

# Influence of Research and Development on Performance of Fish Farming Economic Stimulus Projects in Kenya

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**Abstract:** The main objective of this study was to establish the influence of research and development on performance of fish farming economic stimulus projects in Kenya. The study adopted a mixed methodology approach where both quantitative and qualitative research methods were used. This target population was spread in the twelve sub-counties of Kiambu County. They were chosen according to their roles, profession and activities in fish farming enterprise. Quota sampling method was used to help specify the target group by dividing into the above listed groups. Primary data was gathered by use of a semi structured questionnaire and captured through 5-point type Likert scale with close-ended questions. The researcher used self-introduction letters, codes and delivered the questionnaires to the respondents and then made use research assistants who followed up on completed questionnaires. The researcher also followed up the progress through meetings, telephone calls and emails. Data was presented in forms of tables, bar graphs and pie charts. Most of the respondents agreed that there were available simple manuals, brochures on fish health and nutrition.

**Keywords:** Research, Development, Fish Farming, Performance.

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## 1. INTRODUCTION

The decline of fish production from the natural water resources due to growing human population has led to high demand for fish in Kenya .hence the development of fish farming (aquaculture) is inevitable as demand for seafood products increase through population growth. It is also evident that the rising protein needs of an expanding world population will not be met by tradition capture fisheries (Njue J 2015). Worldwide, Aquaculture has an overall growth rate of 11% since 1984 which has made it to be the world's fastest growing food-producing sector. World fisheries statistics show that the world's demand for fish and seafood has exceeded the levels that hunting and gathering wild fisheries can support. Research shows that aquaculture accounts for over 50% of the entire worldwide seafood supply. Projections shows that at least an additional 40 million tonnes of aquatic food will be required by 2030 to maintain the current per capita consumption worldwide. Aquaculture has thus drawn increasing attention from many quarters as a modern culture practice in both developed and less developed countries (Hopkins, 1995 ;).

In Kenya Fish aquaculture started in the 1920s with the arrival of European settlers and was more confined to recreation purposes. Fish culture as a means of producing a source of protein for rural indigenous population began in the late 1950s and early 1960s (Otieno and Campbell, 1995). This was followed by small ponds, subsistence-level management, and very low levels of production (Ngugi et al, 2008). Other than being a supply of proteins, Adoption of aquaculture has proved to be a source of income generating since it has offered self-employment opportunity to farmers and has also created employment to other people. In 2009 the government of Kenya came up with Economic stimulus program in

fisheries Development intended to improve nutrition and create over 120,000 employment and income opportunities. It was perceived to be one of the core entrepreneur activities embraced by many citizens under the ESP (2009). To achieve this, 200 fish ponds were constructed in each of the selected constituencies at an estimated cost of Kshs. 8 million per constituency. The Ministry of Fisheries Development took a lead in implementing this project (Ibid, 2009). Kiambu County was one of the counties that benefited from the ESP programme. With the development of the ESP programme, many challenges have been realised that have hindered the performance of the programme which the study analysed and come up with solutions in Kiambu County.

## 2. STATEMENT OF THE PROBLEM

Aquaculture sector in Kenya contributes largely to the economy of Kenya since it's an income generating activity. Nyonje et al., 2011 states that current national aquaculture production, including harvests from the ESP and other private farms, is estimated to value \$21 million. This shows that aquaculture farming if taken into higher consideration can contribute to poverty alleviation in rural Kenya. Due to the economic benefit of the fishery sector in the country, the government decided to revamp the sector by introduction of Economic stimulus programme in fishery department. The programme was allocated 1.12 billion Kenya shillings for the construction of 28,000 fish ponds in 140 constituencies. The main aims of the project were to increase fish production, enhance food security, improve livelihoods of farmers, and provide employment for the youth (TISA, 2010). Despite the intervention by the government to revamp the fishery sector in the country, its performance has been dismal, probably due to challenges that were not factored out before the implementation of the program. This has led to stagnation and reduction of fish output which has made many farmers to abandon the fish ponds which leads to wastage of resources (Guya et al.) It is out of this concerns that the researcher was prompted to carry out the research on the influence of research and development on performance of fish farming economic stimulus projects in Kenya.

## 3. LITERATURE REVIEW

Aquaculture has continued to play an important role in supplying fish for human consumption and as an economic activity. With increasing depletion of fish stock and an increasing demand of sea food, research and development in aquaculture will be of paramount importance. This will enhance continued supply of fish to the population and a major economic activity to the farmers. For aquaculture to be profitable innovative technologies will have to be adopted which will reduce cost as well as increasing production of small scale operators who constitutes 80% of global fish farmers (Gupta, 2006).

Participatory research development is of importance because it helps to identify households, to assess their needs and resources, to assess whether aquaculture is appropriate and if so, to adapt technologies in conjunction with farmers (Edwards, 2000). International appreciation for participatory research development has grown (Reij & Waters-Bayer, 2000). Though there has been a challenge of funding farmer driven research hence disadvantaging farmers who were in remote places and cannot access the research institution or extension workers. The potential of aquaculture to reduce poverty and hunger has been recognised in Africa. However, growth in the sector has been limited, up-to-now, providing less than 2% of total fish production. In Eastern and Central Africa, the slow growth has been caused by a number of factors, including a development focus on poor farmers rather than small and medium enterprises, a lack of focus on the entire fish value chain (feed, seed, processing and marketing), as well as weak governance and policy environments.

For established aquaculture industries in developing countries, modern technologies are often slow to spread because of a bottleneck between the academic and research sector and the farmers and entrepreneurs out in the field. Once a technology is successfully introduced at the farmer level, it will frequently spread rapidly, but scientists and government managers can often fail to devise ways to cross that first important barrier successfully. In 2000 the government of Kenya identified aquaculture development as a core activity for funding during the preparation of the poverty reduction strategy paper. This followed the reorganisation of government functions where aquaculture became a core function of the fishery department. With the recognition of aquaculture the industry has been marked with increased research, training and private sector involvement.

In Kenya, research in aquaculture has been participatory, where the government and the farmers carry out research that meets the need of the farmers. The government also ensures access to government facilities and scientist on contract basis. Due to the participatory conducted research farmers are now fully aware for the benefits that accrue from using appropriate aquaculture techniques (Daramola, 2008). Non-governmental institutions also play a role by funding research work, disseminate research results when appropriate, evaluate research results and contribute towards setting research agendas.

National Aquaculture Research Development and Training Centre (NARDTC) - Sagana is the epicentre of fish health and nutrition research in the Kenya. Species specific successful health and nutrition technology trials at NARDTC are passed on to multiplication centres across the country that in turn ensures farmers gain on the same. Over the last 15 years, research on proximate analysis, anti-nutritional factors in fish feeds, feed conversion Ratio (FCR) and growth experiments have been undertaken and results published in internationally peer reviewed journals. Growth experiments utilizing locally available fish feed ingredients has been experimented, documented and published. Fish health and nutrition simple farmers manuals, facts sheets, brochures and posters have been developed in collaboration with the training and extension division. The main focus of NARDTC Sagana fish health and Nutrition division is to conduct demand driven research aimed towards improving on fish feed quality at a reasonably low cost to farmers.

Other major Government Aquaculture Research Institutions are: Kiganjo Trout Farm at Sagana, Nyeri District, Central Province, Moi University, Department of Fisheries, Eldoret, Uasin Gishu District, Rift Valley Province and Kenya Marine and Fisheries Research Institute, Mombasa District, Coast Province.

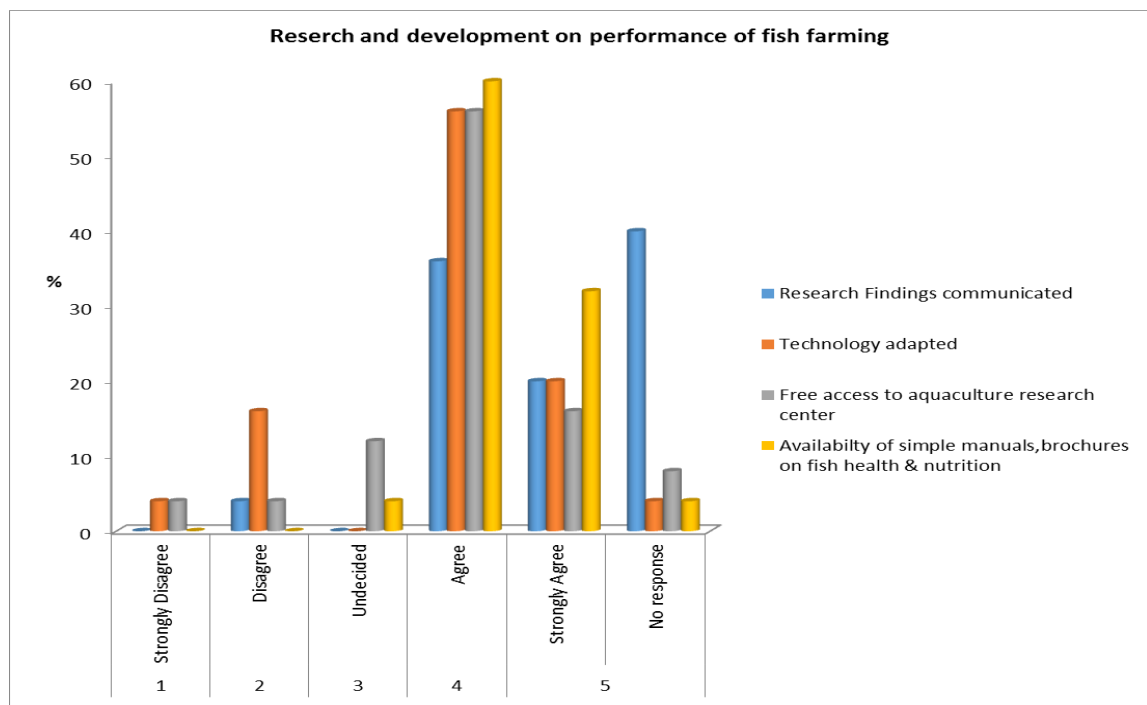
#### 4. RESEARCH METHODOLOGY

The study adopted a mixed methodology approach where both quantitative and qualitative research methods were used. This target population was spread in the twelve sub-counties of Kiambu County. They were chosen according to their roles, profession and activities in fish farming enterprise. Quota sampling method was used to help specify the target group by dividing into the above listed groups. Primary data was gathered by use of a semi structured questionnaire and captured through 5-point type Likert scale with close-ended questions. The researcher used self-introduction letters, codes and delivered the questionnaires to the respondents and then made use research assistants who followed up on completed questionnaires. The researcher also followed up the progress through meetings, telephone calls and emails. Data was presented in forms of tables, bar graphs and pie charts.

#### 5. FINDINGS

Table 1: Research and development on performance of fish farming.

Research and development on performance of fish farming														
	1		2		3		4		5		No Response		Total	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Research findings communicated	0	0	1	4	0	0	9	36	5	20	10	40	25	100
Technology adapted	1	4	4	16	0	0	14	56	5	20	1	4	25	100
Free access to aquaculture research center	1	4	1	4	3	12	14	56	4	16	2	8	25	100
Availability of simple manuals, brochures on fish health & nutrition	0	0	0	0	1	4	15	60	8	32	1	4	25	100
<b>Total</b>	2	2	6	6	4	4	52	52	22	22	14	14	100	



**Figure 1: Research and development on performance of fish farming**

Most of the respondents (60%) agreed that there were available simple manuals, brochures on fish health and nutrition. Technology was adopted with 56% of the respondents affirming the same. Reliability of information sources is an important issue in adopting new knowledge. Internet and mobile phones were the ICT tools used by fish farmers. The farmers (56%) agreed that they had free access to aquaculture research centre. Only 36% received a communication on the research findings.

## 6. CONCLUSION AND RECOMMENDATIONS

In conclusion, this study shows that implementation of fish farming under ESP is greatly influenced by the county government's efforts to improve delivery and fish management, farmer's education (training) leading to improvement in their management levels hence improved production per unit area. The free and available extension services help in providing technical skills, however, there need to involve NGO's in training services.

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