International Journal of Social and Development Concerns

ISSN 2524-1478 (Online)

Vol. 3 | Social and development concerns in Africa (b)
Vol. 3 Article 11/15 | October 2018

(An International Publisher for Academic and Scientific Resources)

GROUP NETWORKING AND THE DEVELOPMENT OF FISH FARMING IN BUSIA COUNTY, KENYA

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Abstract: *Fish farming has and continues to play a vital role in improving nutrition and creating employment. The sociological aspects manifest in the household as well as the community were the centre of focus in the study aimed at establishing the households and group networks in the development of fish farming in Busia County. It sought to assess the importance of group networking among farmers to the development of fish farming. The theory of social network action as propounded by Friedkin (1993) was used to explain the sociological relevance of the study. The study adopted a mixed methods approach and a survey research design that is cross-sectional in nature was used. The target population was that of farmers who registered were actively involved in fish farming as well as a number whom through their own initiative, ventured into the enterprise. An additional eight key informants were selected for the study. These included three government extension officers, two chairmen of fish farmers' organizations, two fish farmers in the county that belonged to groups and a chief. The findings of the study revealed that a majority of the farmers realized a growth on their fish farms. The main statistical test that was used was Chi-square goodness-of-fit. The study findings revealed that group networking was a significant component in the development of fish farming in Busia County. The study recommended that key components on conflict resolution and functionality should be included in the training, to be applied at group level. This would enhance the synergy and efficient functioning of the farmers' groups as sociological units in the optimal development of the sector. As for areas of further research, it was proposed that a study be done on the demographic variables influencing the development of fish farming in Busia County.*

Key terms*: Group networking, development, fish farming, social network theory*

1.1 Introduction

According to the International Co-operative Alliance (2011), it is approximated that one billion people take active part in cooperatives in one way or another. This is manifested either as them registering as members or as customers. They can also play a role as employees of the societies or in both (as customers and employees). Cooperatives provide employment for at least 100 million people across the world, and thus sustain the livelihoods of approximately one half the world's population being made secure by cooperative enterprise. The world's largest co-operative enterprises have collective revenues of 1.6 trillion US dollars, which are comparable to the GDP of the world's ninth largest economy in 2011 which was Spain. Professor Joseph Stiglitz of the Columbia University, recipient of the 2001 Nobel Memorial Prize in economics also builds on to the agreement in his position that a nation's trajectory in terms of economic development is interwoven in the nature of its social organization as well as in addressing structural and systemic disparities and differences. This requires not only economic changes but, also societal transformation (Stiglitz, 1998).

According to Zimba (2013), empirical evidence demonstrates that a majority of smallholder farmers who work in groups, especially into cooperative-like structures stand a higher chance of being more viable actors in the market as they enjoy the privilege of having more access to information as well as more power when it comes to matters of negotiation. This is because they approach these negotiations with the added advantage of their being in groups. They also are better positioned to be able to take optimum advantage of opportunities available in the market. This is simply by virtue of the fact that they enjoy the economies of scale and a stronger bargaining position unlike those who are acting alone in isolation.

Cooperatives and farmer-based organizations play a number of vital roles in rural communities. These include but are not limited to, promoting and encouraging democracy in decision-making processes, the nurturing and development of leadership as well as education of individuals involved in various fields. In light of the fact that they have their set values and the principles laid out in their structures, they also are strategically located to be vehicles of inclusion for categories in society that often find themselves marginalized. These are such as women and children. Cooperatives and farmer-based organizations, however, need to run or operate in similar manner as any business organization. They need to take up business models that are practical. They are also required to be dynamic and be able to acclimatize themselves and their operations to the ever-changing environment (Zimba, 2013).

In Kenya, half of the country's gross domestic product (GDP) of approximately 71 billion US dollars) is attributed to co-operatives. In Rwanda, the cooperative economy has over the last ten years, realized a growth from zero to 8 per cent of the country's GDP. In Italy, about 90 per cent of the production of parmesan cheese comes from cooperatives. In France, almost a hundred per cent of all the champagne produced in is as a result of the efforts in the cooperatives sector (Zimba, 2013).

All societies have drawn and remain to draw their existence from social groups as compared to individual persons. These groups play the key role in the determination of prevalent attitudes, beliefs, identities and values. On the same note, they play a pivotal role in the determination of vital access to resources as well as opportunities which come with their distribution and control.

This culminates to the access to power in the long run. Woolcock (2000) posits that in light of the fact that most societies are not homogeneous, there exist divisions that are dictated by class, caste, religion and ethnicity. He further posits that there could be the possibility of high social capital existent within a group ("bonding" social capital) which plays various roles of use to its members however, there could be the possibility of exclusion manifesting itself from other groups in the sense that there is the lack of bridging social capital.

1.2 Statement of the Problem

Investment in fish farming in Kenya has been seen as significantly reliant on aspects outside of the community, leaving it in the control of few at top leadership levels. This explains the immense popularization done by the governmental and non-governmental agencies alike which was the case in the Economic Stimulus Package (ESP). The approach and its accompanying strategies usually draw their impetus from evidence and feasibility studies that state a case why a venture would be the most preferred and how benefits will come forth and to who. The outcomes are therefore accrued to positive and sometimes negative interventions of relevant state and non-state agencies.

Credit is often then availed to these agricultural-based organizations (both government and non-government) leaving the farmers' groups with lesser stake to claim. Equally, the farmer is seen as a passive player who once trained on certain technologies and financed, is expected to succeed. This study therefore sought to situate group networks in the development of fish farming in Busia County. The findings are of importance to show that these perspectives are relevant in the optimal adoption of the technologies because of accommodative sociological foundations.

1.3 Theoretical Framework

Social Network Theory

The pioneers of the thinking around social networks in the late 1800s were Émile Durkheim and Ferdinand Tönnies. This theory focusses on studying the manner in which people, organizations or groups interact with others within their networks. The theory is best understood when examined from the individual sections which begin with the largest element of all i.e. networks, and zeroes in to the smallest ones which is the actors.

Within the framework of research, the key aspect that stands out is cohesion which is a key feature in the moderation of the guidance of social networks. According to Friedkin (1993), personal influence tend to strengthen within social networks that are more cohesive as opposed to those that are less cohesive. Finally, structural equivalence point to the existence of potentially multiple positions within the network that share a pattern of connections that is similar with those manifest in the network. Actors within the network that tend to have positions that are of similar structural equivalence in many instances have similarities in their characteristics. These include social status among other individual traits. In light of the fact that correspondent nodes have a connection to actors that are that are similar in nature, there is the probability of them being recipients of similar sets of information or being significantly influenced by the ambient social set ups.

The theory is applicable to the study in light of the fact that it shows how networks affect the individual actors and thus sufficiently serves to anchor the relationship between that variables of

the study. This specifically is the manner in which individual farmers work in social set ups which are the families and the groups which they belong to. Similarly, just as much as they influence the actions of those in the families and groups, they too get influenced through the sharing of norms and value systems revolving around the various aspects of fish farming.

1.4 Literature Review

Shrestha, Pant and Bhujel (2012) argue that that formation of fish farmers' groups is important as is serves the role of creating an ambience that would foster collaboration between them and the relevant government establishments. It is through this that they get the chance to raise their demands in light of what they need. Studies on information acquisition in agriculture in the past portray the farmers as simply information consumers. This is in tandem with the school of thought that they are at liberty to choose information sources that will enhance the projected importance for which it was being sort for (Dyer & Nobeoka, 2002; Wozniak 1993, Feder & Slade, 1984). Earlier models used in the analysis of determinants of information acquisition were seen to heavily favour the idea of formal sources of information (i.e. specialized information providers such as extension educators, radios or publications). Information from other farmers was understood to be accessible to all farmers (Feder & Slade 1984). This proposition leaves a lot to be desired as Conley and Udry (2001), challenge its stance. Information on agricultural innovations circulates via social networks unlike being freely presented to the farmers.

Information from other farmers is disseminated through pooling and copying systems (Collier, 1998). Pooling of information is a mutual undertaking where the entity in direct interpersonal interactions gives some information and/or obtains some from others in return. Copying has information flowing in one way and this takes place by physical observation of the others' experiments leaving out the possibility of direct interaction between parties. While the conventional channels transfer information from providers to the consumers in a unidirectional way, information transfer via informal channels is multidirectional. Parties concurrently obtain and offer information to each other. In simple terms, there is an elaborate exchange information.

According to Fafchamps and Minten (2001); Collier (1998); Conley & Udry (2001) in Katungi (2006) knowledge about recent technologies and markets have been found to disseminate via social networks of friends, relatives and associates. For there to be any gainful information exchange amongst individuals, there has got to be substantial interpersonal connections in place (Coleman, 1988; Granovetter, 1973). The role of social networking comes in as its accumulation in the previous period facilitates the flow of resources between agents in an economy (Putnam, 1993). The assumption is that each player participates in information exchange with a fixed (predetermined) level of social capital and examine how endowments of social capital influence information exchange, paying close attention to gender differences (Katungi, 2006). A rise in earnings for the farmer, access to credit and the pooling of effort can help farmers to improve their farms. It is much more feasible for government and development agencies to organize training and agricultural extension services for groups of farmers rather than for individuals themselves. Even if all farmers find it difficult to attend training sessions, individuals from the group can pass on advice and training to their fellow group members (Robbins, Bikande, Ferris, Kleih, Okoboi, & Wandschneider, 2005).

In a study on agricultural commodity traders in Madagascar, Fafchamps and Minten (1999) pointed out that social networking made it possible for traders to cut down business expenditure which was brought about by incorrect information. This boosted profit margins substantially. On the other hand, an insight into membership, the numbers of groups and associations, the rate of joining group activities, the level of participation in groups and the partisanship diversity are comprehensively utilized. In general, network and membership have positive outcomes on the community members' welfare and by extension, community development.

According to Wanyama (2016), as savings and credit cooperatives (SACCOs) serve the key role of facilitating access to financial capital for their members, agricultural cooperatives play the role of enhancing the farmers' access to inputs that are necessary to grow their crops and rear livestock as well as support them in the processing, transportation and marketing of their produce. Similarly, the consumer cooperatives play the role of facilitating their members' and the societies' access to household supplies that are of high quality such as food, clothing, and other products at reasonable prices. Such assist in pulling members out of the poverty trap.

In Uganda, Walimi Fish Farmers' Cooperative Society (WAFICOS) registered under the Uganda Co-operative Alliance (UCA) was set up with the vision of making fish farming a worthwhile venture in terms of profitability and giving it a competitive edge. The organization has a variety of benefits to offer the members. These range from producers of fingerlings to breeders, trainers, fish feed manufacturers, processors, input suppliers and researchers. In addition to these, the members have at their disposal, access to vital services which include expert advice, supply of various inputs, equipment for hire for various farm practices such as pond construction, fish harvesting and transport. They also engage in marketing farmers goods collectively, provide pertinent information on the latest on-goings and technological innovations, and value addition of farmed fish products (Walakira & Atukunda, 2011). From the perspective of collective action, according to Vanni (2014), it is noteworthy for scholars interested in the field of community dynamics and more so collective action as a pertinent issue to appreciate the nature of organization in terms of how it has advanced and/or buttressed such action. In a myriad of cases, the results and outcomes of the engagement in collective action are in a major way not only reliant on the type of organizations involved, but equally to the formal provisions which have been put in place at the grass root level. In the realm of agriculture, for example, it is indeed essential to draw a distinction between the development of collective action and association that is directly controlled by farmers or one that sees its control and support spearheaded by a national/regional governmental authority. Many previous studies conclude that collective action is more prevalent in successfully developed communities. For instance, Krishna & Uphoff (1999) found that social capital was highly correlated with village-level performances of mutually beneficial collective action and common land development in India.

Group networking and technology dissemination has also been observed by Njuki, Mapila, Zingore and Delve (2008) that gendered group networking was found to play a pivotal role in bettering the uptake and utilization of technologies that are especially useful for livelihood outcomes. Extension and community development programs, therefore, must be all-inclusive in their membership, thus incorporate gender within extension and other programs aimed at increasing the up-scaling of more efficient adoption of technologies. It is obligatory that they

need to prop up technologies that are of assistance to women in terms of bettering their earnings or reducing their labour input. Such ventures empower them in terms of capacity to self-expression which in turn will better household gender relations. A rise in earnings for the farmer, access to credit and the pooling of effort can help farmers to improve their farms. It is much more feasible for government and development agencies to organise training and agricultural extension services for groups of farmers rather than for individuals engaging the same farm activity. Even if all farmers find it difficult to attend training sessions, individuals from the group can pass on advice and training to their fellow group members (Robbins, Bikande, Ferris, Kleih, Okoboi & Wandschneider, 2013).

Collective marketing plays a major role in farming throughout the world. In most countries farmers have found that they can increase their income and efficiency by joining with other farmers to market their goods, purchase their inputs and co-ordinate their farming techniques. According to SARD (2007), farmers' organizations can help farmers gain skills, access inputs, form enterprises, process and market their products more effectively to generate higher incomes. By organizing themselves into these groups, farmers can access information needed to produce, add value, market their commodities and develop effective linkages with input agencies such as financial service providers, as well as output markets. Farmers' organizations can achieve economies of scale, thereby lowering costs and facilitating the processing and marketing of agricultural commodities for individual farmers. Marketing-oriented FOs can assist their members purchase inputs, equipment, meet quality standards and manage the drying, storage, grading, cleaning, processing, packing, branding, collection and transportation of the produce of their members. In this way FOs provide a more reliable supply to buyers and sell larger quantities at higher prices. Organized farmers have greater bargaining power than individuals and are better able to negotiate with other more powerful market players to ultimately increase the profits that accrue to farmers rather than intermediaries and buyers.

In looking at improving economies of scale, Katungi (2006) in a study on maize farmers in Uganda posited that small-scale farmers need to better their economies of scale. It is necessary to have farmers' groups which will put together their produce and market it collectively. This will allow them sell their goods at the higher bulk price which is only possible if farmers sort and grade their produce into one or a few batches which are of similar quality. This will be more easily accomplished if farmers agree to plant the same variety of crop, to sow it at the same time and to adopt the same growing, harvesting and post-harvest techniques. The most successful strategies for collective marketing include co-operation with the task of selling the goods and a high degree of collective activity right through the farming process. Improving economies of scale implies a division of labour to make the whole operation more efficient. If a group of farmers decide to adopt this strategy, a small group of trusted individuals belonging to the group need to take the responsibility for selling the goods, keeping accurate records, dividing the proceeds among the individual members of the group and organising production and collection (Robbins, P., Bikande, F., Ferris, S., Kleih, U., Okoboi, G., & Wandschneider, T. (2005).

Omasaki, Charo-Karisa and Kosgey (2013) argue that in Western Kenya, most farmers sold their fish raw at local and nearest urban markets, with the prices varying with the weights of the fish. Fish were harvested and sold throughout the year. This presumably led to low prices because of lack of storage facilities for most farmers. Farmers tended to sell with an aim to finish the day's

harvested stock. Most traders took the advantage of the situation and exploited the farmers by buying the fish stock at low prices. Farmers would, therefore, not likely adopt improved management practices while proceeds from sale of fish are low (MoLFD 2007). Current marketing information is largely informal and obtained by talking to buyers/ traders or sellers who have conducted transactions. The fact that most consumers were paying premium prices for fish species reared could influence the species adopted by farmers (Henryon et al 1998). To tackle the problem of marketing, cooling facilities are essential and farmers should have a collective approach on the matter.

Bulking up small parcels of produce into truck-loads of goods offers farmers the possibility of selling their goods outside their immediate location. If farmers have access to very few traders and they do not know the true, market price, they are at a disadvantage. In some countries traders will sometimes collaborate with each other to offer the same low price to local farmers. If farmers have a large stock of goods to sell they can hire transport for themselves and they can travel to more distant markets to find traders who pay better prices than those available at their locale. If farmers are able to cut out the middle man, the farmer and the consumer will benefit because it will lower transaction costs. This is because of increased economies of scale. If traders have lower costs, they can pay more to farmers and sell at a lower cost to consumers (Markelova, H., Meinzen-Dick, R., Hellin, J., & Dohrn, S. (2009).

In terms of improving access to credit, Katungi (2006) puts forth a strong case for the importance of collective activity as having the ability to enhance the chances of farmers accessing credit facilities. They may be able to borrow money to buy inputs and improve their farm which, in turn, can translate to increased incomes. Individual farmers are usually subjected to high interest rates whenever they access credit facilities from individual traders. If farmers could access credit from established financial institutions, the rate of interest may be relatively lower. However, banks will not lend money unless the farmer is in a position to provide collateral. Most African farmers have very few assets which disqualifies them for credit. Banks are much more likely to lend money to groups of farmers. The total assets of a farmers group may be enough to cover the loan and a binding agreement between the bank and a group of farmers is seen as a satisfactory assurance that any loans will be repaid. Encouraging banks to make this kind of loan can be assisted if the farmers' group can make savings of their own in a secure credit union or savings scheme. Several aid agencies now assist farmers in need of credit by offering matching loans and administrative support and training but, again, they are usually only interested in offering this help to properly constituted groups of borrowers.

Often FOs aim to provide financial services to their members such as credit, loans, insurance and savings. Any development assistance or government project extending financial services to the rural poor must first be informed by an analysis and understanding of the local formal and informal lending institutions that have been established by the poor themselves. These organizations have an expert knowledge of seasonal cash needs and are based on trust and reciprocity, often using reputation as a form of collateral and achieving good repayment rates and low default numbers. FOs can link with local financial service providers and thereby reduce their operational burden of maintaining loan and repayment records and managing risks of the loan portfolio. New financial services must not affect or undermine the functioning of local

financial organizations but instead must work with and improve them to extend their reach (SARD, 2007).

In assessing the role of group networking and education of farmers, it has been observed, In Nigeria, the interaction between the extension agent and the aquaculture farmers are poor due to level of education of most farmers (Adedeji & Owoigbe, 2005 as cited in Adedeji and Okocha (2011). On the contrary, Weir and Knight (2000) in a study conducted in Ethiopia revealed that educated farmers tend to be early innovators in a particular area. However, once an innovation has been tried and the results are obvious to others in the site, a farmer need not himself be educated in order to appreciate the possible advantages of new inputs or farming techniques. Social learning may occur. If uneducated farmers learn from the experiences of the educated ones, then part of the effect of schooling includes the external benefits following from the increased opportunities for social learning in the site. Education in this case can be said to encourage initial adoption of innovations and that less educated households copy the more educated ones in a process of social learning.

This research paper seeks to present the case of Busia County in subjecting the hypothesis that there is no relationship between group networking among fish farmers and the development of fish farming in Busia County.

1.5 Methodology

This study used a mixed methods approach particularly a cross-sectional design. This choice of approach was best because it possesses the attributes of giving the study insight that encapsulates both the aspects of depth/intensiveness and breadth/extensiveness. This is through the use of the survey that is cross-sectional in nature (cutting across Busia County) as well as interviews (targeting key informants). The research therefore sought to deploy the same principle based on the utility of the design. For the study site, the research was conducted in Busia County. The choice of the site was informed by the reports on the vibrant fish farming activity taking place in the County. This was equally informed by the County having benefited from the ESP. The registered fish farmers who benefitted from the ESP and were still working with the fisheries department were about 1, 620. As at 2015, 55 per cent (800) were active. (County Government of Busia-Fisheries Office, 2015). The farmers who were chosen for the study were selected using random sampling which allowed an equal chance to all and enable the study respondents get an equal chance of being selected. For the purpose of this study, a sample from the total number of households was chosen from farmers' groups. This was arrived at by the use of the equation 1 below (Yamane, 1967).

Equation 1: Yamane formula to determine sample size

$$n = \frac{N}{1+N(e)^2}$$

Where; ***n*** is the sample, **N** is the universe/population and ***e*** is the confidence level

$$n = \frac{800}{1+800(0.05)^2}$$

This gave a total of 267 respondents to be interviewed. However those that the research team was able to access randomly during the study who were beneficiaries of the ESP was 222. An extra 31 who went into fish farming upon funding themselves were also selected through random sampling. An additional eight key informants were selected for the study. These included three government extension officers, two chairmen of fish farmers' organizations, two fish farmers in the county that belonged to groups and a chief.

The study used two research instruments. These were the standardized interview schedules for the survey to collect information from the farmers, and interview guides for key informants. These key informants were chair persons of the farmers' groups, a chief and county fisheries officers.

Data Analysis Interpretation

A Chi-Square goodness-of-fit test was performed to find out whether there was a relationship between group networking and the development of fish farming in Busia County. There was a significant relationship between group networking and the development of fish farming.

$$\chi^2 (2, N=178) = .006, p <.05)$$

This therefore tells us that group networking among farmers had a relationship with the development of fish farming in Busia County. This is presented in table 4.16 below.

Table One: Chi-Square test for the relationship between group networking and the development of fish farming

	Development of Fish Farming			**Total**
Is Group Networking Important to Development of Fish Farming?	**Decrease**	**No Change**	**Increase**	
No, it is not	10	5	40	55
	18.2	9.1	72.7	100.0
	45.5	**11.9**	**35.1**	**30.9**
	5.6	2.8	22.5	30.9
Yes, it is	12	37	74	123
	9.8	30.1	60.2	100.0
	54.5	**88.1**	**64.9**	**69.1**
	6.7	20.8	41.6	69.1
Total	22	42	114	178
	12.4	23.6	64.0	100.0
	100.0	**100.0**	**100.0**	**100.0**
	12.4	23.6	64.0	100.0

$$\chi^2 (2, N=178) = .006, p <.05)$$

The above test was performed by comparing findings from the field. The first variable was how the farmers rated the importance of networking to development of the fish farming enterprise. The second variable was the development trends as derived from comparing farmers records on the weight in kilogrammes of fish harvested. Based on the results of the test, the study therefore rejected the null hypothesis that there was no relationship between group networking and the development of fish farming.

The therefore, findings did support the notion that there was a relationship between group networking among farmers and the development of fish farming in Busia County. This showed that those who were in groups had a clear advantage over those who were not in any when it came to the development of their fish farms. This suggests that the success or failure of fish

farming can also be attributed to networking. There are five possible explanations that could be given to shed light on the above-mentioned scenario. The first possible explanation to the relationship between group networking and the development of fish farming for this scenario was that the farmers who were in groups had a number of them who mentioned, during interviews, that they were in a position to access credit facilities and financial grants which enabled them expand their fish farm investments. This is shown in the verbatim quote below.

> *.....through groups, a group has power to look for funds from financial institutions as opposed to an individual. Through groups, farmers can get loans easily than individually.*
>
> ***Source: Interviewee Five***

The reports that were given by respondent farmers as well as the key informants indicated that these benefits went a long way in driving the development of fish farming on individual as well as cluster-owned farms. Such privileges were not at easily accessible to those who were not members of groups. This trend is in agreement with the rational choice theory (Friedman and Hetcher, 1990) in light of the fact that individuals make decisions after having thought out the possible outcomes. This means that the farmers seek to maximize gain by joining groups as well as investing in membership of groups which results to access to financial support that they get to invest in their fish farms. The findings are also in agreement with those of Katungi (2006) who posits that collective activity has the ability to enhance the chances of farmers accessing credit facilities. This is supported by the quotes from interviews with key informants. Various verbatim quotes in support of the findings from the key informants who took part in the study are presented below.

> *Cooperatives are also able to source for funds from banks to loan to their members, from the county governments, to loan to their members. The one we have from Samia has good funding already and last year (2014), they got around kshs 2million to put up their offices and start working. There is also another program being run from that side by Western Kenya Community Driven Initiative which has also done some good funding to the cooperative. Anyone who wants to fund farmers finds it easy to do it through the cooperative than through an individual.*
>
> ***Source: Interviewee Four***

The second possible explanation that explained the relationship between group networking and the growth of fish farming was the access to farm inputs at a cheaper cost as compared to when they would source for them individually. There were two alternatives to this. One was the capacity for farmers through the groups to purchase farm inputs in bulk and thus gain from the discounted prices. These included but were not limited to fish feeds, fingerlings, lime and nets. Also, it was observed that some farmers' groups actually had the capacity to produce their own inputs especially fish feeds. These two alternatives were seen to have a positive influence on profit margins as farmers ended up spending less on inputs. The findings are in agreement with the social network theory by Friedkin (1993) where farmers are seen to abide by the proposition that working as a group would allow them increase their profit margins through cheaper inputs accessed as above-stated. This is supported by the quote from an interview with a key informant.

> *…….in buying feeds and raw material, there is purchasing power since the group can buy in lump sum hence getting a good discount.*
>
> ***Source: Interviewee Six***

The third possible explanation for the relationship between group networking and the

development of fish farming was the aspect of groups being able to provide better security for their pond sites as compared to the farmers who worked as individuals. In groups, they could guard the ponds against attacks by predators and thieves. This was organized in such a manner that farmers either took turns through the guidance of a duty roster or collectively contributed towards the procurement of security services. These two approaches gave a higher assurance of the reduced losses as compared to the farmers who worked alone, sometimes relying on family members who sometimes let them down. This is supported by the quote from an interview with a key informant.

> *We also have clusters where we look at the production and see that fish is doing well, we employ someone to manage the security of the ponds especially if the ponds are near each other or grouped together then the owners of the ponds can agree on how to employ someone for security for about 3 – 4 months when fish have become big and are a temptation. This person provides security at night while we are there during the day.*
>
> ***Source: Interviewee Three***

The above-mentioned position is in agreement with the social network theory by Friedkin (1993) which propounds that behavioural intention was also determined by the actions and wellbeing of the larger group and thus, the individual's motivation to comply with the norms. The farmers feel compelled to contribute towards the pond security as it was expected of them to do so as part of the group norms. It also further agrees with the rational choice theory (Homans, 1961; Friedman & Hetcher, 1990) in light to the hypothesis that social structures, collective decisions, and collective behaviour resulted from rational choices made by individuals who sought to maximize on the utility or value of a decision. The farmer's rationalizing that there is need to pool together in order to provide security for their ponds served as an important testimony to the above. The fourth possible explanation for the relationship between group networking and the development of fish farming was the access to trainings on fish farming. The respondents as well as the key informants mentioned that the farmers' groups served as access points for farmers to receive vital training on various issues that were pertinent to the development of their fish farms. These trainings offered technical know-how in areas such as pond preparation, liming, feeding, and post-harvest handling among others. The aspect of mobilization, training and follow-up was taken care of easily since the relevant stakeholders (governmental and non-governmental) would come through the groups. This was unlike dealing with individual farmers who posed a challenge in the three areas.

The same group members had the privilege of visiting other groups and their farms from which they could learn and get to exchange ideas. The findings of this study are in agreement with the rational choice theory (Friedman & Hetcher, 1990) which posits that the individuals weigh the benefits of all available options and settle for the one that they would consider as the best. It is on this basis that farmers appreciate the need to join groups and benefit from the trainings that they got, organized mainly by government agencies, which translated to development of their fish farms. The findings are in tandem with what Shrestha, Pant and Bhujel (2012) posit about the formation of fish farmers' groups. They see it as being of importance in the creation of an ambience that would foster collaboration between them and the relevant government establishments.

This is supported by one of the key informants who took part in the study and contributed to this

subject as presented below.

> *There is also networking for example, Butula group may have their leaders and through them new vital information can be made. Since these farmers are registered, they can be reached for example in trainings. They visit other groups and learn from their challenges and successes hence leading to improvement in their fish farming procedures.*
>
> ***Source: Interviewee Two***

The sixth possible explanation for the relationship between group networking and the growth of fish farming was the access to markets. The farmers who were in groups were able to access better markets through the following ways. First, the sharing of information that circulated through the farmers' networks allowed them to share with their members on the availability of market in various parts of the county and beyond. Secondly, they also allowed the farmers to sell their fish farm produce collectively which meant that the group (especially the cooperatives) took up the responsibility of storage, transportation and transaction on behalf of the individual farmers in the group. This position is in agreement with the one taken by Woolcock (2000) who posits that cross-cutting linkages that exist between groups play a key role in opening up and enhancing the access to economic opportunities to all, including those who belong to less powerful or excluded communities and groupings. They also work towards the building and strengthening of social cohesion, which is known to serve as a critical component in societal stability and economic welfare over various periods, brief or extended. In further support of this position are the writings by Foster, Meinhard and Berger (2003) whom according to them, economic development does take place the moment individuals begin to shift or move from bonding organizations that help individuals "get by" in terms of assisting them in leveraging community assets to bridging organizations that assist individuals in the acquisition of valuable skills and resources that will serve to assist them get to overcoming community limitations and "get ahead".

A verbatim quote from a key informant who took part in the study is presented below.

> *It is cheaper for us to approach them through a cooperative since the cooperative commands a large area and has a network to bring farmers together so we do the trading for them……Groups have high bargaining power in selling products, harvesting is done as a group and market is gotten as a group. In announcing, a larger area is captured hence more market.*
>
> ***Source: Interviewee Six***

These findings agree with the arguments of Collier (1998) who sees farmers as information consumers which they access through groups. This occurs during the sessions when they share. They also agree with the study by Katungi (2006) in his study on maize farmers in Uganda whereby he looks at each player as participating in information exchange with a fixed (predetermined) level of social capital and examines how these endowments of social capital influence information exchange, paying close attention to gender differences. Equally, Putnam (1993) gives a position that agrees with the findings of the study whereby the role of social networking comes in as its accumulation in the previous period, which then serves to facilitate the flow of resources between agents in an economy. The findings presented above have sociological implications as they are demonstrate the presence of functioning groups and by extension, the networks within. In specific terms, the networks within the groups are as a result

of the clustering of farmers. The repercussive effect of this is that farmers get to access content/information that is important to the development of fish farming. They also get to access vital trainings organized by governmental and non-governmental organizations. They get to network beyond their own groups through the organization of field visits to other farmers' groups which gives leeway for broader knowledge sharing. The farmers manifestation of the networks allow farmers access to credit facilities from the group kitty and/or from external financers such as those in and outside government (county and national).

1.6 Conclusion

From the findings, group networking is a significant component in the development of fish farming in Busia County. This is because the farmers relied heavily on them for a very wide range of services such as marketing, trainings, feed formulation, storage, and access to credit facilities among many more. It could therefore be concluded that there was a significant relationship between the group networking and the development of the sector in Busia County. The aspect of relationship was also seen to be unaffected by the control variables of age and gender.

The findings presented above have sociological implications as they are demonstrate the presence of functioning groups and by extension, the networks within. The networks within the groups are as a result of the clustering of farmers resulting to farmers getting to access content/information that is important to the development of fish farming. They also get to access vital trainings organized by governmental and non-governmental organizations. They get to network beyond their own groups through the organization of field visits to other farmers' groups which gives leeway for broader knowledge sharing. The farmers manifestation of the networks allow farmers access to credit facilities from the group kitty and/or from external financers such as those in and outside government (county and national).

1.7 Recommendations

The farmers' groups should engage in a recruitment of fish farmers who are not in groups. The farmers' groups should work towards encouraging locals who have the capacity to do fish farming to engage in it and, empowering those with the will with financial and technical assistance for start-up. The end goal in sight would be to increase networks that will ensure awareness creation on proper farm practices for optimal output. This by extension will enhance the development of fish farming in the region.

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