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Type of the Paper: Research Paper.

Type of Review: Peer Reviewed.

Indexed in: worldwide web.

Google Scholar Citation: [IJSTER](#)

How to Cite this Paper:

Ongaro, K., (2018). **Gender Dynamics in Participatory Fish-Farming toward Sustainable Community Development in Kisii County, Kenya.** *International Journal of Scientific and Technological Research (IJSTER)*, 1 (1) 16-26.

International Journal of Scientific and Technological Research (IJSTER)

A Refereed International Journal of OIRC JOURNALS.

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ARTICLE INFO

Received 14th July, 2018

Received in Revised Form 4th September, 2018

Accepted on 29th September, 2018

Published online 7th October, 2018

Keywords: Gender dynamics, Fish farming, Sustainable Community development, Kisii County

Abstract

Mainstreaming gender equity in participatory fish-farming is important in the attainment of protein food security, reducing poverty and improving food security in Kisii County. There are various permanent rivers in Kisii County, but fish farming was not commonly practiced as the alternative source of the traditional protein food. People depended on fishing from the common water bodies accessible from their neighborhood, which was limited. The study was based on the problem whose statement was that women and the poor people lacked an enabling environment for participatory fish-farming toward protein-food security

and sustainable community development in Kisii County. The study was guided by the following specific objectives: 1. Assess gender dynamic-issues in participatory fish-farming toward food security and sustainable community development in Kisii County; 2. Examine ways of building women's capacity to strengthen participatory fish farming in Kisii County; and 3). Explore ways to increase monitoring, evaluation and responsiveness in gender-based participatory fish farming in Kisii County. Literature relating to gender equality and community capacity building for participatory fish farming was reviewed. The study used descriptive survey method, and used purposive cluster sampling method to select 160 respondents out of the population of the study. The study findings revealed that fish farming as an alternative source of protein food has the potential of safeguarding food security in the face of climate change challenges. But fish farming was administered under the public department of fisheries, and the method used was mostly top-down approach of disseminating information for improved fish farming. Therefore, there was room to promote gender-based participatory fish farming toward food security and sustainable development in Kisii County. The study recommended that the leaders need to develop and implement a policy guide to promote participatory fish farming, including participation of women and poor household members in decision making, management and improvement of fish farming. Women and the vulnerable members of the society also need to be ready and willing to be empowered to participate in fish farming as alternative source of protein food.

1. Introduction

Mainstreaming gender equity in participatory fish-farming is important in the attainment of protein food security, reduced poverty and improved health in Kisii County. This is even more real in the face of climate change challenges in the rural communities that practice traditional subsistence farming and have the potential for fish farming. Women and poor fish farmers need to be empowered to take greater control of their fish-farming practices, thereby making it

sustainable (Myers, 1999). But this process is faced with challenges of limited resources, time and commitment by the public and civil society institutions to empower local fish farmers, alienating them from the development process (Farm Africa, 2016). This includes the aspect of capacity building to enable women and poor people to have decision making power over the day-to-day running of fish farming activities (Kimathi, et al, 2013).

There are various permanent rivers in Kisii County, but fish farming was not commonly practiced as the alternative source of the traditional protein food. People depended on fishing from the common water bodies accessible to the people in Kisii County, which was limited in quantity as many people exploited them with minimum control measures. Women and poor people do not have indigenous skills to rear fish, hence there is need to build capacity of women and poor people to rear fish. But this was hindered by limited resources, personnel, market creation and participatory planning (Kimathi et al, 2013). It is within this context that this paper is set to analyze gender dynamics in participatory fish farming toward protein food security and sustainable community development. The dynamic issues addressed in the paper include capacity building and empowerment of women and poor people, gender equity and accountability, and participatory responsibility in monitoring and evaluation of fish farming activities.

Problem statement: This paper was based on the study whose main objective was to assess gender dynamics in participatory fish-farming toward sustainable community development in Kisii County, Kenya. The study was based on the problem whose statement was that women and the poor people lacked an enabling environment for participatory fish-farming toward protein-food security and sustainable community development in Kisii County. According to Jacobi (2013), Shitote et al (2012), and Kimathi et al, (2013), there was need to create an enabling environment for the public leaders and extension officers to build the capacity of women and local poor people to enable them actively participate in fish farming activities. Since the government of Kenya and development partners had put significant effort and resources in fish farming program to promote protein food security, it was cxhjp to assess gender dynamic issues relating to participatory fish farming. This is important because women are traditionally responsible for access and preparation of the household food, necessary for improved nutritional health condition among women and poor people.

Aim and Objectives: This research aimed to assess gender dynamic issues pertaining to participatory fish-farming toward protein-food security and sustainable community development in Kisii County. The study was guided by the following specific objectives: 1. Assess gender dynamic-issues in participatory fish-farming toward food security and sustainable community development in Kisii County; 2). Examine

ways of building women's capacity to strengthen participatory fish farming in Kisii County; and 3). Explore ways to increase monitoring, evaluation and responsiveness in gender-based participatory fish farming in Kisii County.

2. Theory and Literature on Gender Equity in Participatory Fish-farming

Theories provide conceptual frameworks on which phenomena and major community issues of interest like gender equity in participatory fish-farming can be understood and misconceptions dispelled. Concepts in gender equity entail resolving gender-based discrimination of people in their ability to influence decisions regarding fish-farming. Equal opportunity to participate in fish farming is very important in the process of sustainable community development. Therefore, this section of the paper addresses the theoretical perspectives of gender equity in participatory fish farming toward sustainable community development.

The concept of gender equity

According to Chege and Sifuna, (2006), gender refers to the people's social construction on the way to think, understand, act and behave as female or male members of the community. This includes aspects of how a person's biology is culturally valued and interpreted into locally accepted ideas of what it is to be a man or woman. Sex denotes the biological characteristics that categorize someone as having either a female or male biological body. Gender identifies the social relations between women and men. Its conceptualization is about the relationship between boys and girls, men and women, and how this is socially constructed. Gender roles are contextually unique in the specific community, and are dynamic as they change over time.

Gender equity is the result of the absence of discrimination on the basis of a person's sex in opportunities and the equal allocation of resources, benefits, access to services like capacity building and empowerment necessary for participatory fish farming. Gender equity entails the provision of fairness and justice in the distribution of benefits and responsibilities between women and men. The concept recognizes that women and men have different needs and power and that these differences should be identified and addressed in a manner that rectifies the imbalances between the sexes. The theoretical concept of 'Women and development (WID)' was developed in 1970s with an aim of integrating women in

development policy formulation, development planning and the practice of participatory fish farming. In 1980s, the concept of 'Gender and development (GAD)' was developed to eliminate socio-economic and political disparities between women and men in the process of sustainable community development (Chege and Sifuna, 2006).

2.3 Capacity building and empowerment for participatory fish-farming

Yousif (2006) posited that capacity building goes beyond the conventional development of human skills and institutions, to encompass ownership, partnership, networking, integration of knowledge and information, and involvement of women and the marginalized poor people in fish farming process. Donnelley, (2007) further postulated that, to empower women and the poor households in this perspective, more attention need to be given to the creation of an enabling environment in the social, political, cultural, institutional, regulatory and legal spheres. Yousif (2006) went on to cite the Agenda 21, which called for anchoring capacity building for participatory fish-farming and sustainable community development on the following principles:

1. Ownership: Participation of women and all other stakeholders in the capacity building program development, implementation, monitoring and learning.

2. Integration, equity and accountability: Integration of economic, social and environmental priorities in the programs of empowering women and the poor households for participatory fish-farming.

3. Cross-sectoral harmonization between capacity building agents, women and the poor households: Harmonious and collective efforts in empowering women and members of the poor households to make better decisions in participatory fish-farming.

4. Empowerment through information: Increased use of modern technology and communication among women and the poor households for participatory fish-farming.

5. Partnership and cooperation: Development of new forms of cooperation, such as decentralized cooperatives, and saving groups among women and the poor households for improved participation in fish-farming.

Most of the above principles are ideal in nature, as they can be investigated to establish possible gaps between theory and practice of participatory fish farming. One of the theoretical concerns of critical institutionalism is the politics of capacity building to empower women and the poor people, where Ribort (2009) presented the multiple ways in which power is distributed in the society's local institutions. This leads to inequality in decision making which affects participatory fish farming and other community development initiatives. On the same note, Hall et al (2014) pointed out how power has been denied to marginalize groups of women and poor people, and the way local power dynamics are used to manipulate decisions in fish farming activities. Hall et al (2014) further said that socioeconomic inequalities are caused by unequal distribution of development resources and misfortunes. This poses a challenge to the decentralized government, as women and the poor marginalized groups get less share of development resources and more share of misfortunes of climate change and food insecurity, as development actors pursue corrupt individual interests and gains (Helling, et al (2005).

2.5 Gender-based participatory monitoring and evaluation in fish-farming

Gender-based participatory monitoring and evaluation emphasizes the need of building the capacity of women and the poor people to be actively involved in all stages of planning, implementation, monitoring, evaluating, learning and reporting on participatory fish farming (Bayer & Waters-Bayer, (2002). This gives women and the poor people the ability and power to raise questions during monitoring and evaluation, as their participation in all stages of a fish farming projects creates a sense of local ownership. This means fish farming project beneficiaries should be involved throughout the conception, planning, implementation, monitoring and evaluation stages (Chambers, 2007). Participatory approaches allow for, among other things, the sense of fish farming project ownership on the part of beneficiaries and hence their full support. It also allows for real needs of the beneficiaries, from their own point of view, to be taken on board at all stages in the fish farming activities.

Monitoring is the systematic and continuous collection, analysis and use of information for management control and decision making during and after a development intervention (ITAD, 1999). Participatory monitoring involves women and poor people in monitoring fish farming activities in the

community. Both monitoring and evaluation need to be planned before the beginning of any fish farming project. Evaluation is a post-development assessment measuring whether planned objectives, outcomes and impacts have been realized. Therefore, it is necessary to first evaluate the process, then the output and outcomes, and finally the impact of participatory fish farming. Participatory evaluation advocates for involvement and participation of all community members and other development stakeholders in the design and execution of the evaluation process. This is important as it creates a sense of ownership, responsibility, commitment and empowers women and poor people to appreciate achievements made in fish farming toward sustainable development.

3. Methodology

3.1 Research Design: The study used descriptive method, with qualitative and quantitative approaches. Qualitative method was used to treat data relating to perceptions of the respondents relating to the gender issues in participatory fish farming toward food security and sustainable community development in Kisii County, Kenya. Quantitative method was used to collect and analyze quantifiable data on the need to promote women's participation in fish farming.

3.2 Population of the Study: The population of the study comprised of women social group members, professionals groups, community stakeholders and policy makers in the department of fisheries in Kisii County. The population was identified in a way that represented the geographical coverage in each of the Sub-counties in Kisii County. The available data estimated that there were about 1,600 fish farmers and fish-farming stakeholders in Kisii County.

3.3 Sample Size: A sample size of 32 respondents was sampled in each of the Sub-counties, making a total of 160 respondents. This sample size of about eight percent of the population was established based on considerations of research credibility, time factor and resources available for the research project.

3.4 Sampling Method: The population was sampled using purposive cluster sampling method. The clusters

were based on the sub-counties in Kisii County. Cluster sampling was used so that all the sub-counties were equally represented as independent clusters. Respondents were identified in each sub-county using the snow-ball method, and with reference from the records about the fish farmers in the area. The respondents were stratified to include women, poor households, professional groups, and community leaders in all the sub-counties. This was important in order to gain a balanced representation of the multidisciplinary stakeholders in Kisii County. Community stakeholders and the professional groups were selected using purposeful-chain sampling method, whereby, one member of a professional group guided to the next respondent. The respondents included a balanced number of women and men from each of the sampled sub-counties. The researcher applied ethical considerations during the research project.

The method of data analysis was based on the responses received during the interviews and those of the questions in the questionnaire. The qualitative data was analyzed by descriptive method. Data was collected and analyzed based on the research objectives which were reflected in the questionnaires. The procedure of analyzing the collected data was based on the responses of each question, which was tabulated and analyzed using Microsoft Word and Excel Computer programs.

4. Key Research Findings

4.0 Introduction

This section presents data analysis and key findings of a study on gender dynamics in participatory fish farming in Kisii County. Data analysis was based on the responses of each question in the questionnaire by the sampled respondents. The following is the profile of the sampled respondents and the analysis of data collected during the research study.

4.1 Place of origin of the respondents

The respondents were sampled from five sub-counties in Kisii County, Kenya. The following table presents data regarding the places of origin of the respondents, where the first five areas are in Kisii County. The respondents' place of origin is presented below:

Table 4.1: Place of origin of the respondents

Sub-county	Frequency	Percent
Kisii Central – Kisii County	32	10
Kisii South – Kisii County	32	10
Gucha South – Kisii County	32	10
Masaba South – Kisii County	32	10
Nyamache – Kisii County	32	10
Total	160	100.0

Source: Field data, 2018.

The study focused on balancing the number of respondents from the sampled Sub-counties in Kisii County, thereby purposively selecting the above five tabulated administrative Sub-Counties in Kisii County. Kisii County has nine Sub-counties, and the selection of the five Sub-counties was based on water availability and the potential for fish farming. In each of the sampled five Sub-Counties, 32 respondents

were sampled to participate in the study as tabulated above. The next section presents gender distribution of the respondents.

4.2 Gender Category of the respondents

The following table presents a summary of the gender distribution of the respondents of the study:

Table 4.2: Gender of the respondent

Gender/Findings	Frequency	Percent	Cumulative Percent
Male	72	45.0	45.0
Female	88	55.0	100.0
Total	160	100.0	

Source: Field data, (2018).

From the table above, there were 72 sampled male and 88 female respondents, representing 45 percent of male and 55 percent of female respondents. From the above table, the female respondents were slightly above half, at 55 percent. The study focused on balancing gender in sampling the respondents. But the study found out that more women were attached to agriculture with more fish farming potential than men, and more female-headed households had water supply and land space to practice fish farming but they said that they did not have the financial and technical ability to do it. This means there is more potential for policy and program development aimed at enabling poor subsistence farmers to be able to embrace fish farming toward protein food security.

1. Gender dynamics regarding innovations in participatory fish-farming

When asked if there were some recent innovations to enable participatory fish farming in the specific area, the respondents from the department of fisheries cited advancement in fish storage and processing plants that facilitated improved marketing of fish products. Further, 18 percent of the potential fish farmers said they had fish ponds installed through facilitation of public funds between the years 2010 and 2012 under vision 2030 flagship program. But they said when subsidized fish fingerlings and fish feeds were no longer provided under the vision 2030 flagship program; they were unable to meet the necessary expenses for fish farming. This forced them to convert their fish ponds into vegetable gardens as found in the qualitative data found on page eight. Further, when the respondents were given the following table seeking information on how the decisions of fish farming had been made, the following data was obtained.



Table 4.3: Fish farming decision making

Decision making in fish farming/response	All times	Mostly	Rarely	None at all
Women & poor people’s opinions heard and effected	5	12	76	67
Decisions made at project/public office only	44	73	32	11
Women, poor people, officials and leaders participate	37	36	71	16

Source: Field data, 2018.

From the above table, 76 (47.5 percent) of the respondents said that women and the poor people’s opinions were rarely heard, and 67 (41.9 percent) of the respondents said their opinions were not heard at all. This means that a total of about 89 percent of the respondents felt women and the poor people were not actively participating in fish farming decision making process.

The question on whether the respondents were happy with the way resources, like fish feed, were distributed was asked to follow up on fish farming decision-making in relation to participatory and accountable

management of fish farming resources. In response to this question, the respondents said that the subsidized fish farming inputs were no longer being provided under government’s subsidy to support fish farming, and even when they were being distributed the absolute-poor people were rarely involved in the decision making process.

When the respondents were asked what they thought had been the effects of fish farming productivity on protein food security, the following information was obtained.

Table 4.4: Effect of fish farming on protein-food security and sustainable community development

Fish productivity / Effect	Very true	True	Not true	I don’t know
Improved protein food intake & better health	41	46	65	8
Increased income from sale of produced fish	22	18	72	48
Little effect on community development	63	55	23	19
Helps protect environment for sustainability	38	54	12	56
No change as a result of fish farming	107	16	10	27

Source: Field data, 2018.

Gender-based Capacity building and empowerment for participatory fish-farming

The respondents were asked if fish farming productivity facilitated reduction of the effects of the frequent droughts and starvation, and 79 percent of the respondents said fish farming has the potential to reduce the effects of drought on food insecurity. They said when a fish farmer has a thousand pieces of fish each with one kilogram in the fish pond; this is equivalent to having a thousand kilograms of beans or any other protein food in the granary or food store. But they observed that fish farming was an expensive investment only manageable by wealthy households. This is because poor households could not afford the costs of fish fingerlings, fish feed and access to fish market which were necessary for effective fish farming.

The respondents informed that just as improved chicken rearing is an investment suitable for households with the necessary startup capital; fish farming was a meat producing activity that is not suitable for the poor households. But the poor households with the potential for fish farming posited that with effective capacity building and empowerment efforts from the community leaders and public agencies, they can be enabled to utilize the locally available water and land to do fish farming. This was an important alternative to crop farming that was hit by the negative effects of climate change characterized with frequent droughts interspersing with periods of floods. The respondents said the community leaders were supposed to be the key players in training and empowering poor farmers to be able to effectively manage fish farming. Whereas fish



farming was predominantly left for households that could afford to raise the necessary capital for farm inputs and the running costs, the poor potential fish farmers said they would be happy to benefit from fish farming as a way to fight the effects of climate change on food security.

When the respondents were asked on the roles of government agencies in training and empowering poor households to be able to management effective fish farming, the following responses were obtained.

Table 4.5: Training and empowering women and poor farmers to promote fish farming

Farmers capacity/ response	Very true	True	Not true	I don't know
Farmers are well trained on fish farming practices	16	42	75	27
Farmers receive financial support for fish farming	0	0	95	65
Effective extension services in fish farming	23	64	87	26
Farmers get subsidized inputs for fish farming	0	0	128	32
Minimal fish farming support from government	9	34	65	52

Source: Field data, 2018.

From the above table, 195 (61 percent) of the sampled 160 respondents said it was not true that farmers were well trained regarding effective fish farming practices. Another 67 (21 percent) people out of the 160 said that they did not know if farmers were well trained on fish farming practices. This makes a total of 82 percent of the respondents who did not approve of the efforts by the public government agencies to train and build the capacity of poor ignorant households to be able to manage fish farming, prepare a fish meal and be able to consume it. Training and capacity building was, however, cited as an important need because while it played a great role in promoting protein food security free from the unpredictable and unreliable rain-fed crop farming, fish farming was not popular among the poor households where it was highly needed. Fish farming was of great significance in the effort to alleviate food insecurity and promote sustainable development were to be realized.

They said there were no financial and farm inputs subsidy to farmers, and the extension services were limited to the selective households with the ability to manage fish farming.

Gender dynamics in participatory monitoring and evaluation in fish-farming

Regarding gender dynamics in participatory monitoring and evaluation in fish farming, the respondents were asked if they thought the leading stakeholders had the capacity to strengthen participatory monitoring and evaluation of fish farming, including with women and the poor

household members, where 65 percent of the respondents said the public agencies especially the department of fisheries had the necessary technical potential but limited financial ability. They said fish meat was an important source of quality protein predominantly enjoyed in the traditional fishing communities and by the wealthy people in communities where fish was not a traditional food; especially those who had travelled and exposed to fish eating. They said the allocation of necessary resources needed the goodwill support of the elected leaders. They said this was lacking because women and the poor people were not adequately enabled to have the capacity to prioritize on fish farming as an effective alternative source of protein food, nor were they afforded a forum to give their views when making major decisions like withdrawing the subsidized fish farm inputs like fish-feeds and the general monitoring of fish farming activities.

The respondents were asked if they had ways of assessing and evaluating performance of leaders involved in fish farming, and 82 percent said there was no provision for forums where women and the poor people could raise questions regarding the utilization of fish farming and the general development resources by the community leaders. A few cases were cited where wealthy members of the community had challenged the non-performing leaders in court process, but this was dismissed as too expensive luxury for the poor households.

The respondents were asked to give their responses regarding different roles played by different development agencies, including public and civil

organizations, in promoting fish farming, and the following information was obtained.

Table 4.6: Role of community leaders in promoting fish farming

Benefits/response	Very true	True	Not true	No change	I don't know
Poor farmers know how to manage fish farming	8	51	69	27	5
Poor people, especially women, have access to enough farm inputs for fish farming	0	0	144	0	16
All the people know how to cook and eat fish	42	46	67	0	5
Extension officers are available to guide and monitor on improved fish productivity	32	43	81	0	4
Fish farming initiatives are satisfactorily known by all community members	26	0	125	4	5
I do not know any efforts made to promote fish farming	65	72	12	2	9

Source: Field data, 2018.

Data from the above table shows that 68 percent of the respondents said it was not true that women and the poor farmers had the ability to effectively manage fish farming. The poor farmers in the non-fishing communities in Kisii County were ignorant of all the aspects of managing a fish farm. This includes aspects of managing fish pond in the areas of: decision making and planning; organizing the activities starting with preparing a fish pond; putting the new fingerlings; feeding routines; harvesting fish; marketing and the entire fish farming cycle; securing people to help in fish farm management chores

“I had to fill the fish pond with fertile soil and convert it into vegetable farming because when we first harvested the fish, we did not have a ready market for the produce. The fish production process was also very expensive for us, especially regarding the cost of daily fish food. The best way to feed the fish so that they would grow big as in the records was also a problem because our fish took more time to mature.”

The households in the non-traditional fishing communities who faced challenges in managing a fish farm said they would not consider fish farming in the future because fish meal was dirty and dangerous. They said there was a fish farming demonstration exercise carried out at the district headquarters, but majority of the women and the poor people did not the information about it, and some lacked fare to travel to town and attend the training sessions.

When asked if the poor people, especially women, had access to enough farm inputs for fish farming, 98 percent said this was not true (Table 4.6).

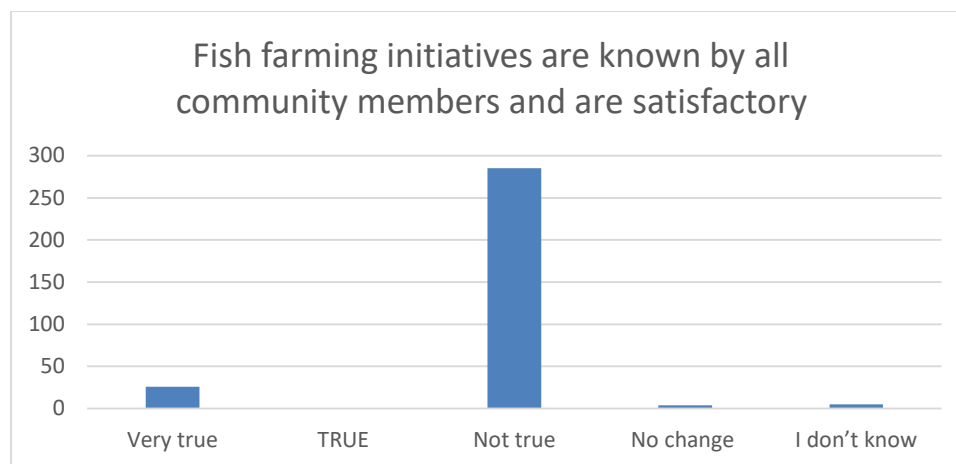
They said that women and the poor households, especially those headed by women faced numerous

especially when the farmer is not around; knowing the right things to be done in the coordinated appropriate time; budgeting and administering finances and resources used at the fish pond(s). These fish farm management aspects were found to be beyond the capability of majority of the women and the poor people with little or no formal education, and more effective capacity building training can enable them to embrace and manage fish farming. On this regard, one of the respondents gave the following qualitative data:

challenges in raising enough farm inputs for fish farming. The two items that were cited to be too expensive for the poor farmers were the fingerlings and fish feeds. The expenses attached to fish farming necessities made majority of the poor households unable to engage in fish farming.

The respondents were asked if fish farming initiatives were known by all community members, and 89 percent respondents said this was not true. Majority of the respondents said they were not informed when the subsidy on fish fingerlings and fish food was withdrawn. They said they were rarely engaged before new decisions were made. This is further presented in the following bar-graph.

Bar-graph 4.1: Knowledge of fish farming initiatives by community members



Source: Field data, 2018.

When asked to give some weaknesses or challenges associated with fish farming, the respondents cited lack of fish farming technical skills, inability of the potential fish farmers who were extremely poor to

raise the necessary farm inputs, limited extension services, and lack of participatory forums for fish farming management, monitoring and evaluation to facilitate responsible transparency and accountability.

5. Conclusion and Recommendations

The study established that there were efforts to enable the community members to participate in fish farming practice, management, public decisions and policies affecting fish farming. But this was on minimal level of top-down information dissemination, rather than bottom-up participatory method. There was room for more participatory fish farming strategies and methods, especially those enabling the vulnerable women and members of the poor households. The study findings revealed that there were efforts made to build the capacity of women and the poor people to embrace and be able to manage fish farming. Food production based on seasonal rains was unreliable due to frequent draughts, and fish farming was a reliable alternative source of protein food security. However, this depended on the ability of women and the poor community members to embrace fish farming, to acquire technical skills necessary for effective fish farm management, and their ability to have all the farm inputs necessary for fish farming. The study findings revealed that there was a strong relationship between participatory monitoring, evaluation, and accountability on the one side, and sustainability of increased fish farming productivity on the other side.

However, the poor people needed to be empowered with the necessary skills to track the performance in fish farming management, leadership, resource mobilization and utilization.

5.1 Recommendations to community leaders and development stakeholders

In light of the above conclusions made on each of the above research objectives, the following recommendations were drawn in order to facilitate improved fish farming to increase protein food security and facilitate sustainable development. The recommendations were particularly focused to the implementers, including community members, policy makers, and community development stakeholders in Kisii County: 1). There is a crucial need to develop and implement a policy guide to promote participatory fish farming, including participation of women and poor household members in decision making, management and improvement of fish farming. 2). Government and other development actors should facilitate farm input subsidies to the women and poor households to be able to embrace fish farming. 3). Due to lack of adequate technical fish farming skills, there is a significant need to improve on efforts to build the

capacity of women and the poor people by training them on how to manage fish farm and maximize productivity. 4). There is need for policy guide on participatory monitoring and evaluation of performance in fish farming, so as to promote gender equity, transparency and accountability in fish farming towards protein food security and sustainable community development.

5.2 Recommendations to the women and the poor household members in Kisii County

These are the recommendation for women and members of the poor households: 1). Women and the

poor household members should be enabled to embrace bottom-up participatory method in promoting fish farming toward improved food security and sustainable community development. 2). Women and the poor households need to be empowered with alternative sources of farm inputs for fish-farming, after government subsidies in fish-farming were abolished. 3). Women need to seek for technical fish farming skills. 4). Women and the poor households should be enabled to embrace participatory monitoring and evaluation in fish farming towards sustainable protein food security.

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