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Determinants of Sustainability for Fish Farming Project Initiative under the Economic Stimulus Programme in Kenya - A Case of the Central Constituency of Kirinyaga County

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Abstract

This study explored the determinants of sustainability for fish farming project initiative under the economic stimulus programme in Kenya. The specific objectives for this study were: project strategies, implementation process, a availability of capital and support services. A descriptive research design was used and both qualitative and quantitative were explored in this study. Stratified random sampling technique was used to select this sample from each stratum and data was collected using instruments which were open and closed-ended questionnaires. A pilot test was conducted on 10% of the respondents to test the instruments for reliability and validity. Data was analyzed with the help of SPSS version 21 To ensure sustainability of fish farming, this study recommends that only areas with enough water resources and enough raw for the manufacture of fish feeds should be considered for fish farming. Fish feed is the most expensive component in fish farming the world over and this study also reaffirmed that it was among the major determinants of sustainability of fish farming. This study therefore recommends that the national government may partner with County governments and address how to make fish feeds affordable and readily available to farmers.

Keywords: *Project strategies, implementation process, availability of capital and support services*

Introduction

Agricultural production in many developing countries in the world is generally characterized by the predominance of small farmers whose landholdings are often fragmented and average less than one hectare in size. Land owners often live below the poverty line and therefore have very little resources to sustain their farming operations without external assistance (Nordmeyer, 2014). Such assistance has been essentially provided in the form of support services, mainly by the government and to a varying extent by private sector and NGOs as part of their community development activities. On the government side, support services such as farm inputs, research and extension, credit and marketing are mainly provided by various agencies under the relevant agriculture ministries (Omolo and Bowman, 2007).These services are extended either as part of the regular function of an agency like the extension department or as components of special programs that address particular areas or concerns such as poverty alleviation or integrated rural development programs. Because of the many entities/agencies involved in agricultural/rural development, inter-agency coordination needs to be continually strengthened (APO, 2013)

Global and Regional Perspective of Sustainability of Fish Farming

Fishing is one of the oldest economic occupations of mankind and it is carried out for subsistence and commercial purposes. In developed countries like Canada, it is highly commercialized while in developing countries it is mainly carried out for subsistence purposes. Fishing is carried out along various coastlines, in enclosed seas and in inland fresh waters (Olander and Persson, 2004). The main fishing grounds of the world are located in the waters of Pacific and Atlantic coasts within the temperate latitudes of northern hemisphere. Each account for 40% of the world annual total fish products while Indian Ocean account for about 4% while aquaculture account for about 15%. Fishing in rivers and oceans has increased over the years due to improved technology and this led to over-fishing and caused a decrease in wild stocks. Therefore, the need to increase fish production by farming became necessary (Price & Egna 2014).

Regional Perspective of Sustainability of Fish Farming

Aquaculture was introduced to Sub-Saharan Africa in the 1950s with the objectives of improving nutrition in rural areas, generating additional income, and diversification of activities of employment creation in rural areas to reduce the risk of crop failures Price and Egna, 2014). Aquaculture has grown strongly in most regions of the world where the potential exists but although the African continent has the potential for fish farming, much has not been

realised in Sub-Saharan Africa where returns on government and international aquaculture investments appear to be insignificant (Mwangi, 2008).

Small farmers, especially in the rain fed areas, are faced with constraints in the production process, in access to inputs and credit, marketing and value addition. Their production level is limited by the small size of their holdings, weaknesses in the land tenure system and unequal access to irrigation water (Ngugi, Bowman, and Omolo, 2007). They often encounter difficulty in procurement and application of modern technologies because of the high cost and greater risk involved. The various constraints stem mainly from limited land area, low levels of farm output and income and very little net surplus. Consequently, there is an extremely limited possibility for farm investment out of farmers' own resources. The rural markets do not function in a way that is favourable to small farmers since they do not receive timely market information and therefore experience considerable difficulties in accessing government services such as extension (APO, 2013).

Local Perspective of Sustainability of Fish Farming

The Kenyan Aquaculture Sector has operated without a comprehensive policy and legal framework since independence (Mwangi, 2008). However, various policy statements and guidelines have been articulated in order to streamline the sector but none of these documents have adequately articulated the overall legal framework that is effective and efficient in management, development and research so as to enable the harnessing of the potential in aquaculture (ACP, 2011).

The government of Kenya launched a Kshs22.06 billion National ESP through a budgetary document entitled: 'Overcoming Today's Challenges for a Better Kenya Tomorrow'. The aim was to rehabilitate collapsed projects in various sectors and also to initiate other short and medium term, high intensity and high impact projects (Ngugi et al., 2007). Resources were to be invested to bear short term and long term benefits to stimulate the growth of Kenyan economy through rapid creation of jobs and business opportunities. Some of the activities covered under ESP included expansion of irrigation based agriculture, construction of wholesale and fresh produce markets, fish farming in ponds and Jua-Kali sheds.

The Specific objectives

a.To find out how project strategies determine sustainability for fish farming project initiative under the economic stimulus program in Kenya

b.To establish the effects of the implementation process as a determinant of sustainability of the fish farming project initiative under the economic stimulus program in Kenya

c.To examine how availability of capital determine the sustainability of the fish farming project initiative under the economic stimulus program in Kenya.

d.To establish the extent to which support services determine sustainability of the fish farming project initiative under the economic stimulus program in Kenya

Conceptual Framework

According to Shields and Rangarjan (2013), a conceptual framework is the way ideas are organized to achieve a research project's purpose. It is an abstract representation connected to the research project's goal and it directs the collection and analysis of data (on the plane of observation: the ground). The independent and dependent variables guided the development of the conceptual framework. Figure 2.2 shows an illustration of the conceptual framework for the study.

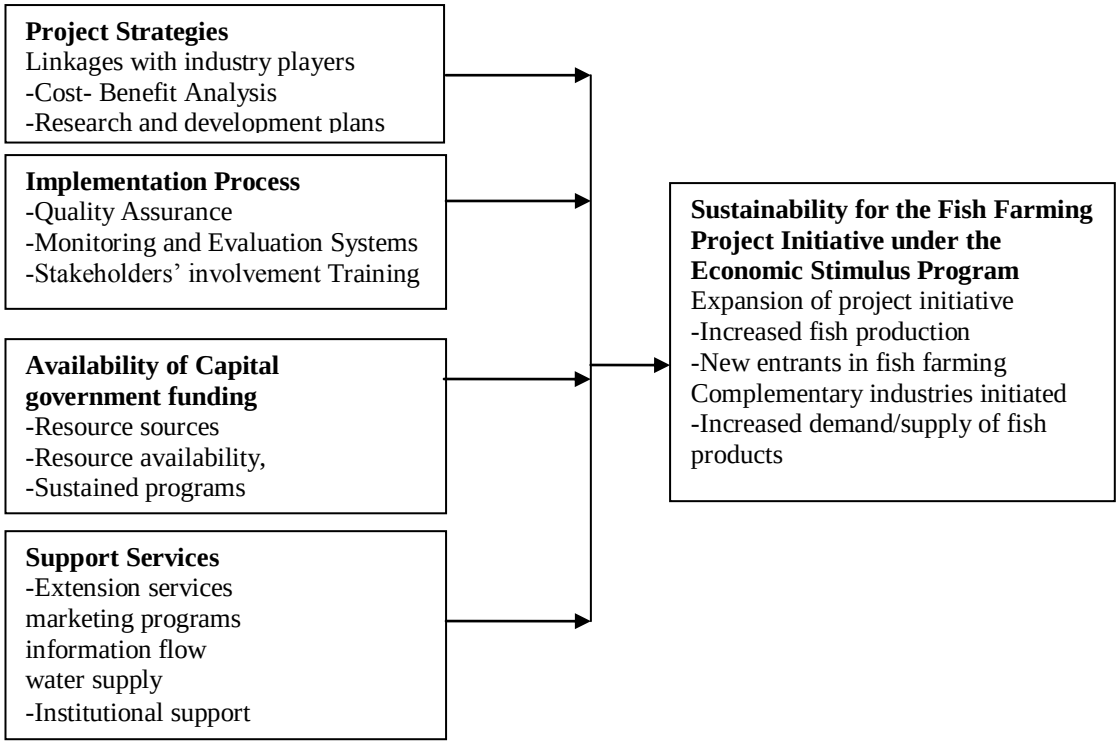

Figure 2.1

Project Strategies

According to ROK (2009), the Kenyan ESP was first introduced in the 2009/2010 Budget Speech in parliament with the aim of jumpstarting the national economy towards long term growth and development. This was after the 2007/2008 post-election violence that had affected the Kenyan economy, prolonged drought, a rise in oil and food prices and the effects of the 2008/09 global economic crisis. The ESP became necessary in Kenya due to the decline in the economic growth rate from 7.1% in the year 2007 to 1.7% in the year 2009.

According to the findings of Ngugi *et al* (2007), fish farming in Kenya, using ponds began as early as in the 1920s. Their findings revealed that the government popularised aquaculture in 1960s through the "eat more fish" campaign. As a result, Tilapia fish farming expanded substantially with the construction of many small ponds. However, this initiative failed in 1970s mainly because of inadequate extension services, lack of quality fingerlings and insufficient training of extension workers. By 1990, small scale fish farming was characterized by small size ponds and low levels of production. According to Gitonga *et al* (2004), Kenyan aquaculture was carried at different levels from small hand-dug kitchen ponds for subsistence to other improvised containers used for water storage and stocked with fish which were then harvested periodically.

The findings of studies by Howard *et al* (2007) showed that fish farming in Kenya is still under developed and the annual production was about 1,000 tonnes. Some regions in Western Kenya, where fish farming had pioneered, some farmers had abandoned fish ponds due to various reasons. Although Kenya is still faced with many challenges, development of aquaculture can play a leading role in poverty reduction, and also as a source of alternative fish instead of relying on natural ecosystem which is declining (Gitonga *et al*, 2004).

Implementation Process

Marcus (2005), it is an accepted wisdom that to be sustainable over the long term, projects must deliver benefits through a viable institutional mechanism, and those benefits must be in sufficient demand to generate the resources needed to sustain that institution. Identifying such a combination five or more years before the desired outcome is a daunting challenge (Omolo, & Bowman, 2007). The planner is usually an outsider with a big stake in getting the project identification accepted, and perhaps even designed, by the various actors although he is rarely responsible for implementation. He continues to argue that of all the stages in the development investment cycle, it is during project identification, when the basic outline is set, that the most substantial impact on sustainability can be made. Making changes later is difficult and development managers should understand the factors that promote sustainability so that they can make good judgments at the start about what resources to source for. Incorporating a concern for benefit sustainability into the project at the identification stage involves a number of aspects which

include a strategic perspective and recognition that the focus on benefit sustainability is crucial to the effectiveness concerns of any project (Olander & Persson, 2004

Availability of Capital

While defining project management terminology, Turbit (2005) says that resources are all the items that are required to carry out the project activities. They include people, equipment, facilities, time, money, or anything else required for the completion of the project. All these elements are inter-related and linked to the scope of the project. Each of them must be estimated and managed effectively if the project was to be a success in the long run.

Historically, project effectiveness has been measured in terms of benefits at the end of the project funding cycle, with observable benchmarks along the way to achieving these benefits. Research has shown that this definition of 'end' has been shortsighted. Projects frequently stop delivering the desired benefits as soon as the money runs out because benchmarks were defined only in terms of effectiveness, neglecting institutional aspects concerning the capacity to sustain the delivery of benefits after donor funding ends (Marcus, 2005).

Support Services

Sharma (2012), Country presence and policies supporting direct supervision have a significant potential to increase the sustainability of programs. In addition to considering the quality of implementation support, the establishment of institutional relationships, and fiduciary aspects such as procurement review and loan contract administration, the supervisory and support missions should be focused on various aspects of programme design and Monitoring and Evaluation (M&E) that are likely to have a direct influence on the sustainability of projects. He adds that while it is important that supervisory missions are adapted to the specific project context and type of activities implemented by the country, it is critical that future missions follow by adopting a more specific focus on sustainability. Sharma (2012) concludes that Government-provided agricultural support services need to be tailored to enable small farmers to take up commercial farming through sustainable practices. Empowerment of farmers implies undertaking land reforms, ensuring equitable access to irrigation water and its efficient management and promotion of watershed development with community participation in dryland rain fed areas. Extension services need to be radically restructured to make technology dissemination responsive to small farmers. Innovative institutional arrangements would need to be evolved to make the extension system farmer-driven and farmer accountable(Ringa and Kyalo,2013).

Sustainability of Fish Farming Project Initiative

Rizk (2012), sustainability is a very important factor and must clearly be addressed as a project requirement during the design and inception of any project. It is vital for project sponsors to ensure that any project is able to continue beyond the initial interventions and resources employed to it in order to successfully enter into an agreement with the client or beneficiaries (Saunders, Lewis & Thornhill.,2009). It gives the overall definition of what the project is supposed to accomplish, and a specific description of how the end result should be accomplish and continuity assured. A major component of sustainability is the quality of the final product and the amount of time put into individual tasks to determine the overall quality of the project and it can continue beyond the initial interventions. Project tasks require a given amount of time to complete adequately but more time should be devoted into coming up with strategies to ensure sustainability. Over the course of a large project, quality can have a significant impact on time and cost requirements (Ringa & Kyalo,2013).

Research Design

A descriptive study design, which involves a systematic collection and analysis of data, was used for this study. This type of design helped the researcher to obtain information, describe and present a picture of a phenomenon that was under investigation and involved measuring the variables as they existed naturally. It aimed at describing single variables and obtained separate description for each (Mugenda and Mugenda, 2003). This design enabled the researcher to describe responses to questions about the phenomenon or situation with the aim of understanding the respondent's perception from which truism was constructed. This was based on the constructivist epistemology which holds that reality is what the respondents generally perceive it to be

Response Rate

In the results, shown on table 2.1, after giving the instruments to the respondents the filled and returned questionnaires were 88.9 % (79).This is in line with Mugenda & Mugenda (2003), a response rate of 50% is adequate, 60% is good and 70% and above is very good. Based on this, the response rate for the study was very good. This response rate was achieved because the researcher personally administered the questionnaires and later made follow-ups on respondents to whom the questionnaires were served.

Table 2.1 Reliability Test

Item measured	Number of items	Cronbach's Alpha (α)
Project strategies	10	0.731
implementation process	10	0.752
Availability of capital	10	0.711
support services	10	0.814
Sustainability of Fish Farming	10	0.781

Research and Development Services for Fish Farmers

Asked whether they were provided with updates on any research and development services, 68% (56) was the combined number of those who either disagreed or strongly disagreed while 20% (16)were non-committal. This was a total of 91% (72) which leaned from neutral to strong disagreement in their responses. These findings were in agreement with those of Kimathi *et al* (2013) that access to technical information and lack of adequate extension services were some of the major shortcomings of fish farming in Kenya. It also indicated that the three year sustainability program proposed by RoK (2009) was never implemented. A summary of responses on this variable (refer table 2.2).

Table 2.2 Strategies for Fish Farming Initiative and Sustainability

Item	Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %	Min	Max
Fish Farming objective was good		2.0	2.0	73.0	23.0	1.00	5.00
Sustainability planning done	12.0	62.0	13.0	10.0	3.0	1.00	5.00
Linkages created	60.0	19.0	12.0	1.0	8.0	1.00	5.00
Benefits are higher than costs	28.0	53.0	11.0	6.0	2.0	1.00	5.00
Research and development Services available	3.0	68.0	20.0	4.0	5.0	1.00	5.00

Fish Species and Sustainability of Project Initiative

Opinion on whether the species of fish supplied to the farmers during the initiation of the project had an effect on the sustainability was divided almost equally with 48% acknowledging that the tilapia breed stocked into the ponds had problems of over breeding and did not grow to the required marketable sizes. The rest, 49%, responded that the species provided was good for the project. The study established that most of those that were happy with the species were the ones whose ponds were still active and who had achieved a good initial harvest when the feeds were provided by the government. The pattern of responses on the effect of fish species on sustainability (refer table 2.3).

Table 2.3 Fish Species and Sustainability of Project Initiative

Question	Response	Frequency	Percent	Cumulative Percent	Mean
Fish species determine sustainability?	No	49	49.0	50.5	3.3714
	Yes	48	48.0	97.0	3.5500
	Unspecified	3	3.0	100.0	
	Total	**100**	**100.0**		

A stepwise regression model which determined how each of the variables affected the sustainability of the fish farming initiative is shown in table 2.4 All unstandardized beta coefficients were significant, indicating a positive contribution of all the independent variables to the dependent variable. The unstandardized beta coefficients also showed that availability of capital resources ($\beta = 0.413$) was the main determinant of sustainability of the fish farming project, followed by availability of advisory/support services ($\beta = 0.319$), implementation process ($\beta = 0.301$) and project initiative strategy ($\beta = 0.219$) in that order. All the variables were significant with p-values < 0.05. Availability of capital resources is shown by the regression analysis as having a value of 'T' which is 6.855 and p-Value is 0.018 at 95% level of significance.

Table 2.4 Linear Regression Model

Model	Unstandardized Coefficients, β	t	p-value
(Constant)	-2.119		
Project Strategy	0.219	5.749	0.001
Implementation Process	0.301	6.414	0.021
availability of Capital	0.413	6.855	0.015
Support Services	0.319	6.610	0.019

Conclusion

The main determinant to the sustainability of the ESP fish farming project initiative was found to be availability of capital resources. The government had initially provided free fish fingerlings, free construction labour and fish feeds to the project beneficiaries for the first six months after the ESP projects were initiated but this sustained in succeeding years. A reasonably large majority 76.7% (61) of the respondents disagreed that fish feeds were available locally and when available elsewhere, 85.8% (68) of the respondents indicated they could not afford it. The overall effect of the variables showed a great influence of all the four variables as determinants of sustainability for the fish farming project initiative under the ESP. A test of overall significance of all the four variables jointly; project strategies, project implementation process, availability of capital resources, and availability of advisory/support services using ANOVA, at 0.05 level of significance found the model to be significant to the study.

In order to realize the original goal of the ESP fish farming project initiative, this study would recommend the following: determinants of sustainability for fish farming project initiative under the economic stimulus programme in Kenya. This would ensure sustainability of fish farming, in the areas with enough water resources and enough raw for the manufacture of fish feeds should be considered for fish farming and the national government to partner with County governments and address how to make fish feeds affordable and readily available to farmers. The capacities of the fisheries departments in the Counties with high potential for fish production may be improved to enable them to extend their research activities and extend skills to farmers. This in turn will enhance fish production by farmers and meet demand for fish products. Benchmarking could be carried out on successful aquaculture performs in other constituencies in Kenya and replicate the best practices so as to make fish farming more sustainable.

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