing information systems include membership fee, specialized information access fee, price for market research and customized services, sales of publications, advertisements on publications and websites, sponsorship of events, commission on sales through the system, funds from government, and cost sharing mechanism with development organizations and users.

## **5.2 Conclusions**

In this age of technology it is very difficult to compete in any form of business undertaking if one is not up to date with technological advancement. For example today to do business effectively one needs an email address and good access to Internet, phone etc. Therefore the need for MIS in improving the livelihoods of rural population cannot be over emphasized.

Engagement of the rural young people in agriculture with full utilization of MIS will improve their livelihoods eventually reducing poverty levels. MIS will assist the rural based small scale farmers and entrepreneurs to enter the mainstream economy (access to the global market) and become sustainable exporters contributing to economic growth. With the envisaged high productivity and increased income more jobs will be created in the rural areas through on farm employment and rural entrepreneurship. All in all MIS will ensure that imbalances in terms of market accessibility and information are addressed.

However the government should play its part in terms of good policies, by ensuring that MIS are accessible and affordable in rural areas so as to meet their information needs in agriculture and agribusiness. The MIS will reduce the information gap that currently lies between the farmers and the potential markets. There is therefore need to assist build local capacity among farmers to support Internet connectivity.

Ways of reducing the costs of marketing information systems should be explored so that it can be cost effective and sustainable. The cost of MIS can be reduced if the options, such as building the MIS on the existing system of information flow, selection of the appropriate organizations for MIS roles, and partnership with various organizations for information dissemination, can be fully utilized.

Besides funding, there are other challenges, too. Marketing information systems face criticisms for failing to continuously provide value adding information, reach out to grassroots communities, deliver the information timely in the remote locations, and provide more analytical



and accurate information in a way that the target groups understand. When information, such as prevalent prices in different markets, is provided to remote poor farmers, it is sometimes opposed by some traders who can otherwise benefit from blocking the information. Nevertheless, while designing a marketing information system, one always has to weigh the costs and benefits, and has to make difficult decisions on what contents to include, what markets to cover, what products to prioritize, how often to collect and disseminate the information, what level of market analysis to executive; and most importantly whom to target and how to timely reach the target groups with useful information to them.

Besides the MIS of private companies who disclose prices and other information as an offer to the suppliers, the marketing information provided by MIS projects is just an indicative price for the given time. Often times, farmers, local entrepreneurs, and local traders have raised questions on accuracy and reliability of the information. The time lag between information collection and information reach to the users has also become an important challenge for MIS manager

There is limited data on the social and economic benefit of improved communication and information to poorer farmers to encourage and justify public investment. More work is urgently needed to explore this issue to develop a new consensus on who should pay for information for poorer people.

### **5.3 Limitations of the study**

Notwithstanding the researcher's determination to undertake the study to completion within the given time frame, various constraints were encountered. For instance, some of the information

sought was of a confidential nature, which the respondents either deliberately refused to divulge or did not have access to. In addition, the time allocated to data collection was not sufficient to enable the respondents complete the questionnaires as accurately as possible, considering that they were at the same time carrying out their daily duties.

Though the researcher preferred to administer the data collection tools to only the sampled staff, it was not possible as some of them had to delegate to their juniors, they themselves either being too busy or away on official duties. The same applied to the sampled farmers, some of whom were too busy and had to delegate to their workers. It is thus assumed that the respondents were able to give similar information as would have been provided by the originally sampled staff.

It is also quite difficult to measure aspirations and expectations resulting from answers from respondents. Owing to the nature of work undertaken by the respondents some of the responses could be inaccurate due to divided attention.

## **5.4 Recommendations of the study**

### ***5.4.1 Recommendations for policy and practice***

Based on findings of the study, it is expected that the stakeholders, who include the management of KACE and the farmers will gain a better understanding of the factors that determine the development of a Marketing Information System, challenges emanating from implementation of the same and their effects to service delivery. The researcher thus makes the following recommendations:-

***Ensure equitable access:*** There is substantial evidence that if new information systems do not reach the poor, they may exacerbate existing social, ethnic, gender, economic and political

disparities. Television and radio are more widely accessible than the internet, especially in Africa. There are however good examples in Africa and Asia where telecentres, internet-linked rural community radio and electronic information services, specifically designed to ensure access by the poor, have had positive livelihoods and governance outcomes. The challenge is to apply these pilot approaches more widely to enable rural communities, and their governments, to manage information more effectively, and to ensure information is also integrated into, accessible and complements more conventional media such as radio, television and face-to-face communication.

**Promote local content:** Rural communities trust internal and local information more than external information, and are unlikely to adopt external solutions without substantial discussion of locally specific examples. Improved access to locally-relevant information is essential for poverty reduction. Farmers and their communities need information on local agro-ecological conditions, weather and topography, local cultural and economic aspects of production, marketing and processing, and non-agricultural information on topics including health, education and governance. Supporting communication between local institutions may be more important than providing new content from external sources. Internet technologies provide enormous opportunities to share information locally, and to enrich local, national and international information systems with specialized local knowledge, although this requires both a detailed understanding of the local context and a sophisticated capacity to tailor information appropriately for both local and national or international audiences.

**Build on existing systems:** Many information systems are overly ambitious and complex, and over-designed. They tend to overlook the fundamental organizational processes and institutional

incentives that encourage people to use them. Experience shows that the most effective systems are simple and modest, and build on existing databases and data collecting routines to provide specific information to specific users to inform decisions for which they are accountable. There are good examples of innovative mechanisms to bring information from both the internet and rural areas through rural radio, or village internet booths run by local people, and these systems are often designed to meet the specific demand for the communities they serve.

***Build capacity:*** There is a critical need to build capacity at all levels. Intergovernmental agencies need this to work on international information technology infrastructure, policies and standards. International and bilateral agencies need capacity to help governments build partnerships with the private sector to develop national information systems and strategies which support the implementation of national pro-poor policy. Local capacity in information collection, storage and dissemination needs to be enhanced in order to bridge the gap between information providers and users. Education leading to basic literacy and numeracy, especially for marginalized groups, is key to improving local capacity to be able to access and generate information. Improved knowledge and skills in governance and enterprise are vital if poor people are to be able to capitalize on an increasingly decentralized, globalize world.

***Use realistic technologies:*** Information and communication initiatives for development are expanding exponentially. Most promote the latest technology leading to a perpetual race to keep up. The emphasis should be on developing a realistic set of compatible technologies to facilitate the exchange of information between different systems. There is also little effective monitoring and evaluation of information initiatives, making it difficult to even identify the key lessons. It is essential to be more realistic about information technology. In developing countries the most

sustainable approach is to use a combination of, and link, the old and the new technologies.

***Build knowledge partnerships:*** There are many good examples of traditional systems that share information between organisations at the same level. For instance, research institutes or farmer organisations, and systems that share information between organisations at different levels. Different tiers of government, or national research institutes and local extension agencies, but few that can do both.

The new “network” age allows much more flexible approaches, in which dynamic “knowledge partnerships” can be established between individuals and organisations at any level. Multidisciplinary knowledge partnerships that can develop mechanisms to deal with the problems of connectivity and information literacy at community level, and link with national and international systems offer the potential for a dynamic two-way flow of information at every level.

#### ***5.4.1 Recommended areas of further research***

The findings of this study, it is hoped, will contribute to the existing body of knowledge and form basis for future researches. The following areas of research are thus suggested: - (1) Whereas the current study focused on responses from the management of the Kenya Agricultural Commodity Exchange Limited, future studies should focus on responses from the farmers; and (2) Future studies should seek to establish the nature, extent and adoption profile of Marketing Information System in Kenya; and Findings of the study should be replicated to other sectors of the economy.

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[www.questionpro.com](http://www.questionpro.com)



**APPENDIX I: INTRODUCTION LETTER TO THE RESPONDENTS**

**UNIVERSITY OF NAIROBI  
SCHOOL OF BUSINESS  
DEPARTMENT OF BUSINESS  
ADMINISTRATION  
P.O.BOX 30197, NAIROBI**

**August 2007**

**Dear Respondent,**

**RE: COLLECTION OF RESEARCH DATA**

I am a postgraduate student at the University of Nairobi, School of Business. In order to fulfill the degree requirement, I am undertaking a management research project titled: A marketing Information System: The case of the Kenya Agricultural Commodity Exchange.

You have been selected to form part of this study. This is kindly to request you to fill the attached questionnaire. The information you give will be used purely for academic purposes and will be treated with strict confidence. A copy of the final report can be made available to you upon request.

I thank you for your assistance.

**Yours faithfully,**

.....

**Prisca Githuka  
MBA Student**

**University of Nairobi**

.....

**Jeremiah Kagwe  
Lecturer/Project Supervisor**

**University of Nairobi**

## APPENDIX II: QUESTIONNAIRE (Staff of KACE)

This questionnaire has been designed to collect information from KACE staff located countrywide and is meant for academic purposes only. The questionnaire is divided into two sections. Section I seeks to capture the profile of respondents while section II will capture issues pertaining to the area of study. Please complete each section as instructed. Do not write your name or any other form of identification on the questionnaire. All the information in this questionnaire will be treated in confidence.

### SECTION I: BACKGROUND INFORMATION

1. Indicate your gender? (Please tick as appropriate)
  - (a) Male
  - (b) Female
  
2. Indicate your age group (Please tick as appropriate)
  - (a) 18–27 years
  - (b) 28 - 37 years
  - (c) 38 - 45 years
  - (d) 46–55 years
  - (e) 55 years and above
  
3. Indicate your highest academic qualification?
  - (a) Primary education
  - (b) Secondary education
  - (c) College education
  - (d) University education
  - (E). Any other please specify.....
  
4. For how long have you worked in KACE ? (Please tick as appropriate)
  - (a) Less than 2 years
  - (b) 2 to 4 years
  - (c) 4 to 6 years
  - (d) 6 years and above

### SECTION II: DEVELOPMENT OF MIS

5. Are you involved in the development of MIS? (Tick where appropriate)  
Yes  No
  
6. If yes, briefly explain your role in MIS development?

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7. Which kind of information do you collect?

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8. How do you collect information and how frequent do you do it?

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9. Which factors drive your organization in development of MIS?

10.. Please list and briefly explain the challenges that affect the development of MIS in KACE.

11. Please suggest the ways in which KACE can deal with the challenges listed in (10) above.

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**THANK YOU**

### APPENDIX III: QUESTIONNAIRE (Farmers)

This questionnaire has been designed to collect information from KACE clients located countrywide and is meant for academic purposes only. The questionnaire is divided into two sections. Section I seeks to capture the profile of respondents while section II will capture issues pertaining to the area of study. Please complete each section as instructed. Do not write your name or any other form of identification on the questionnaire. All the information in this questionnaire will be treated in confidence.

1. Out of the following services offered by KACE, which ones have you heard about?

<b>KACE MIS products</b>	<b>Tick as appropriate</b>
Marketing information points	
Marketing information centers	
Short message services (SMS)	
Interactive voice response (IVR)	
Website	
Radio- soko hewani	
Others (please specify)	

2. Which kind of information do you seek?

<b>Information sought</b>	<b>Tick as appropriate</b>
Market information	
Prices	
Pests and diseases	
Post harvest	
New Technologies	
Others (please specify)	

3. Please indicate the products (services) of KACE you use and reasons for usage (Tick where appropriate)

KACE MIS Products	Reason for usage of KACE MIS Products				
	It is affordable	It is easily available	It provides all the information I want	It is easy to use	It is convenient for me
Marketing information points					
Marketing information centers					
Short message services (SMS)					
Interactive voice response (IVR)					
Website					

4. Please indicate the benefits you get from the MIS products of KACE that you use

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5. Indicate the extent to which the listed challenges affect you when seeking information from KACE. (Please tick as appropriate)

Problems faced in seeking information	Not at all	Neutral	Somehow	Much	Very much
Distance					
Costs					
Relevance					
Language barrier					
Availability					
Others (please specify)					

6. Please give any suggestions on how these problems can be addressed?

**THANK YOU**