

**SUSTAINABILITY STRATEGIES ADOPTED BY
KENYA AGRICULTURAL RESEARCH INSTITUTE**

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**A Management Research Project Submitted in Partial
Fulfillment for the Award of the Degree of Master of
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DECLARATION

This project is my original work and has not been submitted for a degree in any other university.

Signed 

Date 10th Nov. 2006

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This project has been submitted for examination with my approval as the supervisor.

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DEDICATION

This project is dedicated to my late twin brother Lincoln Njagi Gicobi, rest in peace bro, this one is for you.

ACKNOWLEDGEMENT

I am deeply indebted to all those people who in their own individual contribution made this project a success and sincerely and wholeheartedly thank them all. Though I can not name them all here I remain grateful for their support.

First and foremost is my gratitude to the almighty God, our protector who makes all things happen. This was all in his plans.

Special thanks go to my supervisor Mr. Jackson Maalu who patiently guided me throughout the project even when I seemed to lose focus he never got tired of guiding me.

Special thanks also go to my employer Kenya Agricultural Research Institute (KARI) for allowing me time to study and their continued support during the study period. Sincere thanks also go to the senior managers who granted me time for the insightful interviews and contributed immensely with their intimate knowledge of the institute.

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ABSTRACT

Sustainability is a concept that has gained prominence in the environment and natural resource management fields but in management is less heard of and practiced. While it has the general understanding of leaving to the future generation opportunities the management orientation looks at the organization ability to provide inter-generational creation of value and looks at the links an organization has with external and internal environment.

This study was carried out by carrying out in depth interviews with Kenya Agricultural Research Institute (KARI) senior staff. The study intended to look at how KARI has tried to achieve sustainability now that there is widespread acknowledgement of the pitfalls of depending on external resources.

Generally public sector organizations have depended on funds from the government and for public sector research organizations, donors have played a vital role in their day to day operations. However, changes in the external environment caused by the government's reduction in their budgetary support and donors shifting of their financing interests have caused a reduction in the availability of resources. Moreover, the provision of public goods has complex supply-demand dynamics, the researcher set out to look at whether KARI is trying to achieve organizational and financial sustainability and the challenges they are facing in their quest to achieve this objective.

The study established that KARI has embarked on the process of achieving sustainability. Faced with difficulties in meeting their budgetary requirements and unable to predict with certainty if their resources would be forthcoming and at the same time required to continue providing the services as they were required, KARI set up a department, Agricultural Research Investment Services (ARIS). This department is to spearhead efforts to improve internal revenue generation through commercialization activities and consultancy services. Intellectual property rights enforcement is another option being explored together with setting up of an endowment fund.

A decentralization in asset maintenance policy was in place to ensure present assets were utilized and maintained well, measures to secure land ownership that had been lost and poised a threat to KARI's land needs were being implemented while the Kenya Agricultural Productivity Programme (KAPP), a 15-20 year agricultural research programme being implemented was to ensure building of new office blocks and laboratories in centres that have old buildings. A human resource strategy was being implemented to achieve sustainable and strategic human resource reflective of KARI's future needs while stakeholder relationships were embodied in KARI's strategic plans and nurtured through consultations, collaborations, discussions, Memorandum of Understanding (MOU's) and through Centre Research Advisory Committees (CRAC's). Clearly KARI has systematically instituted strategies to maintain their most important assets and at the same time is working to ensure in future, financial autonomy is achieved.

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LIST OF ABBREVIATION

ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ARIS	Agricultural Research Investment Services
CGIAR	Consultative Group on International Agricultural Research
DFID	UK Department for International Development
EU	European Union
GOK	Government of Kenya
GoN	Government of Netherlands
ICIPE	International Centre on Insect and Plant
IDA	International Development Association (The World Bank)
IDRC	International Development Research Centre
ILRI	International Livestock Research Institute
ISNAR	International Services for National Agriculture Research
KAPP	Kenya Agricultural Productivity Programme
KARI	Kenya Agricultural Research Institute
OECD	Organization of Economic Co-operation and Development.
NARP	National Agricultural Research Project
USAID	United States Agency for International Development

CHAPTER 1: INTRODUCTION

1.1 Background

Firms of all sizes need strategies in order to be successful and sustainable (David, 2001) or as Koigi (2002) puts it, to succeed in achieving their goals, organizations need to formulate and implement strategies. This also applies to public sector organizations, although they operate differently from profit making organizations, they face challenges and are open systems and made up of groups of people managing limited resources in the pursuit of identifiable goals (Njoya, 2004).

Strategies may be thought of as a pattern of purposes, policies, programs, actions, decisions and/or resource allocations that define what an organization is, what it does and why it does it (Dereli, 2003). He adds that validity of strategy lies not in its clarity but in its capacity to capture the initiative, deal with the unknowable events, to redeploy and concentrate resources as new opportunities and threats emerge and thus to use resources most effectively towards selected goals.

Johnson and Scholes (2002) define strategy as "the direction and scope of an organization over the long term, which achieves advantage for the organization through its configuration of resources within a changing environment to meet the needs of markets and fulfill stakeholder expectations". Hax and Majluf (1991) on the other hand view strategy as a multidimensional concept that embraces all of the critical activities of the firm, providing it with a sense of unity, direction and purpose as well as facilitating the

necessary changes induced by the environment. They (Hax and Majluf) conclude that strategy is a fundamental framework through which an organization asserts its vital continuity, while at the same time facilitating its adaptation to a changing environment. The essence of strategy thus becomes the purposeful management of change toward the achievement of competitive advantage in every business in which the firm is engaged in. There is also a formal recognition that the recipients of the firm's actions are the wide constituency of stakeholders.

The strategies chosen for implementation depend on factors such as leadership, resource availability to the firm and changes in the environment (Koigi, 2002). Thompson and Strickland (1998) observe that the managerial task of implementing the chosen strategy entails assessing what it will take to make the strategy work and reach the targeted performance on schedule. The management skill here being good at figuring out what must be done to put the strategy in place, execute it proficiently and provide good results.

Aosa (1992) notes that the strategy being implemented should be realistic given the resources available; or as Thompson, 1990; and Tregoe & Tobias, 1991 in Aosa (1992) points out, it is impossible to implement a strategy which imposes resource requirements that cannot be met by the firm. Banerjee (1990) says that it's important for any organization to pursue strategies that it is capable of sustaining. Capacity for such sustainment is a measure of organizations strategic capability and the wherewithal for this is provided by the resources that are at the disposal of the organization (Banerjee, 1990;

Johnson & Scholes, 2002). Those resources are deployed into the activities of the organization to create competences.

1.1.1 Concept of Sustainability

Sustainability implies the long-term continuation of an organization, programme or project. Sustainability of organizations, projects or programmes needs to be understood in terms of several elements or components without exclusive focus on any single element and it is important to judge these components on their ability to stand on their own feet.

The concept of sustainability has financial and institutional dimension (Njoya, 2004). Banerjee (1999) shows that, there are broad issues of resource capability which are relevant to the organization as a whole and these are largely concerned with the overall balance of resources. Njoya (2004) argue further that sustainability is more than financial since the impact of the work has to be sustained in the long run. Sustainability thus cuts across several aspects of an organization and essentially entails resource possession or control, utilization and configuration towards organizational goals. These resources include physical, financial, human, intellectual, marketing, research and development, information and manufacturing (Banerjee, 1999; Johnson & Scholes 2002). Johnson & Scholes (2002) shows that organizational resources include those that are owned by the organization and those that can be accessed to support its strategies. This is because some strategically important resources maybe outside an organization's ownership, such as its network of contacts or customers.

On the face of it, sustainability is difficult to quantify, it requires a long-term view of the institutional development process and implies the long-term continuation of an organization, programme or project. It suggests an organization's ability to perform after the external support or technical assistance has been withdrawn and especially for donor funded projects or institutions (McGill, 1994). Sustainability can be seen especially among fully functioning organizations, having diversified resource base and partnership relationships with national and international networks.

1.1.2 Background on Kenya Agricultural Research Institute (KARI)

KARI was established in 1979 as a semi-autonomous government institution through the amendment of the Science and Technology Act Cap 250, following the collapse of the East African Community in 1977. The new institute took over research activities from the East African Agricultural and Forestry Research Organization (EAAFRO), East African Veterinary Research Organization (EAAVRO) and later the Ministries of Agriculture and Livestock Development. More recently, the Kenya Veterinary Vaccines Production Institute (KEVEVAPI) and the Kenya Tripanosomiasis Research Institute (KETRI) have been integrated into KARI to further strengthen agricultural research system and to create an institutional framework to effectively manage, reorganize and consolidate agricultural research within the country.

The Act that set up KARI gave it a mandate to carry out agricultural research on all aspects of crops and livestock with the exception of coffee, tea, sugar, fisheries, forestry and the research activities of universities and the private sector. KARI is a parastatal with

its own Board of Management and is answerable to the Ministry of Agriculture budgetary wise and policy wise.

Agricultural research is often considered a public good and because its benefits in many instances cannot be appropriated by the scientists (or organizations) doing the work, there is usually little incentive for an individual to undertake research, but it makes an important contribution to economic development especially in countries such as Kenya where agriculture is a major sector of the economy.

Agricultural research as an investment requires large initial financial outlays whose returns are not immediately apparent, but has been shown to generate significant positive returns (Nyangito, 1998; Waithaka *et al.*, 2004), benefiting society as a whole and providing diverse linkages to the other sectors of the economy (Weijenberg *et al.*, 1995). In their study of selected African countries including Kenya, Oehmke & Crawford (1993, 1996) in Waithaka *et al.* (2004) revealed significant positive returns to investments for selected crops as high as 135% and as low as 2%. Sanders (1993) in Weijenberg *et al.* (1995) reported rates of return of 22 percent for similar efforts for sorghum in Sudan and 74 percent for maize in Ghana. In KARI an impact assessment study of research projects financed under the Agricultural Research Fund looked at 32 completed projects and assessed 7 out of these in detail, the average rate of return resulting from these technologies was 158 KES for every KES invested in the research (MTP III, 2002).

KARI's research programmes are planned on a long-term basis (15-20 years) under the National Agricultural Research Project (NARP). NARP forms the basis for financial and technical support by the Government of Kenya and various donors mainly the World Bank (IDA), EU, USAID, CoN, DFID-UK, Rockefeller Foundation among others. The total annual contribution to KARI from all sources is in the region 15 million US Dollars (Njagi et al 2001).

All organizations require funds to operate and implement their strategic plans and KARI is no exception. KARI's main sources of funds are the government, development partners and internal revenues. Government provides funds for personnel emoluments and for recurrent operational costs (KARI, 2005; Waithaka et al, 2004). While much of the research work is funded by multilateral and bilateral donors, the funds being assessed either through institutional proposals or scientists proposals (KARI, 2005).

Both of these sources have attendant problems. Government's allocations are slashed every year making it difficult for KARI to plan in the long term and the quarterly financial controls make it impossible to use this source of funding for research which requires a continuous flow of funds. On the other hand multilateral funding agencies have strict policies and conditions for the lending and provision of grants (Akroyd et al. 2004). Donor funds have high transaction costs for the research institutes, bring about loss of control of the research agenda, unbalanced incentive systems, loss of coherence in internal budgetary accounting, uncertainties in long-term planning and leads to fragmentation and lack of continuity in research efforts (Waithaka et al, 2004).

KARI also utilizes its internal revenue which arises mainly from sale of products of research activities, consultancies and charges for laboratory services. It also derives revenues from sale of basic and pre-basic seeds to registered seed companies and its improving its revenue collection from royalties from its technologies and sale of vaccines.

1.2 Statement of the Problem

Investment in agricultural research has been shown to produce significant positive returns to investments (Oehmke & Crawford, 1993, 1996 in Waithaka et al, 2004), but as an investment, requires large initial financial outlays whose returns are not immediately apparent (Nyangito, 1998).

For KARI, government funds cater for personnel emoluments and recurrent operational costs only (KARI, 2005) rendering the institute highly dependent on funds from development partners, a phenomenon that is acknowledged to be unsustainable (KARI, 1995, 2003, 2005; GoK, 2004, 2005; Akroyd et al, 2004; Njagi et al, 2001; Weijenberg et al, 1995; Pardey & Roseboom, 1998).

KARI has immense physical infrastructure and human capacity but lack of funds still remains its major constraint to implement most of its strategies, and the research and development activities (GoK, 2004; Njagi et al, 2001). Even at project formulation stage, it is usually not certain that funds will be available to execute priority research projects.

The level of GoK allocation and donor financial support remains uncertain even during the implementation of already approved projects (KARI, 1995).

Government funding is difficult for KARI to use it in planning for the long term as its amount is unpredictable every year and the quarterly financial controls make it impossible for funding research as it requires a continuous flow of funds (Akroyd et al, 2004) while donor funds bring about uncertainties in long-term planning and leads to fragmentation and lack of continuity in research efforts (Waithaka et al, 2004).

Other studies have looked at the public sector as a whole (Karanja, 2004) while Koske, (2003) looked at Telkom Kenya Ltd. Njoya's (2004) study looked at resource mobilization in a non profit organization. Aosa (1992) recommended further studies in the public sector companies and with a narrower focus to achieve greater depth. Nyiira, (1991) in a survey of 5 countries on research resources in national research institutions recommended a similar but indepth study to be extended to other countries in the region and if possible to each and every Research and Development institution.

This study attempts to look at the sustainability strategies instituted by KARI in accessing resources and availing them to the scientists in adequate amount and at the right time to facilitate timely and efficient implementation of approved programmes and projects, free from vulnerabilities associated with different sources.

1.3 Objectives of the Study

The objectives of this study were:

1. To establish the sustainability strategies adopted by KARI to achieve financial and organizational sustainability.
2. The challenges encountered in implementing the sustainability strategies.

1.4 Importance of the Study

This study will be very important to KARI's management who have recognized the problem and the need to address it, and its staff a greater understanding of the bigger picture facing the institute. KARI is a strategic parastatal whose work is important to this country whose economy is dependent on agriculture.

The study will also be useful to other parastatals especially with the present government requirement of financial independence of parastatals.

For the government it will be of great importance, as the chief allocator of scarce resources, an in-depth study will give it a more informed approach in the management of scarce resources.

To the academic community, the study will add to the body of knowledge in strategic management over and above the generalizations present with the theories and also add to

the body of knowledge related to Africa and Kenya in relation to the practice of management being a field that is affected by the environment.

CHAPTER 2: LITERATURE REVIEW

2.1 Organizational Capability

Firms differ based on organizational capabilities (Barney, 1991; Dierickx and Cool, 1989; Hansen and Wernerfelt, 1989 in O'Regan & Ghobadian, 2004), and these capabilities are used to "create and exploit external opportunities and develop sustained advantages" (Lengnick-Hall and Wolff, 1999 in O'Regan & Ghobadian, 2004). O'Regan & Ghobadian (2004) further observes that study by authors like Henderson & Cockburn, 1994; McGrath *et al.*, 1995 reveals that capabilities are firm-specific and developed within the firm rather than acquired externally. Arguably, the development of unique capabilities enables firms to perform processes better and in a "different manner" compared with other firms.

A central premise in the resource-based perspective holds that firm resources and capabilities can form the basis of competitive advantage if characterized by the properties of heterogeneous distribution among industry participants, imperfect mobility, and protection from competition (Barney, 1991; Dierickx and Cool, 1989; Lippman and Rumelt, 1982; in Spanos & Prastacos, 2004).

It is important to note that in the early contributions there was no explicit distinction between resources and capabilities (Spanos & Prastacos, 2004). Amit and Schoemaker (1993) in Spanos & Prastacos, (2004), view resources as assets that are either owned or

controlled by a firm, whereas capabilities refer to its ability to exploit and combine resources, through organizational routines, in order to accomplish its targets.

O'Regan & Ghobadian (2004) observe that organization capability is a broad concept with many elements and attributes. They (O'Regan & Ghobadian, 2004) quote several authors definitions and understanding of the concept. These include an early generic description by Nelson and Winter (1982) that categorizes capabilities as lower-order organizational knowledge and skills, and higher-order coordinating mechanisms; Madhok (1997) refers to capabilities as a combination of resources that creates higher-order competencies while Chandler (1990) defines organizational capabilities as a firm's collective physical facilities and skills of employees, and in particular, the abilities and expertise of the top management layers. On the other hand Hoskisson *et al.* (2004) referred to capabilities as: "the capacity to perform a task or activity in an integrated manner" while Teece *et al.*, 1997 saw organizational capabilities as a firm's capacity to deploy its assets, tangible or intangible, to perform a task or activity to improve performance.

An analysis of the definitions outlined suggests that organizational capabilities include the firm's capacity for undertaking, through its employees, a particular productive activity. This definition encapsulates the descriptions outlined:

"An organizational capability refers to an organizational ability to perform a coordinated task, utilizing organizational resources, for the purpose of achieving a particular end result".

Spanos & Prastacos, (2004) opines that it's important to note that knowledge and human actors are the basic "building blocks" of organizational capability as they refer to the capacity of the firm to deploy existing resources to perform some task or activity, and at the same time are invisible, knowledge-based phenomena. Moreover, they are developed over time and nurtured through complex interactions among organizational members.

Mrinalini & Nath (2000) on the other hand observed that an organization's growth depends upon its ability to generate knowledge from information, a fact that fits well in the case of a research organization, whose main function is to generate and market knowledge. To generate this knowledge base the organization should have the ability to access, process and utilize information for knowledge generation. This ability is embodied in human beings, and by making use of the physical resources it is possible for the people in an organization to access, process and utilize information for knowledge generation. What an organization can do is provide the domain for enhancement, expression and sustainability of this human embodied knowledge base so that it becomes a resource. Through the organizational process of transformation an individual's ability is converted into an organizational resource. Individuals then become human resources that can be related to organizational goals

Resources therefore play a big role in the whole concept of organizational capability. For them to be deployed they have to be present or a means of obtaining them be clear for an

organization to achieve its goals, for the organization to meet its customers needs and its here that the human knowledge becomes important.

It's appropriate to note that resource availability and resource utilization are not in themselves sufficient. It's how effective the available resources are utilized that is critical. There is need to develop national capacities to develop to integrate and coordinate such support and focus it to institution-building (Nyiira, 1991)

A related concept is what Johnson & Scholes (2002) refer to as strategic capability, the ability to perform at the level required for success which is underpinned by the resources and competences of the organization. They observe that its resources that are deployed into the activities of the organization to create competences. Threshold level of resources are the resources needed to support particular strategies. some organization might have inadequate resources and be unable to meet customers threshold requirements (Johnson & Scholes, 2002). Typical resources include physical resources, human resources, financial resources and intellectual capital.

2.2 Organizational Sustainability

Sustainability is today one of the most widely used words in the scientific field as a whole and in the environmental sciences in particular with the "word" sustainability being traditionally used as synonymous with words such as "long-term", "durable", "sound" or "systematic", among others (Filho, 2000). Webster's dictionary uses the

adjective sustainable to describe something that can be kept up, prolonged, or borne for a long time.

For fiscal sustainability, economists view the concept of sustainability as being related to solvency, the ability to service debt obligations or the governments ability to indefinitely maintain the same set of policies while remaining solvent (Burnside, 2005). In the health sector, sustainability refers to the availability of and access to health care services on a regular and sustained basis. i.e. the scheme being in a position to meet all its financial and infrastructural obligations as it addresses the health care needs of the beneficiaries. On the other hand, sustainability when looked at from the development angle implies a new concept of economic growth, one that provides fairness and opportunities for all the worlds people, not just the privileged few, without further destroying the world's finite natural resources and carrying capacity.

From strategic management and organizations context, the sustainability concept is hard to define. It's a concept that has not really gained prominence. A businessman might say his company is sustainable if it can generate enough cash flow from sales to cover its operational budget and replace its declining capital without subsidy. This is useful but it does not explain how to achieve sustainability (Ellsworth, 1998). Serageldin (1996) in Ellsworth (1998) says that "sustainability is to leave to future generations as many opportunities as we ourselves have had, if not more". This defines the concept of sustainability itself and leads to consideration of inter-generational issues. Foundation donors consider an organization to be sustainable if it has diverse funding sources, so that

if one or two left the scene, no great harm would be done to the organization's capacity to continue its work (Court, 1988; in Ellsworth, 1998).

Brinkerhoff and Goldsmith (1990) in Ellsworth (1998) propose that organizational sustainability "is the ability of an organization to produce outputs that are sufficiently well valued so that enough inputs are provided to continue production." This definition considers value and the links an organization has with suppliers, clients, and funders. Ellsworth (1998) combines this definition with the inter-generational notion that Scrageldin advocates, and puts the emphasis on action, thus defining sustainability for organizations as:

"the creation of recognized value for stakeholders, so that they continue to provide financing sufficient to allow for inter-generational creation of that value, while at the same time husbanding the existing capital stock so as not to jeopardize its use by future generations".

Ellsworth, (1998) observes that to achieve sustainability an organization needs to build and cultivate four types of capital. The first is *tangible capital assets* such as financial endowments, buildings, libraries, trucks, computers etc. The second is the *intellectual (or human) capital* dedicated to creating the organization's products. Third is *social support capital*, which consists of both goodwill and the economic and political support that the organization has generated among its existing and potential constituents. It is reflected in widespread willingness to pay for the organization among ordinary citizens, elected officials, and potential donors. Lastly, is *organizational capital*, a term hereby used to

refer to the value to society of having an organization successfully and competitively occupy a product "niche".

Sustainability of capital assets refers to the on-going maintenance, reinvestment, and replacement of physical and financial assets so they are not "used up" either by use, abuse, or inflation and remain available for future generations. *Sustainability of human intellectual capital* means the organization tries to recruit the best possible staff and sustain them at competitive levels of productivity with on-going reinvestment in their skills and competence. *Sustainability of social support capital* refers to the efforts of the organization's management and staff to keep its stakeholders (such as clients, tax payers, donors, government) happy and supportive of the organization's work. *Sustainability of organizational capital* refers to the on-going measures taken to ensure that the organization is greater than the sum of its parts and competitively occupies its niche. Organizational capital is embodied in the organization's management, its uniquely adapted way of doing things. Since this kind of capital is not easily measurable, a proxy for its sustainability can be the quality and effectiveness of policies and procedures to improve internal management systems of the organization, particularly those that define and create the organization's products and niche, and that supply on-going knowledge about clients' wants and needs.

Njoya, (2004) notes that the concept of sustainability has financial, and institutional dimension, however sustainability is more than financial since the impact of the work has to be sustained in the long run. Banerjee (1999) says there are broad issues of resource

capability that are relevant to the organization as a whole and these are largely concerned with the overall balance of resources. Sustainability thus cuts across several aspects of an organization and essentially entails resource possession or control, utilization and configuration towards organizational goals. These resources include physical, financial, human, intellectual, marketing, research and development, information and manufacturing (Banerjee, 1999; Johnson & Scholes, 2002).

Human resources also contribute to sustainability. Competence of individual employees and their level of motivation particularly their ability to anticipate accurately enough the outcomes of strategies for which they have no relevant experience enhances strategic efficiency and thus their sustainability (Mintzberg; 1989, in Njoya, 2004). Another aspect that contributes to sustainability is organizational culture (Njoya 2004). Sustainability is complex due to the need to coordinate resources of different nature. An organization's resources, the way they are allocated as well as the organization's values, norms and ethics have an impact on sustainability.

2.3 Financial Sustainability

Banerjee (1990) observed that it's important for any organization to pursue strategies that it's capable of sustaining. Aosa (1992) puts it thus; strategy being implemented should be realistic given the resources available. Capacity for such sustainment is a measure of organizations strategic capability and the wherewithal for this is provided by the resources at the disposal of the organization (Banerjee, 1990; Johnson & Scholes, 2002) since its resources that are deployed into the activities of the organization to create

competences. Johnson & Scholes argued out that organizational resources include those owned by the organization and those that can be assessed to support its strategies. This is because some strategically important resources maybe outside an organization's ownership, such as its network of contacts or customers

Stoll (2003) in his study of information kiosks (or "telecenters") in the telecommunication sector which he refers to as Public Internet Access Points (PIAP's) says when one talks of PIAP's sustainability, financial sustainability comes to mind for two reasons, one is that this would secure their autonomy and another is that outside funding often dries up. He adds that sustainability can not be seen on the basis of financial sustainability alone, it has to also include social & cultural sustainability, political sustainability and technological sustainability. On the same field of information kiosks, Kusakabe (2003) observed the key factor in achieving financial and operational sustainability is to get the community involved, an involvement of the beneficiaries too rather than the contributors alone.

Paxton and Fruman (1999) in their study examining the extent to which savings-first and credit-first programs throughout Africa have been able to move toward sustainability while reaching clients traditionally excluded from formal finance observed that a program that reaches the very poor but relies solely on donor funds is wasteful in several ways. From the donor perspective it uses scarce resources inefficiently. From the institutional perspective, it creates an external dependence for the financial institution. From the clients' perspective, the perception of impermanence and the use of external

funds rather than internally generated funds create incentive for default. Jansen (1998) in his criteria for reviewing funding mechanisms lists sustainability as one of them and questions, can the funding mechanism be maintained over the long run? He says in times of financial pressure, the tendency may be to make up funding shortfalls by whatever means are at hand, however if research systems come to rely on unsustainable funding mechanisms, they are simply postponing a more drastic decline in funding not too far down the road.

Havers, (1996) in Johnson & Rogaly, (1997) came up with a sustainability index for microfinance institutions, a method of calculating financial sustainability by comparing their costs with income. This formula can be adapted for non-profit making organizations and is outlined below.

Sustainability Index – Percentage of total Costs Covered by Income

$$= \frac{\text{total income earned from credit programme during the period}}{\text{total credit programme costs during the period}} \times 100$$

In the context of microfinance institutions, income includes interest and fees on loans while programme costs include staff costs, office costs etc. Costs that are not directly incurred, like free office space or labour should also be included while for loan funds received from donors as a grant, the calculation should include an imputed cost for

this (the interest that would have to be paid if these funds were to be raised from another source). The purpose of including such a cost is to make clear the dependence of the scheme on donors or other sources of subsidized capital.

In a study of 11 large established microfinance institutions, three levels of financial sustainability were identified (Christen, Rhyne and Vogel (1994) in Johnson & Rogaly, 1997; Robinson, 2001). These include:

Level 1 *subsidy dependent*: the costs of organizations are funded through grants and subsidies from donors. Among this group the spread between the lending interest rates and the cost of funds is too low to cover operating costs. Over time many such programs exhaust their funds and end their operations, leaving their clients with expectations that can't be fulfilled.

Level 2 *operational efficiency*: the non financial costs of operations (salaries and other administrative costs) are covered out of programme revenues (interest on loans and fees). These programmes still depend on subsidies to varying degrees for the cost of loanable funds. Financial institutions that are subsidized by governments and donors are often prevented by government regulations from mobilizing voluntary savings from the public or have little incentives to do so because they receive continuous injections of low-cost funds.

Level 3 *fully self-sufficient or profitable*: the institution is generating positive (inflation adjusted) returns on assets. In this group, revenues cover both non-financial and financial costs calculated on commercial basis, such institutions are profitable without subsidy.

Johnson & Rogaly, (1997) questions the ability to achieve financial self sufficiency in the context of microfinance institutions, especially where there is low population density, or where physical constraints like poor infrastructure and communication, and social constraints like illiteracy and female seclusion, increase the cost of delivering services. Other than financial self-sustainability, aspects of organizational and management structure are also important in ensuring organizations provide services in the long term, the organizational form may be the most significant design element in relation to long-term sustainability. He further observe that, considerations of sustainability in both organizational and financial terms need to be made from the onset, but even when the program is already underway, prospects for financial and organizational sustainability should be addressed, and where its be done within the national regulatory framework, it may be necessary to undertake advocacy work to change existing government policies.

Akroyd *et al.*, (2004) in their analysis of alternative and innovative sustainability strategies in agricultural research financing observe that fiscal, efficiency, and equity implications are key factors in determining sustainability.

Fiscal impact: some measures to generate more substantial revenues or savings may simply prompt a corresponding reduction in government allocation and are unlikely to generate substantial resources especially if the full investment costs of any capital development are incorporated.

Efficiency impact: options to improve cost-effectiveness are designed to achieve a more efficient allocation of resources in terms of securing more research output for less cost. This implies a strategy that leads to efficiency gains in service delivery and the

investment of funds with higher social rates of returns. Efficiency is likely to be increased where user contributions are accompanied by a more direct say in how research budgets are allocated. Priority setting then needs to be done as participatory approaches are often the first to be cut in times of budget reductions and powerful interest groups can dominate participation.

Equity impact: equity here is concerned with poor, such that the private sector will not find it profitable to serve them if the public sector withdraws. A notable fact is that greater private financing of research has the potential to improve equity where previous public funding represented a poorly targeted subsidy of largely private goods, provided that public-sector savings are redirected toward maintaining services to the poor.

In relation to agricultural research organizations, there have been several studies undertaken with most concentrating on the financing pressures and little on the concept of sustainability with respect to agricultural research organizations. Sustainability being more than financial, most literature looking on agricultural research organizations thus falls short on the concept and looks only at one aspect.

Sustainability strategies in agricultural research financing includes concerns for the quantity or level of funding, timeliness or stability in funding, financial accountability and the use of funds for issues or activities that are a priority for stakeholders and customers of an institution (Hill, 1995 in ASARECA, 1997). He adds that developing and managing plans, mechanisms and sources for such strategies involves processes of coalition development, strategic planning and institution innovation.

On the face of it, sustainability is difficult to quantify, but sustainability suggests an organization's ability to perform, after the external support or technical assistance has been withdrawn (McGill, 1994) and especially for donor funded projects or institutions. Sustainability requires a long-term view of the institutional development process. In agricultural research, Byerlee & Alex. (1998) opines that longer term financial sustainability cannot be achieved unless domestic political support for financing an increasing share of the research budget from domestic sources is developed.

For the concept of sustainability to be meaningful, it must refer to renewing, restoring or maintaining something specific, it has a futuristic orientation. Sustainability means stability.

2.4 Agricultural Research Financing Practices

The financing of agricultural services, and especially of research and extension, attracts much attention in the development community. Agricultural research and extension in many countries is looked at together and carried out by similar organizations but in Kenya these two functions are carried out and financed differently. In many nations, public funding for agricultural research, extension and other services is getting scarcer than ever and governments as well as donors are engaging in new forms of funding. On the recipient side of the funding system, more and more advisors and their partner institutions are faced with the need to raise money independent of conventional budget allocations.

In funding, the first issue concerns public and private roles in development. Managing funding levels for public services is not just a question of tax income but of principle. Which services are to be regarded as public and deserve public funding and which do not? Governments need to review their portfolio of services and decide whether to discontinue funding in some cases or have recipients pay in others. Secondly, rational funding has to use the economic principle, i.e. make the best use of scarce resources. Efficient allocation and control of funds is an important concern in any funding arrangement.

Mirroring the change on the side of the funding sources, a third issue refers to the increasing pressure resting with service providers to seek new funding sources. This requires additional qualifications and a new way of looking at stakeholders, which should ensure an enhanced client and development orientation of service institutions. Reversing the direction of decision making or reversing the flow of funds is a fourth topic of great interest. In the interest of sustainable development, there is the need to get away from a situation in which the money, the plans for using it and the services themselves are all dominated by the supply side.

2.4.1 Economic Framework

Akroyd (2001) points out that there is growing interest in alternatives to the standard model of a publicly provided agricultural research and extension system. The search for alternative approaches to the funding and delivery of research and extension services is driven by three main factors: 1) reappraisal of the role of the state and an associated shift

towards economic efficiency and market-based solutions for resource allocation and service provision; 2) the financial crisis facing many developing countries in an era of on-going structural adjustment and fiscal restraint; and 3) the perceived failure of agricultural technology systems to generate and apply successful innovations that successfully deliver enhanced productivity and income growth for smallholder farmer

The first two bring to the forefront the role of state in financing agricultural research and the increasing difficulties in fulfilling this role. On this note Akroyd (2001) outlines the economic framework that drives the public and private sectors in financing of agricultural research. The question of who should finance the service relates to the public and private characteristics of the good or service, and the degree and nature of any externalities. While for private goods the provider can appropriate profits, public goods have two attributes that discourage private markets because benefits cannot be appropriated by the supplier. First, they are non-excludable - once produced, non-paying consumers cannot be excluded from using public goods thus it is impossible to prevent 'free-riding; secondly, they are non-subtractable (or non-rival) - the consumption of a public good by one individual does not diminish its supply to others. Externalities on the other hand exist when the production or consumption of a good or service has spill-over effects (positive or negative) on other individuals which are not fully reflected in the market price, so that the good may be either over- or under-provided by the market.

In the case of a purely private good with no externalities, service provision should be privately financed. In the case of a pure public good, for which it is not possible to

exclude non-paying consumers, financing should come from public funds. Many services, however, embody a combination of both public and private good characteristics. In these cases a mix of public and private funding may be appropriate (Akroyd, 2001).

The extent to which research may be considered a public good is largely dependent on the amenability of that knowledge, or the invention or the product in which it is embodied, to various exclusion mechanisms that overcome the free-rider problem and enable the appropriation of returns to research investments (Beynon 1995).

Basic and most strategic research is generally considered to be public goods, while applied and adaptive research possesses greater private characteristics, depending on the type of research. For example, mechanical and chemical research is generally private, as patenting arrangements are comparatively straight forward. Biological technologies (the major focus of agricultural research in LDCs) are increasingly patentable, although the characteristics of self-pollinated seeds make patent enforcement impractical whereas hybrid seeds are naturally protected (Beynon 1995).

Akroyd (2001) observes at the very least, the allocation of public funds to research and extension needs to be carefully examined to ensure that the public sector is not unnecessarily funding activities that the private sector is able and willing to finance, thereby reducing the availability of public funds for genuine public good activities. The focus for state financing of research should be upon non-tradable staple foods produced by smallholders and consumed by the poor, and on research where a high proportion of

the benefits go to consumers, and on health, safety and environmental issues unlikely to interest the commercial sector.

Beynon (1995) observes that at a minimum, government need to take primary if not sole responsibility for financing basic and managerial research and for those aspects of biological, chemical and mechanical research where exclusion mechanisms do not exist. Secondly, the widespread weakness of the private sector and institutional framework means that the state also has an important role to play in creating an enabling environment and alleviating some of the constraints that tend to inhibit private sector research.

2.4.2 Alternative Financing Approaches

Diverse directions have been taken and multiple means of payment (public and private) have emerged as governments have opted for alternative financial arrangements to pay for and deliver public sector agricultural research. The various methods either seeks to reduce the scope of state financing in areas where the private sector maybe willing to participate or to improve cost effectiveness (Akroyd 2001).

One of the financing approaches is the complete withdrawal of the state (or privatization) from the provision of research which represents the most dramatic way in which public money can be saved and redirected to activities with greater public good content. In this situation services become demand driven and market oriented, there may be benefits from improved efficiency and cost-effectiveness in resource use. Importantly for government,

state withdrawal/privatization reduces the burden placed upon public finances. (Akroyd, 2001)

The principal disadvantage of state withdrawal from research provision is that the market is unlikely to provide services to poor farmers or those in remote areas or in countries with a large base of small scale-scale subsistence farmers. The market also fails to provide research and extension services directed towards environmental or social objectives. Experience suggests a gradual shift through cost recovery towards full private provision, with government providing the necessary enabling environment to stimulate private sector entry (Akroyd, 2001).

The second approach is cost recovery which encourages to cover, in part if not in full, the cost of research through levies or user charges. These cost recovery mechanisms are often introduced as a first step towards the full privatisation of services. The principal advantages of cost recovery are that it ensures greater client-orientation, improves accountability and efficiency, and reduces the financial burden upon government, thereby making services more sustainable.

Akroyd, (2001) observes that there are however, a number of problems, particularly for small-scale subsistence producers: 1) cost recovery is dependent upon farmer participation. This depends upon the ability and willingness of farmers to pay, which in turn depends upon the characteristics of the service (private/public good); 2) the efficiency benefits of cost recovery are unlikely to be realized unless they are accompanied

by increased competition between service providers; 3) it may be difficult to identify the appropriate level at which charges are to be made (the first step is to assess the current costs of service provision); 4) there are costs associated in collecting the revenues.

The imposition of compulsory levies to finance research is widespread, although largely confined to export commodities that are processed or channeled through a limited number of outlets; the scope for levy funding of basic staple food crops is more limited and where such funding has been successfully applied it has been largely dependent on a statutory (and easily enforceable) single channel marketing system. But these single channel systems are increasingly being dismantled thereby limiting the scope for imposing levies (Akroyd, 2001).

User charges and royalties represent a direct application of the principle that beneficiaries should pay for services received, and have been introduced to finance services where beneficiaries are clearly identifiable and the service has private good characteristics. While user charges are initially unpopular with farmers, this may be overcome following evidence of improved relevance and quality of services (Akroyd, 2001).

Consolidated Funding Mechanisms (CFMs) is the third approach and refers to the establishment of a single financing mechanism to co-ordinate different funding sources and instruments in support of an agreed national research plan. In this way, duplication of research effort between public and private sectors, and between donors, can be minimized (Akroyd, 2001; Weijenberg, 1995). While progress towards the development of CFMs has been limited, a number of countries have established *Agricultural Research*

Funds (ARF), including Kenya under KARI which may be regarded as simple prototypes.

ARI's typically utilize research capacity outside of government and promote greater user-orientation of research. Research grants are awarded on a competitive basis for research proposals that address priority issues determined by an advisory body (Akroyd, 2001; Heinze, 2001). Competition is meant to improve quality and efficiency and create a market for research and technology development services (Heinze, 2001).

Constraints of most consolidated funding mechanisms or Agricultural Research Funds especially on their financing aspect include; the high cost of administering such funds, maintaining the overhead costs to a reasonable level and establishing a cost-effective monitoring and evaluation system (Akroyd, 2001; Collion, 2001); institutional and financial sustainability. once the funds are spent the funds mechanisms are usually dissolved (Heinze, 2001; Collion, 2001). Another challenge is that such mechanism can result in a fragmented, piecemeal approach to research and extension because of the funding of demand-driven dispersed projects (Collion, 2001).

KARI established an Agricultural Research Fund (it's a discrete entity within KARI) in 1990 with the help of grants from USAID, The World Bank, Kenya Seed Company, Agricultural Research Foundation and government funds to cover operational costs (MTIF, 2003; Akroyd, 2004; Njagi et al. 2001).

Some of the above outlined constraints are evident in KARI's Agricultural Research Fund. Earmarking of funds for specific research areas by the different contributors is permitted which implies that far from being a consolidated funding mechanism the ARF remains highly "projectized" with donors stipulating how funds are to be used and determining overall research objectives. Moreover, given the high level of donor dependency the sustainability of the ARF is viewed with some skepticism by KARI management (Akroyd, 2004).

Notwithstanding these constraints this ARF is poised to continue as a discrete entity within KARI with future funding planned to come from an Agricultural Research Trust Fund to be set up under their 2000-2010 Strategic Plan (MTP 2002)

Instability of funding is a particularly serious problem for agricultural research, where cutbacks midway through a programme can waste many years of work. Endowments, the fifth approach to funding offers an effective tool that donors, national governments and other multilateral institutions (such as the World Bank) use to establish a sustainable financing initiative for the core and programme budget. They have the advantage of being able to isolate institutions from the inconsistency of government and donor funding levels and facilitate the achievement of institutional maturity (ASARECA, 1997).

An endowment is a difficult mechanism to create. It requires a substantial financial commitment from the sources that will provide the funds needed to capitalize the endowment (ASARECA, 1997; Akroyd, 2001), and at the same time reduces the amount of control those providers have on how those funds are going to be generated and spent. (i.e.

it makes the beneficiary more independent of the sources of funding once its established (ASARECA, 1997).

Research expenses are paid with the net returns (after the deduction of inflation and fund management costs). Endowments are frequently linked with grant making foundations under autonomous management, which may further contribute to transparent and participatory models of resource allocation. Endowments are also seen as a means of developing institutional capacity and independence from traditional donor sources.

ASARECA (1997) thinks that few African countries have the capacity and management skills to either financial or programme to take on an endowment. However, a substantial initial grant, coupled with an on-going fund-raising programme, is necessary to yield an income sufficient to finance a meaningful programme of research and other activities. Generally, the endowment's value should be 20 times annual research costs (Akroyd, 2001).

The capital for the endowment can be mobilized through a variety of means and the national government as well as donors can play a critical role. This could be through (ASARECA, 1997): 1) A direct grant to the endowment fund, or 2) Providing (donors) a long term interest free loan (say of 20 years) which can then be used to capitalize the endowment fund, or 3) Donors who are owed money by the and who are ready to write off a percentage of such debts, to do so by requiring the indebted country, as a condition to writing off the debt, to contribute a percentage or the whole of it to the endowment

capital, or 4) Commodity counterpart funds could also be used since most countries in the region have now liberalized their foreign currency transactions.

Contracting out is another approach to financing whereby there is competitive tendering of publicly funded research contracts. This approach has the potential to make service delivery more efficient. Conditions under which contracting out of services is most likely to succeed include: a well developed private sector familiar with competing for contracts; strong political leadership; a task that can be clearly and simply defined; an established 'contract culture' within government; capacity to monitor, measure and evaluate performance. However, only few of these conditions hold in developing countries (Akroyd, 2001).

Sometimes through Agricultural Research Funds (ARF's) contracts are given on competitive basis to individual scientists (or teams) in all institutions that constitute the national research system. This contract research is used as a means to improve accountability for results, to enhance collaboration among institutions and to create a degree of competition among scientists and institutions alike. Wherever introduced, contract research has markedly improved the formulation of research proposals in terms of their quality and relevance. They have had one overriding advantage, once a contract has been given; its funding is assured till completion (Weijenberg, 1995)

On the other hand the sixth approach, internal restructuring, may bring substantial savings and efficiencies through internal reforms that address issues such as staff composition and

Incentives, procurement procedures, and techniques of financial control. Processes of rationalization and downsizing invariably involve the shedding of staff in addition to the streamlining of services (Akroyd, 2001).

Final approach is the matching of grants scheme whereby contribution is tied to the level of funding obtained by the research institute from other sources. There is often a ceiling on the contribution to avoid overburdening the sponsor of the matching grant (Janssen, 1998).

The World Bank has instituted such a mechanism for its contributions to the CGIAR. It will make 12 percent available on top of the funding obtained by the international centers from other sources. As a way to shift the funding of certain types of research from the public to the private sector, matching grants are very useful. They are provided on the understanding that the benefits of research will accrue mainly to the producers who provide the counterpart funds. Such schemes provide a high premium to farmers for organizing themselves, and they may thus play a role in public policies aimed at strengthening the institutional backbone of the agricultural sector (Janssen, 1998).

Matching grants are an excellent way for the treasury to begin opening up additional funding sources. By adjusting its share, the treasury can influence the behavior of potential outside contributors but generally the government loses some control over the spending of research resources, since allocation is determined by the availability of other sources. From a national perspective, the accountability of a matching grant scheme may

thus be questioned. The key to ensuring accountability is to identify those agricultural sub-sectors in which such a funding approach might work well. Normally these will be ones with well-organized producers to whom research will provide direct benefits. Thus, research on subsistence food production and on natural resource management cannot be financed successfully by matching grants (Janssen, 1998).

In conclusion (Waithaka et al, 2001) observes that state withdrawal from direct control of research works best when there is already an active private sector and the macroeconomics and sectoral policy are conducive to further private investment in service provision. Levy financing is most appropriate when the marketing structure is sufficiently concentrated to permit ready collection, while other commercialization, cost recovery and revenue-generation measures work best where adequate financial management exists and collection costs are low. Many such measures will have a positive equity effect, but distributional concerns will be best protected when there is a political commitment to maintaining services to the poor.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Population and Sample

This was a case study of KARI. The uncertainties associated with the financing of its work that affects the institutes long term planning and research activities could best be studied using the case study method to give an in-depth account of the problem and facilitate an in-depth study of the organization (Mugenda & Mugenda, 1999). The respondents were the top management and key senior people who have been with the organization since its inception. Thus their contribution was guided from a broad reservoir of experience and knowledge.

3.2 Data Collection

The study utilized both primary and secondary data. Primary data was collected using in depth interviews guided by interview guide.. The researcher scheduled one on one interviews with top management and key persons from both the Research & Technology and Finance & Administration Sections and took detailed notes during the interviews. Secondary data was collected from the various publications and documents to validate and add on the primary data and to help with the analysis. This included the various documents relating to the overall strategy and related publications and strategy papers dealing with the individual strategic objectives.

3.3 Data Analysis

The data collected was qualitative in nature and all the detailed notes made during the interviews were analyzed using content analysis. The data was analyzed through the key themes of organizational and financial sustainability strategies and the challenges encountered in implementing these strategies. Organizational sustainability strategies were further broken down to capture strategies on capital assets, human resources and stakeholder relationship. This entailed looking at the manifest as well as latent content and the symbolic meaning of responses. The researcher used frequencies in the data and the percentages or proportions of particular occurrence to total occurrences, to interpret data and illuminate what was being investigated as per the objectives.

Koigi (2002), Njau (2000), Kandic (2001), Kirui (2001) successfully used content analysis in past studies.

CHAPTER 4: FINDINGS AND DISCUSSION

4.1 Introduction

4.1.1 The Profile of Kenya Agricultural Research Institute

KARI is the main player in the national agricultural research system – the network of institutions, public or private, working on agricultural research and committed to a national research agenda. It was established in 1979 via an Act of Parliament and is a government institution, wholly owned by the government but semi-autonomous in its operations.

Kenya's economy is driven by the agricultural sector as over the last four decades, economic growth has followed the same trend as agricultural growth. The sector contributes 26 per cent of the Gross Domestic Product and a further 27 per cent through its links with the manufacturing and other sub sectors. It also accounts for 60 per cent of the export earnings while 80 per cent of the rural folk derive their livelihood from agriculture. Agriculture has acquired this magnitude largely due to the intensive work done by KARI.

In its early years, KARI referred to the former East African community agricultural and veterinary research programmes and it is in 1989/90 that all crop and livestock related research were consolidated under a single KARI management. This is also the time a vision of Kenya's long term National Agricultural Research Programme (NARP) was developed and was to be implemented in five year phases financially supported jointly by the Government and development partners.

KARI is headed by a Director who is assisted by two Deputy Directors; Deputy Director Research and Technology and Deputy Director Finance and Administration. The former deals primarily with research, while the latter deals with the administration, personnel management, accounts, assets management, finance and all other no-research activities. Under the Deputy Director Research and Technology are Assistant Directors who head specific areas of interest/programmes that KARI research on while under the Deputy Director Finance and Administration is Assistant Director Human Resources and other functional heads in supplies, estate management, accounting, and administration. Overall direction of the institute is overseen by a Board of Management.

KARI's work is divided into several programmes with emphasis being on crop and animal research. It also has programmes focusing on soil and water management, range research, biotechnology, infrastructural development and socio economics. The results of its work which rarely catch the public eye have been impressive. Since 1985 it has released more than 135 crop varieties that contribute to higher yields by targeting specific production problems like disease and drought. For animal research, in recent years it has developed 15 livestock vaccines and diagnostic kits which have helped control major diseases like rinderpest, foot and mouth, east coast fever among others.

Its success has been possible because of the huge research infrastructure, the largest in Sub-Saharan Africa, built over the years. Its 23 main centres, scattered all over the country have been rebuilt or rehabilitated and re-equipped to create a conducive environment for scientists to work. The physical infrastructure aside, it has a remarkable human resource.

In 1989 it had a total staff complement of 6200 which has now been streamlined and the number of competent scientists expanded. staff numbers now stand at approximately 3700, of which 580 are scientists, an impressive accumulation of scientific knowledge unlikely to be found anywhere in Africa (KARI 2005).

The study focused on the sustainability of the organization and sought to determine whether KARI had an organizational and financial sustainability orientation as sustainability was viewed as encompassing the whole organization rather than one aspect. Challenges encountered in achieving these sustainability strategies were then sought, these were the problems, and constraints encountered in trying to achieve the first objectives.

The researcher sought to determine the strategic outlook of the organization as the basis of understanding the organization's efforts and strategies if any to achieve organizational and financial sustainability. Major themes focused in determining how the strategies were formulated and for organizational sustainability the themes included physical assets, human resources as assets and stakeholder relationships. In financial sustainability major themes was the roles of the governments as the 'owner' of KARI, development partners or donors as the other identified financiers, any other financing measures and the financial sustainability strategies being explored. All these were looked at in a long term context which sustainability is the ultimate goal.

4.1.2 The Respondents Profiles

The respondents in this case study are part of the top management of Kenya Agricultural Research Institute. They have been involved in looking at the problem of organization and financial sustainability considering the unique features of the organization as provider of a public good. Majority of the respondents have held management positions in the Institute for a long time having been with the Institute since its inception. Thus their contribution was guided from a broad reservoir of experience and knowledge.

4.2 Organizational and Financial Sustainability Strategies.

4.2.1 Strategic outlook

Strategy being the long term direction of an organization and sustainability also having a futuristic orientation, the researcher sought to ascertain whether the Institute had such strategies. The focus here was to determine the overall situation and general direction of the Institute. Presence of strategies and their formulation was determined through the interviews and this was further collaborated with existing and past strategic plans and documents detailing the strategic outlook of the institute.

The researcher observed that there was a clear strategic outlook in the institute that guided and was the basis of all its activities. There was a strategic plan in place which had been formulated consultatively with the input of various stakeholders, both internal and external and included researchers, farmers, several non governmental organization, donors, other related ministries, centre, assistant and deputy directors among others. The whole process was guided by a consultant on strategic management and took cognizance

of the government's policy direction on agriculture. Priority setting was an integral aspect guiding the research agenda setting which was done consultatively and linked with the strategic plan.

A preview of KARI's *Vision, Mission and Strategic goals* is shown below as outlined in their Strategic Plan 2005-2015.

Vision, Mission and Strategic Goals

Vision

KARI envisions a vibrant commercially oriented agricultural sector, propelled by innovative technologies, knowledge and approaches that respond to demands and opportunities.

Mission

To contribute, together with its partners, agricultural innovations and knowledge towards improved livelihoods and commercialization of agriculture through increasing productivity and fostering value-chains while conserving the environment

Strategic Goals

Five strategic goals have been identified. These goals express a stronger organizational commitment to impact as the strategic orientation and positioning of KARI and embrace its response to the demands and emerging opportunities. These goals are:

- Integrated crop value chains fostering commercialization of agricultural enterprises.
- Integrated livestock value chains fostering commercialization of agricultural enterprises.
- Sustainable and integrated management of natural resources for agricultural production.

- Institutional arrangements for enhancing concerted action for development and uptake of technologies and innovations.
- Capacity and competence building for integrated agricultural research and development.

Source: KARI, 2005

A strategic outlook in the institute could be traced to the time when KARI was set up. When Kenya's vision of National Agricultural Research Programme (NARP) was drawn up by the government with the help of development partners, it marked the *defacto* beginning of KARI (KARI, 2002). NARP was envisaged to be a long term programme (15-20 years) in phases of five years and in its second phase of implementation (NARP II) a process of corporate planning was initiated. This became the first attempt at strategic planning and it was not until 2000 that KARI published the first comprehensive strategic plan, Strategic Plan 2000-2010. This has now been reviewed and presently the institute is implementing the Strategic Plan 2005-2015 (KARI 2005).

Since its inception there have been concerted efforts to ensure the activities of the institute were based on predetermined plans that were consultatively and thoroughly formulated as evidenced by NARP I & II plans and the two strategic plans.

4.2.2 Capital Assets

In looking at organizational sustainability strategies, capital assets were one of the major aspects and here the researcher was interested in strategies relating to capital asset like

buildings, land, facilities and equipments. Focus was on physical assets adequacy and on-going maintenance, reinvestment and replacement efforts so that they are enough for the staff to utilize in their work, are not used up either by use or misuse and remain available for use in future.

The researcher observed that KARI had adequate capital assets but noted this was on a general outlook. Assets available were utilized to conduct all the relevant activities and no distinct shortage could be found of a particular asset. The institute owns a fairly large number of different assets including land and buildings, laboratories, offices, staff quarters, green houses, animal houses, workshops etc (KARI, 2002). Though land was enough even for future use it was noted that for some centres it would not be enough to carry out future anticipated growth especially for centres requiring multiplication of basic and pre-basic seeds like maize and potatoes that required large tracts of land for this purpose. Buildings were adequate and for those centres requiring new ones plans were at an advanced stage to have them built, and repair of existing ones was being decentralized with the centres now being required to maintain them.

To achieve future availability and ensure proper use of its capital assets, researcher established that land repossession and title acquisition measures were being implemented such that while in 2000 out of the 77 parcels of land KARI owned, it only had title deeds for only three but by 2005 it was having 26 title deeds. Decentralization in asset maintenance policy was in place to ensure proper asset maintenance in this regard the

institute had set up a section in all centres (Estate Management) to deal with all maintenance of assets in each centre.

Kenya Agricultural Productivity Programme (KAPP), a long term agricultural research and technology dissemination programme that was being implemented had a component that was to build new office blocks/buildings in centres that have old ones. Findings indicated that since it was difficult to optimally equip all laboratories countrywide, all laboratories had been equipped with basic equipments while a few in strategic regional locations had been upgraded and were to act as "*Centres of Excellence*". Strategies to achieve ISO Certification for these *Centres of Excellence* were being implemented while commercialization is expected to efficiently utilize existing excess capacity. To keep up with advances in research technology, a Bio-safety Level II laboratory had been constructed to conduct biotechnology research in genetically modified maize.

The responses thus indicate that the institute though not having state of the art buildings and facilities, it had instituted strategic plans to utilize whatever facilities that it had in line with research priorities and resource limitations, and at the same time instituted an asset maintenance policy and was adapting and utilizing modern research techniques thus keeping pace with research trends.

4.2.3 Human Resources

Human assets are the next major aspect of organizational sustainability that the researcher delved into. Human assets are the core of any organization as they create an organizations

product. Sustainability of human intellectual capital requires an organization to recruit the best and maintain them at competitive levels of productivity. The researcher was interested in their adequacy levels in optimal quantity, staff turnover and skills mix, and the sustainability strategies to ensure their future availability in the required mix and quantity. The researcher sought respondents understanding of the human assets aspect and at the same time looked at the KARI's efforts as an institution whereby the institutes policies and strategies were analyzed at different points in time, and the efforts being done to achieve sustainable human resources.

The researcher discovered that the institute had adequate human resources. Respondents concurred that as an organization, KARI had the highest concentration of highly trained people. It was noted that though the human resource was the core of the institute's success and had been continuously improved in terms of quality and quantity, its future looked uncertain as there seemed to be no provision to cater for natural attrition, aging of staff especially since there was no new recruitments geared to replace the aging staff when they retire and some relevant skill were not enough. Excess support staff that distorted the accepted ratio of scientists vs. support staff was noted while modern research fields like biotechnology required more scientists. Respondents were aware of the Human Resource Strategy that had recently been formulated and was being implemented, this they noted was to take care of present and future human resource requirements to ensure KARI achieved its human resource strategic objectives.

Staff quantity and skills mix (staff complement)

Table 1: Summary of KARI staff complement by broad cadres, 1998, 2005 and 2008.

Broad Cadre	October 1998	February 2005	Optimal 2008	Balance(2008)
Scientist	453	575	627	52
Non-Scientist	4187	3148	2884	(264)
Total	4640	3511	3511	(212)
Scientist:non scientist ratio	1:9.2	1:5.5	1:4.6	

Source KARI IIR data

A look at Table 1 reveals shows that the total staff complement in October 1998 were 4640 and in February 2005 was 3511. The number of research scientist had increased from 453 in 1998 to 575 in 2005 while that of non-scientist staff had decreased from 4187 to 3148. Similarly the ratio of scientist to non-scientists has decreased from 1:9.2 in 1998 to 1:5.5. In 1989 KARI had a staff complement of 6200 and was proposed in NARP I to be increased to 8600 by the year 2000 but this target was shelved (KARI, 1998).

In 1998 it was observed that they had an excess complement of staff especially in the lower cadre and there was need to lower the ratio of support staff to scientist from the then 1:9.2 to an internationally recommended ratio of 1:5 (KARI, 2006). Through a staff rationalization program incorporating natural attrition, redeployment, to the ministries and retrenchment the institute has managed to lower this ratio the then 1:9.2 in 1998 to

1:5.5 in 2005 (KARI, 1998; 2005). After analyzing and rationalizing the staff requirements for each centre and programme the institute determined that the scientists to non-scientists ratio should remain at 1:5 and that the total staff establishment should remain at about 3500. An optimal number of scientists was set at 627 and 2884 for non-scientists, giving a total of 3511 and a ratio of 1:4.6 (KARI, 2005).

Table 1 further reveals the deficits and excesses in achieving optimality in the different cadres. The table shows that the institute will require an extra 52 scientists and should do away with a further 264 in different cadres after considering the requirements in terms of quality of skills and quantity required to run the programmes effectively. To achieve these projections, the institute saw no need of retrenchment as natural attrition could stabilize this but retraining of excess staff to be deployed in to areas where there were deficits and hire only in areas where there were no trainable staff to fill the vacancies (KARI, 2005)

The researcher observed that the institute was on its path towards achieving strategic goals regarding human resources quantities and skills mix as set in previous master plans and strategic plans. The various measures put in place showed impressive results as the institute was moving towards achieving the 2008 staff complement targets.

Staff Losses/Turnover

Staff losses/turnover indicates an underlying cause when high and has implications that can affect the operations of an institution especially one where the human resources are the major asset. Losing an institutions best staff sets back years of training and

experience and replacement of the same to the previous level is a daunting task. KARI is an institution whose productivity is driven by the training and experience of its human resources and having a high concentration of highly trained staff is vulnerable to loss of staff. The researcher sought to determine how intense is the staff turnover and how the institute was dealing with it.

Table 2: Loss of KARI Scientists during 1998-2003

Cause of loss	Scientist Category			
	Bsc	Mac	PhD	Total
Leave of absence	28	9	15	52
Retired	27	0	4	31
Secondment	7	2	2	11
Dismissed	9	3	1	13
Resigned	11	0	2	13
Transferred	0	2	2	4
Deceased	22	0	1	23
Total	104	16	27	147

Source: KARI HR data

Staff loss at KARI is due to retirement, leave of absence, secondment, transfer, resignation, dismissal and death and in six years from 1998-2003; it had lost 147 scientists to the above reasons as shown in Table 2. Retirement, leave of absence and deaths were the main causes of staff loss with the institute losing on average 25 scientists

annually or 5 per cent of this cadre while leave of absence accounts for 35 per cent of all scientists lost which was by far the largest single reason for staff loss. Leave of absence for the institute contributes largely to its staff loss and has to be controlled to reasonable level so that both the institute and the scientists benefits from its advantages. Retirement which was the next highest contributor to staff loss as indicated in table 2 is further analyzed in table 3 below

Table 3: Age Profile of scientists and senior managers as at January 2005

Qualification	Age Bracket				Total
	20-34	35-45	46-55	56-65	
Bsc	50	47	31	2	130
Msc	44	128	144	10	326
PhD	3	33	75	8	119
Total	97	208	250	20	575

Source. KARI HR data

Table 3 above outlines the age profile of scientists and senior managers and it shows that most of the scientists and senior staff are in the age bracket of 35-45 and 46-55 . 36 per cent and 43 per cent respectively with the majority of PhD holder lying in the 35-45 and 43-55 age brackets. Retirement which was the next highest contributor to staff loss was addressed by the extension of retirement age from 55 years to 65 years and towards utilizing this ten year advantage human resource planning was to manage the succession in the institute.

The human resource aspect of the institute showed an asset remarkably handled over time and constantly evaluated to achieve set strategic goals that were in line with the institute's core business of research. A policy decision was needed on the issue of leave of absence to limit it to an appropriate proportion. Various strategies were being implemented to achieve sustainable human resources. Redeployment of excess staff was being done and was to be combined with training of the redeployed staff on essential skills in the areas of redeployment. Future recruitment was to be limited to Masters level and outstanding first degree holders who could be moulded into KARI's specific requirements of scientists to efficiently utilize the low and mid-level cadre staff, multiskilling was to be explored as a way of motivation and job enrichment.

For motivation it was observed that a lot needed to be done as the institute's pay and motivation structure was similar to the civil servants one that had numerous complains over time and greatly affected the motivation and performance of KARI's staff. In this regard immediate, mid-term and long term strategies were being formulated and fine tuned. Taking into account cost considerations, the immediate actions included review and rationalization of the revised salary structure, the schemes, terms and conditions of service and preparation of disciplinary procedures. The medium term actions are to include review of allowances and benefits, while long term actions included preparation of broad banded salary structure and development of motivation strategies. These strategies were being developed having in mind the various motivational theories so as to take care of the intrinsic and extrinsic factors affecting motivation.

4.2.4 Stakeholder Relationship

For publicly supported organizations stakeholders are the people with a direct interest in the organizations' existence either in paying for the organization by contribution or by purchasing or using its products. Each type of stakeholder has different interests in the existence of an organization and each ones willingness to partake in the organizations' activities differs. For an organization to keep its stakeholders happy and supportive is no easy task and it is an inescapable task as it has to work with and in conjunction with stakeholders. The researcher sought to determine who the institute's stakeholders were and how it related with, worked with and nurtured its relationship with stakeholders and in this regard got valuable insights from the respondents and various institutional documents.

The nature of KARI's work requires interacting with a variety of stakeholders. These were identified as farmers, universities, Non Governments Organizations (NGO's); Community Based Organizations (CBO's), Ministries of Agriculture, Livestock, Cooperative Development, Water & Natural Resources, Planning and Finance; international research organizations like ICIPe, ILRI, ICRAF etc; donors among others.

Relationship with stakeholders was deemed to be good although instances where the relationship was not cordial were revealed, like some farmers who thought KARI was not producing technologies that could help them or various ministry officials who felt KARI was favored in allocation of resources by the government or the stringent donor conditions.

The present strategic plan of 2005-2015 had a strategic objective that expressly outlined the need and ways of nurturing partnerships and relationships with stakeholders. It defines the expected outputs, the strategies to achieve them and expected challenges. It was acknowledged that KARI does nurture its relationship with its stakeholders an aspect that is ongoing and geared to be used in future. Various ways of collaboration, discussions and forums are utilized. Memorandums of Understandings (MOU's) are used to detail relationships with institutional stakeholders like universities and international research organizations, and are formulated any time there is a recognized need to work together. Interaction with farmers is through farmer field schools, days and shows; these are the forums where they are taught the various technologies produced by KARI. Research priority settings at each centre was set by the Centre Research Advisory Committees (CRAC'S), these communities include researchers, farmers and other stakeholders. Donors on the other hand got various reports both financial and technical on what they fund and in conjunction with KARI, a consultant usually an international one conducted External Programme Reviews (EPR's) for donor funded projects. The researcher noted that no researcher could conduct research without collaboration with other researchers within KARI and collaboration with researchers from other organization both within Kenya and outsider was highly encouraged.

4.2.5 Government's Role

The of goal of sustainability is to make an organization more competitive and better nested among local and regional organizations, more accountable to its stakeholders, more credible with donors and most important successful in delivering valued products and more effective, efficient and productive in its core business. When the government

set up KARI it had a vision and purpose for its existence and in essence took the primary if not the sole responsibility of supporting and financing its work. The researcher here sought to determine the government's role in financing research and in this regard delved deep while interviewing the respondents as well as analyzing various institutional documents.

Table 4: KARI Expenditure, Funding as % of Expenditure

Period	Funding as % of Expenditure		
	GoK	Donors	Internal Revenue
1988/89	37	61	2
1989/90	29	69	2
1990/91	29	69	2
1991/92	31	68	1
1992/93	29	68	3
1993/94	39	59	2
1994/95	44	55	1
1995/96	46	50	4
1996/97	47	45	8
1997/98	52	44	4
2001/02	55	39	6
2002/03	56	35	9
2003/04	53	40	7
2004/05	58	34	8
2005/06	56	39	5

Source KARI records

- a) 2005-06 financial year figures are estimates
- b) 1999/00 and 2000/01 figures not included
- c) GoK Government of Kenya

Table 4 above shows the proportion of funding for KARI's expenditure over the years since 1989 for different sources. In the initial years from 1989/90 to 1993/94 the donor's contribution was higher than the governments' and sometimes was twice its contribution. In the period 1994/95 to 1995/96 there was an almost equal contribution by the government and the donors and especially if one considered the internal revenues. Finally in the later years, from 1995/96 to 2004/05, the government's contribution has exceeded the donors. Similarly the portion of internal revenue has steadily been increasing from as low as 1 per cent in 1991/92 and 1994/95 to as high as 9 per cent in 2002/03.

NARP I & II research programmes were being implemented in these period and account for the high donor contribution to research as a lot of capital infrastructure development, purchase of equipment and capacity building was done in this period. Subsequent reduction in donor portion has been due to the institute and the government increase in their role and after the decision to reduce dependency on donor funding for research. Most of donor funding has been going to fund research while the government's contribution takes care of salaries, emoluments and maintenance. In the latter years, the government contribution has been high in part due to its increased role in funding research but also reflects the increased focus on spending more on the staff as the main drivers of research, this has increased the size of salaries and emoluments. The increase in the portion of internal revenue has been from the concerted efforts by the institute to increase the revenue generation capability as it pushes towards self financial sustainability in the long term. Table 4 shows that though it is assumed that donors overwhelmingly fund research, government's role has been steadily increasing over time.

The researcher observed that the government role was deemed dependable and sustainable observed as it had never failed in paying the salaries and emoluments and even had improved the same in recent years. In recent times the government had been playing a more active role in supporting agricultural research policy and financial wise. Sustainability was seen in that the government main source of funds was taxation, which was deemed available in future and to be extended to fund KARI's work.

But it was also noted that the government's role was on the other hand seen to be unstable, undependable and unsustainable when looked at the totality of its role and was seen as not fully fulfilled. The government needs were many and agricultural research was competing with a myriad of other important needs. Instability was seen in the reduction in budgeting allocations to KARI in previous years as whatever amounts KARI asked in their budgets was never fully provided. Respondents saw sustainability as being hinged on the government of the day and political will to support agricultural research which they felt changed with subsequent governments.

The researcher found that it was the role of the government to fund KARI's strategies/agricultural research although it was felt the role also extended to KARI itself. But the government had not adequately been playing this role. The government had not been fully financing KARI'S activities, making the institute seek alternative ways. This was variably explained as due to lack of enough resources for the government thus annual allocations varied and reduced as time went by. The government still played a major role

of paying salaries, emoluments and allowances and part of operating & infrastructure maintenance expenses. This contribution it was noted played an important role in KARI's negotiation for funds from other sources as it was recognized as its share of counterpart contribution in any financing proposal. The facilitation the government played in sourcing financing especially from donors was also considered a major contribution of the government. A notable observation was that the government by extension funded agricultural research almost fully as it repaid the loans advanced by the donors; thus had not failed in its obligation or mandate to fund KARI's work.

4.2.6 Donors Role

Donors have been cited as playing a major role in the activities of research organizations in many countries but had been their role was deemed as varied, driven by their interests and subject to their changing focus as per the international donors changing interest areas that sometimes not in line with countries priorities. The researcher sought to determine what role the donors had been playing, whether their role was deemed dependable, stable and sustainable and whether they dictated the research agenda. Part of the sustainability concept is the ability to be stable, focused and in control of what you aspire to achieve.

Table 4 above showed the proportion of funding for KARI's expenditure over the years. It showed that in the initial years from 1989/90 to 1993/94 the donor's contribution was higher than the governments' and even after the increased government's contribution; the share of the donors is still sizeable enough to affect and cripple activities if withdrawn.

The researcher observed that donors had played an important and immense role in financing KARI's strategies/agricultural research. Since the government never played its financing role fully, donors had helped fill in the void such that they were the main financiers of research while the government took care of emoluments and part of infrastructure maintenance. Donors also had built most of the buildings that KARI possessed, and it is through their support that KARI has managed to have its impeccable human capacity.

The question of whether or not the donors financing priorities are in line with KARI's strategies and priorities drew mixed responses. Some respondents felt they articulated and financed areas of the interest to them which were not KARI's priorities. Others observed that KARI had a variety of priority areas which matched the different interest areas of different donors thereby reducing the donor's ability to push to finance their interest areas. Others on the other hand pointed out that research priorities were set out beforehand in the overall national research plan and the donors then invited to fund areas which were of interest to them. Notable was the aspect that major funding was through the World Bank loans which were repayable, and were directed to KARI's priority areas.

The question of whether the donors' role was dependable stable and sustainable also drew mixed responses. Some respondents were undecided whether donors were dependable, stable and sustainable while there were those said that as long as there was a signed agreement, within a contract period and as long as KARI fulfilled the agreed requirements, the donors were dependable but they were categorical that donors were

unsustainable. The researcher found that notwithstanding table 3 indication of the donors support over the years it was largely felt that donors role was undependable, unstable and unsustainable as they could quit any time, their conditions were many, stringent and varied with individual donors, they changed their attitude with time, their interests were inconsistent with KARI's and donor support depended on political situations, prevailing in the country, if good KARI benefited, if poor it was abandoned with projects midway through implementation.

But there were those respondents who felt on one hand donors role was dependable and stable so far as they had helped KARI a lot, even when their relation with the government were frosty they had continued funding KARI. But on the other hand they observed that political environment played a significant role in donor support, overtime donors support to agricultural research has been reducing. Respondents emphasized that KARI should strive to take care of its future independently and not stake it on other institutions.

4.2.7 Other Financing Measures

The researcher sought to determine what other ways KARI financed its strategies and found that the bulk of KARI's strategies were financed by the government and donors, but also small or miscellaneous donors and internal revenue sources played a smaller role.

4.2.8 Financial Sustainability Strategies

On the question of the strategies KARI has instituted to ensure financial sustainability and whether they were bearing any fruits it emerged that this was an issue that was critically being looked at. Internal revenue generation had been identified as a major area that could be improved on and generate a big proportion of the financial resources. This entailed commercialization of various activities and capacities, excess resources and un-optimally utilized resources like laboratory facilities, human resources and land. Consultancy and patents & royalties were also identified as areas that could improve financial resources generation coupled with sale of seeds, and seedlings and technology generated.

In this regard KARI had set up several measures to exploit these revenue potential. They have set up a section or department called Agricultural Research Investment Services (ARIS) to lead the efforts of commercialization and other related activities that would improve internal revenue generation. KARI has also initiated measures to enforce Intellectual Property Rights through their legal department although it hand faced difficulties regarding the Act of Parliament dealing with intellectual properties which had yet to be cleared in relation to technologies and knowledge generated through agricultural research. To sort out this technicality KARI was lobbying parliament to pass the relevant legislation.

Another measure that was revealed was the setting up of an endowment fund which was to be capitalized through individual and corporate contributions and through debt relief.

This had been worked on and presently a cabinet paper had been prepared and was awaiting cabinet discussion and approval before it could be set up. All these efforts were at their infancy stages and their success could not conclusively be determined. The researcher noted there was great potential in internal revenue generation spearheaded by ARIS so far all was going well but it would take years before ARIS revenue generation activities could be depended significantly to support agricultural research. For the endowment fund, few of the respondents were aware of the efforts to set it up and its capability was yet to be seen.

4.3 Challenges Implementing These Sustainability Strategies

The researcher sought to determine the challenges KARI was experiencing in implementing both the organization and financial sustainability strategies and how it was tackling these challenges. The long term nature of the sustainability is at risk of losing focus, drive and direction unless the problems encountered are solved. The insightful responses from the interviews conducted were combined and are presented below in the major themes of capital assets, human resources, stakeholder relations and financial strategies.

4.3.1 Capital Assets

The researcher observed that even though KARI had on average adequate capital resources, their maintenance was a major problem. This was because financial allocation from the government to take care of infrastructure maintenance was not enough. Inadequate financial resources was also affecting KARI efforts to equip their laboratories

to desired level for all centres and more important to achieve ISO Certification in selected "Centres of Excellence". Land grabbing had also been a major problem in the recent past but had ceased.

To deal with these problems KARI has instituted legal measures through its legal department to get title of all its land and recovery measures for grabbed land & staff houses were currently being implemented. To maintain their facilities KARI was presently implementing a policy requiring centres to maintain their facilities rather than waiting for the head office (decentralization of maintenance). On the same level, KARI was exempted by the government from remitting its internally generated revenue to treasury (Ministry of Finance), Centres were allowed to retain and use 70% of internally generated revenue while the head office took 30%.

4.3.2 Human Resources

A major problem facing KARI was the *Terms & Conditions of Service*. The salaries were not competitive enough for the highly trained staff and this was a major cause of staff leaving and moving to better paying institutions like universities and international research organizations. This is a major loss to the institute as it spends substantial resources training its staff both locally and abroad who later leave. Other problems include staff motivation, excesses in some cadres and shortages in others although the shortage was not an alarming one.

KARI also faces the problem of replacement of its retiring staff. With the current freeze on hiring policy by the government KARI faces the risk of staff previously hired in lot retiring at the same time.

Various measures were being put in place to address these problems. The Scheme, Terms and Conditions of Services were being reviewed to make them more competitive and enhance staff motivation. This has been greatly enhanced by the recent salary increments and allowance policy introduced by the government. The *Human Resources Strategy 2005-2009* currently being implemented was taking care of staff excesses and skills gaps through rationalization and redeployment (KARI, 2005). Its implementation was taking care of skills gap through hiring and training, with hiring being done on areas with knowledge gaps while training was a major component of capacity building in the overall national research programme being implemented called Kenya Agricultural Productivity Programme (KAPP). To ensure the institute does not in the near future face staff shortage through retiring, the government raised the retirement age of KARI's scientists from 55 years to 65 years, this was also meant to curb their movement to universities where the retirement age is similar.

4.3.3 Stakeholders

Problems related to stakeholders' relationships were not considered major by the respondents; mention was given to specific stakeholder relations. A problem with donors was in constraints in resource flows (financial resources) which at times were delayed or was not smooth enough thereby affecting ongoing research. Donors have a myriad of

conditions to meet and conforming to these conditions that differ with different donors was an issue. Some respondents were wary of donors' ulterior motives. Change of government and ministries affected ongoing relationships, while misconception and envy by farmers and other ministries was putting KARI on a collision course with partners who could work better with if understanding of each other's goals was mutual.

It was observed that the best way to deal with stakeholder problems was through consultations and discussion which KARI adequately does. Memorandums of Understanding (MOU's) were cited as helping define mutually agreed benefits, outputs and methods of interactions with other institutions. Scientists/researchers and management publicized KARI in the many fora they interact with stakeholders in an effort to make them understand KARI's work. On the other hand farmers were at times required to cost share in some services provided by the institute. A major pilot programme named ATIRI looked at ways of improving and increasing stakeholder participation especially farmers in KARI's work and it is on the recommendations and success aspects of these programme that the present national research strategy being implemented (KAPP) was modeled on.

4.3.4 Financial Strategy

It was noted that financing agricultural research required sizeable amounts of money, which were also needed to maintain facilities and staff at levels that could produce technology and knowledge to meet priority problems. Financial resources availability was a major problem. KARI's mandate was not to generate money and as it was

instituting strategies to achieve financial sustainability it has to ensure that it does not deviate from providing the public good it was established for. It was observed that KARI did not have the business expertise required to achieve its financial sustainability as research-scientists were not skilled and experienced in money making and business management techniques.

Challenges included getting the initial capital required to set in motion the various strategies put in place especially the activities of ARIS in spearheading commercialization; consultancy though having a high potential of improving revenue generation was not being optimally exploited; at the centre level the facilities expected to implement the commercialization strategy were not oriented to commercialization and a lot was needed to be done to bring them to that level. Other challenges included the slow pace the endowment fund was taking to be operational, this required the approval of the government before the next major step of capitalizing was done and on the other hand Intellectual Property Rights enforcement was dependent on parliament's approval, a process that was taking time.

KARI's response to these problems was varied, and in this regard it was getting a lot of support from the government. The government was supporting more and more agricultural research through increased budgetary support and was also sorting out the intellectual property enforcement issue. ARIS on the other hand was also training researchers at the centre level to improve their capacity while the issue of business management expertise was being handled by the human resource training and

development department. Lobbying the government and other major stakeholders like donors was an aspect that was continuously being done to ensure their continued support to the financial sustainability strategies being implemented.

CHAPTER 5: SUMMARY CONCLUSION & RECOMMENDATIONS

5.1 Summary

5.1.1 Organizational and Financial Strategies

The findings of the study indicate that KARI had put strategies in place to achieve organizational and financial sustainability. To ensure future availability and use of its capital assets, land repossession and acquisition of title measures were being implemented while decentralization in asset maintenance policy was in place to ensure proper maintenance of capital assets. Kenya Agricultural Productivity Programme (KAPP), a 15-20year agricultural research and technology dissemination programme being implemented now has a component that is to ensure building of new office blocks/buildings in centres that have old buildings. Strategies to achieve ISO Certification for the laboratories were also being implemented while commercialization is expected to efficiently utilize existing and excess capacity.

A Human Resource Strategy has been formulated as mandated by the overall Strategic Plan of 2005-2015. This strategy presently being implemented determined the key issues in staff numbers, staff quality and their expected outputs and in its implementation will provide for the essential human resource components namely: performance management, motivation, and corporate culture.

To achieve sustainable stakeholder relationships, stakeholder relationships are embodied in KARI's strategic plan. Consultations, discussions, collaborations, Memorandum of

Understanding (MOU's) and Centre Research Advisory Committees (CRAC's) are some of the strategies instituted to manage stakeholder relationships.

The government and donors still fund KARI's strategies with a sizeable proportion of research expenditure being funded by the donors. Measures to achieve financial sustainability are geared towards reducing dependency on donors and include enhancing internal revenue generation. This is being achieved through the Agricultural Research Investment Services (ARIS) unit which has the mandate of spearheading commercialization activities and consultancy services. Enforcement of intellectual property rights is also expected to bring sizeable revenue as KARI is a primary producer of technology which if patented can be financially exploited. The setting up of an endowment fund is in the initial stages, this is after the successive implementation of a pilot Agricultural Research Fund by KARI on behalf of the National Agricultural Research Systems (NARs) affiliates.

5.1.2 Challenges in Implementing these Sustainability Strategies

KARI is facing various challenges while implementing these strategies. It lacks adequate financial resources to maintain its capital assets as the government's allocation for this purpose is never adequate. Similar efforts to bring their laboratory facilities face the same challenge. Repossessing previously grabbed land and acquiring title to all of their land has legal technicalities and processes that will take time to sort out.

The uncompetitive Terms and Conditions of Service is a major factor leading to low staff motivation and loss. The implementation of the Human Resource Strategy has financial commitments that are not readily available.

For stakeholders, conforming to the myriad of conditions set by the different donors is a major challenge in addition to ensuring smoother flow of donor funds from the donors to KARI for onward transmission to research activities. Other stakeholder relationship challenges include dealing with perceived misconceptions and envy and managing the frequent changes in the leadership of different ministries that work hand in hand with KARI.

Finally the financial sustainability strategies major challenges is orienting the institute's resources both capital and human to the commercialization efforts while at the same not moving away from the public good nature of their mandate. In addition to this research scientists are not skilled in generation of money; this aspect is greatly affecting their efforts to achieve this objective. The governments support in legitimizing intellectual property rights and the formation of the endowment fund are taking longer than expected; while consultancy services are not well institutionalized so them to reap their full potential.

5.2 Conclusion

The sustainability concept if fully conceptualized and implemented can largely improve the performance of organizations and increase their capability to achieve the core

business. This is more important in public sector organizations whose activities are controlled and directed by the government in its quest to provide public goods and services.

There is an urgent need to for public sector institutions to improve their management capabilities by embracing modern practices and having a private sector value for money outlook to ensure they deliver. Important also is the ability to determine and control their destiny for this makes them deliver what they were established for, survive changes in government policies especially on self dependency and more important have a futuristic view of efficiency in management of taxpayers money.

KARI faces unique problems in that it provides public goods that require large financial resources and cannot apply profit making management practices. It is notable and commendable that KARI has taken the right steps towards achieving their mandate despite the problems afflicting them and in this are tackling the sustainability concept headlong. A lot still needs to be done to achieve this goal, this will take time but the seeds have been sowed.

5.3 Recommendations for Further Research

The study found that much of the strategies being implemented are at the initial implementation stages, a study could be done after some period of time to find out their success and impact.

This being a case study, the research findings can not be used to make generalizations on the agricultural research sector. A study could be done on other research institutions in the country and in the region for both indigenous and international ones located here in Kenya like ICIPe, ILRI and ICRAF to see they have dealt with this problem and thus allow industry generalizations.

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Appendix 1

**Questionnaire on a Study on Sustainability Strategies Adopted By
Kenya Agricultural Research Institute (KARI)**

Questionnaire No.:-----

Date: -----

Part A: Respondents Personal Information.

Department of respondent-----

Designation of respondent-----

Period spent in KARI-----

PART B: Assessing the Current Situation.

1. Does KARI have long term strategy (ies). Yes [] No []

a) If yes,

i) What is/are the current strategy(ies). Please explain.

ii) How are the strategy(ies) formulated. Please explain.

b) If No what is in place currently? _____

2 How is the research agenda set? Please explain

3. Is the research agenda linked to the long term strategy(ies)? Yes | | No | |

a). If yes, how? Please explain. _____

b) If No, how is the research agenda dealt with in the in the long term? _____

PART C: Organizational Sustainability Strategy.

1 Does KARI have adequate capital assets like buildings, land, facilities etc.

Yes [] No []

a). If yes,

i) Are they utilized well presently? Please explain. _____

ii) Does KARI have strategies to ensure their continued use and future availability? Please explain. _____

b) If No, are there strategies to ensure their availability and use in future? Please explain. _____

2. Does KARI have adequate human resources to achieve its research agenda or implement its strategy(ies).

Yes [] No []

a). If Yes does KARI have strategies to ensure their future availability in the right mix of skills, competence and quantity? Please outline them. _____

b) If no,

i) What caused or causes this gap in desired vs available human resource requirements? Please explain. _____

ii) Does KARI have strategies to address the problem? Please outline them. _____

3. Who are KARI's stakeholders? Name them. _____

4. How is KARI's relationship with its stakeholders? Please explain. _____

5. Does KARI nurture its relationship with its stakeholders? Yes [] No []

a)

i) If yes, how? Please explain. _____

ii) Does KARI have strategies of nurturing its relationship with their various stakeholders in future? Please outline them. _____

b) If no, why? Please explain. _____

PART D: Financial Sustainability Strategy

1. Whose mandate is it to finance KARI's strategy(ies)/agricultural research? _____

2. Does the one responsible adequately finance KARI's strategy(ies)/agricultural research?

Yes | | No | |

a) If Yes, how does he go about it? _____

b). If No

i) Please explain why. _____

ii) How has KARI dealt with the problem? _____

3. What role has the government played in funding KARI's strategy(ies)/agricultural research? _____

4. Can you classify the government's role as dependable, stable and sustainable?

Yes [] No []

a) If Yes, Please explain _____

b). If No

i) Please explain why _____

ii) How should the government then be playing its role? Please explain _____

5. What role has the donors played in funding KARI's strategy(ies)/agricultural research? _____

6. What programmes do they fund? Please outline them. _____

7. Are their funding areas in line with KARI's strategy(ies)/agricultural research? _____

8. Can you classify the donor's role as dependable, stable and sustainable?

Yes [] No []

a) If Yes, briefly explain _____

b). If No

i) Please explain why _____

ii) How should the donors then be playing their role? Please explain _____

9. What other ways does KARI fund its strategy(ies)/agricultural research? Please explain _____

10. What strategies has KARI instituted to ensure financial sustainability? Briefly outline them. _____

11. Are these strategies bearing fruit? Briefly explain _____

PART C: Challenges in Implementing of strategies.

1. What problems is KARI encountering in its efforts to ensure adequate capital stock in future? Please explain. _____

2. How is KARI dealing with these problems? _____

3. What problems is KARI encountering in its efforts to ensure sustainability of its human resources? Please explain. _____

4. How is KARI dealing with these problems? _____

5. What problems is KARI facing in its efforts to nurture good relationships with its stakeholders? Please explain. _____

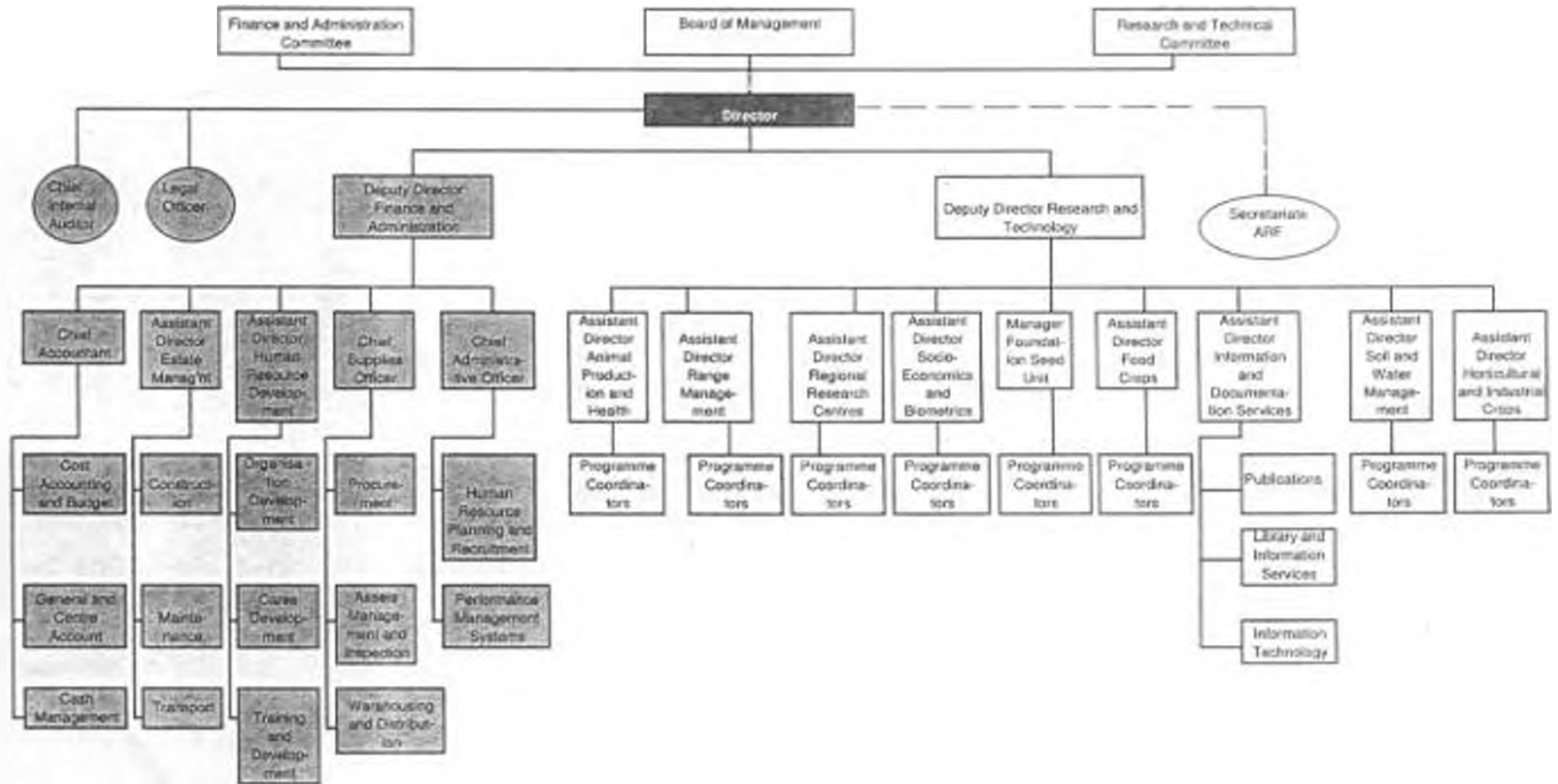
6. How is KARI dealing with these problems? _____

7. What problems is KARI facing in ensuring financial sustainability? _____

8. How is KARI dealing with these problems _____

Thank you for accepting to fill in the questionnaire.

Kenya Agricultural Research Institute Organisational Structure



Appendix 2.