

Family Support and the Development of Fish Farming in Busia County

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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 family support to the development of fish farming. The rational choice theory as propounded by George Homans (1961) was used to explain the sociological relevance of the study. The survey research design that is cross-sectional in nature was used. The target population was that of farmers who were actively involved in fish farming as well as a number who through their own initiative, ventured into the enterprise. Eight key informants were selected for the study. This study used a mixed-methods approach. The main statistical test that was used was Chi-square goodness-of-fit. The findings of the study revealed that a majority of the farmers realized a growth on their fish farms. The study findings also revealed that family support 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 family level. This would enhance the synergy and efficient functioning of the families as sociological units in the optimal development of the sector.*

Keywords: Family support, household, fish farming, rational choice, conflict, training

1. Introduction

Family support is by far the most important production factor for agriculture in developing countries, and maintenance and enhancement of labour productivity is central to securing and increasing income (Zeller & Sharma, 1998). Many of the world's poorest people depend on family farming for their livelihood. Family farms account for almost 90 percent of the world's farms (Gibbon and Gulliver, 2001). Sociologists have laid emphasis that the nature of interaction that exists between family and the farm translates to the fact that a family farm can be looked at in the light of being more than a specialised career; it manifests itself in form of lifestyle and way of life of the individuals involved (Calus, 2009).

Fish farming is expected to increase the marginal productivity of agricultural labour and hence increase earnings for both own-family and hired labour. According to Takane (2008), labour is a key asset for

smallholder households in rural Malawi. The quality and quantity of labour available to the household in terms of numbers, educational level, skills, and health constitute the human capital that become the basis for constructing household livelihood strategies. In the context of Malawi's smallholder production where farm mechanization is virtually non-existent and all farm work is done manually, having access to necessary labour for agricultural production directly affects the levels of household farm income. In addition to working on a household's own farm, labour may also be deployed in off-farm economic activities, thus providing additional income to the household. This is a critical point of focus in understanding the growth and development of fish farming in a rural setup.

The small-scale fisheries sector are normally disposed to being firmly based in local communities, traditions and value systems. A significant number of these fishers are self-employed and ordinarily provide fish

for consumption for the members of their households and communities alike. Small-scale fisheries contribute about half of global fish catches. When considering catches destined for direct human consumption, the share contributed by the small-scale fisheries increases to two-thirds (FAO, 2018).

Information that contributes towards understanding the role of the households and networks in the development of fish farming in Busia County is not available. The information on the development of fish farming reliant on the individual views, of community members, roles played by household members, the benefits to the household and the importance of group networks have not been given much focus in terms of research and documentation. This study sought to contribute towards filling this knowledge gap.

From the practise on the ground, the sociological aspects of fish farming have been focussed on the socio-economic benefits they have to society from the top-down perspective. The current study contextualizes the sociological aspects involved in fish farming that are pivotal in anchoring and further developing the practise. This is from the family as well as the community level/group dynamics. The research focusses on the two areas which are critical to the development of fish farming in the region for the various entities - governmental and non-governmental alike - to roll out such initiatives. The objective of this paper was to establish the importance of family support in the development of fish farming in Busia County.

The development of fish farming necessitates a sociological analysis as in many instances, it has been observed to be a preserve of the financially endowed governmental and non-governmental organizations. This study serves to properly situate the role of family support from the sociological lens as well as enlighten the understanding of the need to have a concerted and multi-pronged effort in the push towards development of fish farming in Busia County.

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 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. The objective of the study was to investigate the importance of family support in the development of fish farming in Busia County.

2. Review of Related Literature and Studies

This section covers the theoretical framework of this study as well as the review of related literature and studies:

2.1 Theoretical Framework: Rational Choice Theory

The key proponent of the theory in sociology was George Homans (1961), who set out a basic framework of the exchange theory, which he grounded in assumptions drawn from behaviourist psychology. Milton Friedman further contributed to the development of the theory (Friedman & Hetcher, 1990). The theory states that human beings made decisions that are purpose and goals oriented. They were therefore systematic in their ordering of priorities and needs. Human beings would therefore make informed calculations after having compared them to the variety of alternatives at their disposal. This was made possible through constant reflection of the priorities, the cost implications of each alternative in terms of values foregone and the best way to cash in on the worth of the initiative. Rational choice theorists also are appreciative of the fact that the possibility of sanctions either in form of punishment or the promise of a reward may have the effect of motivating people just as much as the punishment or reward itself. This theory is relevant to the study as it relates to the dynamics in the ideal family setup that is set to support the development of fish farming. When family members all appreciate the benefits that may come forth from the initiative, then they are

likely to rationalize the need to fully participate/support it. They would therefore order their priorities to accommodate the necessary inputs towards the growth and development of the enterprise within the household setup.

2.2 Literature Review

The aspect of family support in fish farming can be understood from the social capital perspective. The three types of social capital can be defined as follows; bonding social capital focussing on the relationships that persons have with their friends and family, making it also the strongest form of capital. It can also be seen as homogeneous in nature as it looks at the aspect of commonalities and similarities between those who find themselves in it (Putnam 1995, 2001; Coleman, 1988). Bonding social capital is also looked at as informal in light of the fact that the individuals therein are not bound by laid down/ documented policies and principles, unlike the case in formal groupings. The two other types of social capital are bridging and linking.

Edwards, Franklin and Holland (2003) observe that James Coleman and Pierre Bourdieu are two social capital theorists who represent approaches that situate families in their conceptions of social capital. They lend themselves heavily to philosophies that focus on the ties that exist between individuals and small groups, notably families, and wider social organisations and institutions. The writings and thinking of Coleman however vary from that of Bourdieu as the latter is more concerned with class-based power conflicts. The most detailed treatment of the dynamics of family life and processes of social capital is contained in Coleman's body of work (including 1988a, 1990; 1991, 1997[1988]). Coleman's efforts are geared towards making an attempt at combining economic rationality and social organisation theories. In this, it is evident that there is considerable emphasis and focus on both aspects of action and structure. In his later work (1991), Coleman also comes across as laying emphasis on initial underpinning and basis of biological rationality (primordial/initial relations that were established by childbirth).

Many of the world's poorest people depend on family farming for their livelihood. Family farms account for almost 90 percent of the world's farms (Dixon, Gibbon and Gulliver (2001). Farm labour force in the European Union (EU) is quite tricky to be described because agriculture is still dominated by family farms, where family members provide labour input at

different times of the year, not always in a regular manner. Family members contributing to farm work don't always receive a salary but rather participate in the profit made by the holding. Many farmers and farm workers pursue agriculture as a part-time activity with the practice being characterized by seasonal labour peaks, where large numbers of workers may be hired for a relatively short period of time (European Union, 2017). Finegold (2009) also agrees with the position taken by these scholars in positing that the vast majority of African fish farming is carried out at a very small scale. Over 90 percent of African fish farming production takes place in farms that have one or a few earthen ponds. The ponds are constructed and managed through the use of family labour.

The adoption employment linkages to food security are based on the hypothesis that the consumption and nutrition status of household members is related to the household's ability to earn income, which in turn depends on the nutritional health of the household labour force. Family labour is by far the most important production factor in developing county agriculture, and maintenance and enhancement of labour productivity is central to securing and increasing income (Zeller & Sharma, 1998). Fish farming is expected to increase the marginal productivity of agricultural labour and hence engender higher earnings for both own-family and hired labour. Collier & Dercon (2014) define the farmers who rely on family labour as smallholder family farmers. "These are people working in any area of agriculture who derive a significant portion of their income from farming, involve members of the family in managing the farm and rely predominantly on family labour".

In Nepal, the incorporation of women into their fish farming development plan is absolutely essential to the development of fish farming. Women have an important role in local communities and in the household to help curtail protein and dietary deficiencies as well as increase their role for social equality and recognition. In addition, women play a central role in production through their engagement in subsistent agriculture and livestock rearing as well as raising the children while men, due to limited employment and income, seek out jobs in urban settings to generate an income for the family (Bhujel, Shrestha, Pant and Buranrom 2008 in Kloeblen, 2011). This leaves women in charge of management and development of family owned fish farms and resources.

The same situation is manifest in Nigeria in terms of women input, a major role in fish farming production around the world sees them engage as labourers and managers of the production process. The roles of women in fish farming production are recognized in three ways or stages of production: fishing, processing and marketing. However, one of the major problems is the socio-cultural taboos against women who strive to earn their living in rural areas and this given has resulted to gender bias in fish farming activities (Olufayo, 2012).

In as much as women in Nigeria take part in fish farming, the story is different with the level of their engagement/participation. Adewuyi, Phillip, Ayinde, and Akerele (2010) argue that women have not featured so strongly in the enterprise. Evidence from a research study they carried out gave a descriptive analysis of socio-economic characteristics of respondents showing that male fish farmers constituted about 87.7 per cent. This was against the female farmers who constituted 12.3 per cent of the respondents who took part in the study.

According to Takane (2008), labour is a key asset for smallholder households in rural Malawi. The quality and quantity of labour available to the household in terms of numbers, educational level, skills, and health constitute the human capital that becomes the basis for constructing household livelihood strategies. In the context of Malawi's smallholder production where farm mechanization is virtually non-existent and all farm work is done manually, having access to necessary labour for agricultural production directly affects the levels of household farm income. In addition to working on a household's own farm, labour may also be deployed in off-farm economic activities, thus providing additional income to the household.

According to a study done by Omasaki, Charo-Karisa and Kosgey (2013) on fish production practices of smallholder farmers in three counties in Western Kenya, most important source of labour was the family, with a lesser percentage being hired. The combination of family and hired labour was also commonly used. The major tasks they engaged in were general cleaning and management of the fish ponds, predator management and harvesting of the fish. Table 1 below shows the findings of the study.

Table 1: Source of labour for fish farmers across the three counties surveyed

Labour	Frequency (n)	Percentage
Family	60.0	58.9
Family and hired	32.0	31.3
Hired	10.0	9.80
Total	102	100

2.3 Challenges in Family Support

El-Naggar, Nasr-Alla, and Kareem (2006) carried out a study seeking to examine the economic analysis of fish farming in Behera Governorate of Egypt. Their findings revealed that most farmers were married and thus, the implications of this was that this figure was expected to see an augmentation and enhancement of the use of family labour in the operations on the fish farms thus resulting to a reduction in the reliance and use of hired labour among the respondents in the area of study. It also revealed that most farm managers (who were in most cases the heads of the homes) had no specialized training in fishery management. El-Naggar, Nasr-Alla, and Kareem were therefore, strongly convinced that the percentage of those who lacked the training was bound to translate to impending disaster in the sustainability of fish farming in Behera Governorate.

The aspect of the consumption of fish by the households also posed a challenge to the development of the sector in Malawi. Andrew et al (2003) found that engagement in fish farming was strongly driven mainly by needs in terms of household consumption as well as to augment household income. It was not surprising however that the livelihood outcomes tended to vary considerably. This was dependent on the quantity of fish produced.

In as much as the quantification of the outcomes was rather hard to attain in light of the fish farmers' practice of seldom keeping farm records (in addition to a myriad of issues posed by responses that are considered strategic as well as defective recollection), the general patterns of livelihood were rather reliable all through the study. Andrew et al (2003) gave a description of the more effective and functional fish farming group as follows:

Those fish farmers who realized high production yields on their farms also tended to realize the same in the other investments on their farms. The same fish farmers also tended to be more advanced in age and were also seen to have large families which translated to the availability of adult labour as well as there

being more dependents. The same households had higher levels of education which often translated to more skilled employment experience. They were also seen to enjoy a greater/better access to land, have the latitude to cultivate more land of various types, they had better access to water, and a higher and more diverse range of goods from their farms [including higher numbers of small livestock]. They also had a higher diversity in terms of livelihood strategies, enjoyed relatively better food security as compared to those households that produce less. When it comes to the production of fish, they tend to produce more [on a per-hectare and per pond basis], they own larger and/or more ponds and are more likely to provide their fish with larger variety of nutritious feeds such as manure, compost and vegetable matter as compared to what the farmers who produced less. These were also found to primarily feed fish with relatively nutrient-poor maize bran.

In addition to the characterizations above, several other observations are worth noting. Andrew et al. (2003), Dey et al. (2007) and Hecht & Maluwa (2003) all found that, on average, fish-farming households have more acreage under crop cultivation as well as better farming practices as compared to the households that do not farm fish. Andrew et al. (2003) affirm that this was accurate in spite of the scale of production on the fish farm. Their privileged position in rural communities also had a positive influence in that they had more access to a perennial water supply as compared to other farming households (Hecht and Maluwa 2003, Andrew et al., 2003). It was also noted without surprise that fish farmers who reared fish on a larger-scale tended to consume smaller proportions of their harvested fish as compared to their counterparts who reared fish on a smaller-scale. Equally, the smaller-scale fish farmers elected to harvest their ponds frequently for their domestic consumption (Andrew et al., 2003).

With the view the above, there is a clear indication that family support as a contributor to the development of fish farming cannot be downplayed. The literature review has served to give a preview of the manner in which family support is put to use in the sector. Various aspects within the family that may also compromise the development of the sector have also been pointed out as reported from different jurisdictions around the world.

3. Research Methodology

This study used a mixed-methods approach with a cross-sectional research 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 enabled 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).

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

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 were 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 guides for the survey to collect information from the farmers, and interview guides for key informants. These key informants were chairpersons of the farmers' groups, and chief and county fisheries officers. The method in the collection of data in the research study had respondents personally interviewed (face to face). The study also used observation as one of the techniques whereby still photos and videos were taken. During and after fieldwork, there was transcription of qualitative data. Constant comparative analysis was used so as to ensure the information obtained had all the gaps filled. These data were coded into categories as a way of organizing them before being thematically analysed and categorized to fit into the goals and objectives of the study. Quantitative data after cleaning were pre-coded and fed into the Statistical Package for Social Scientists (SPSS) software (Version 20) package for purposes of chi square statistical analysis.

4. Results and Discussion

A Chi- Square goodness-of-fit test was performed to check whether there was a relationship between the use of family support on the fish farms and the development of fish farming in Busia County. The chi-square test was statistical test of choice based on the need to test the inferred relationship between the variables in the hypothesis as mentioned above. The Statistical package for Social Scientists (SPSS) Version 17 was used to run the test. From the findings in Busia County, the following was the outcome:

$$\chi^2 (2, N=210) = .000, p < .05$$

This therefore tells us that the support that farmers get from the family members does significantly influence the development of fish farming in Busia County. The above-described statistics are presented in table 2. The above test was run by comparing findings from the field data. The first was on how the farmers rated the importance of

family support on the fish farming enterprise. The second variable was the development trends that were drawn from comparing farmers records on the number of ponds on the farm against the weight in kilogrammes of fish harvested.

The study therefore rejects the null hypothesis (H_0) which states that there is no relationship between family support and the development of fish farming. This therefore statistically supports the notion that higher rates of development in fish farming in Busia County can actually be attributed to family support being engaged on the fish farms. Finegold (2009) agrees with the findings of the hypothesis test in positing that over 90 percent of African fish farming production sees ponds constructed and managed through the use of family labour. There were a number of factors that shed light on the reported findings.

The first possible explanation to the relationship between the use of family support on the fish farms and the development of fish farming was the availability and willingness of the family members to assist in the duties. Based on this, the farmer would allot duties on a daily basis or in some cases come up with duty rosters that would see each able-bodied family member get involved routinely. This ensured continuous care of the farm especially when farmers were not in a position to get back on time to feed the fish, they would simply contact their family members via mobile phone and instruct that the feeding be done. Follow-ups were also made using the mobile phones on the adherence of the duty roster. Additional duties such as security were also jointly carried out by family members. Farmers also attached a reward to due diligence given to the duties and in some cases, punished those who absconded their allotted responsibilities.

Table2: Chi-Square test for the relationship between family support and the development of fish farming

The Importance of family support to fish farming	Development of fish farming			Total
	Decrease	No change	Increase	
Less important	13	5	36	54
	6.2	13.4	34.5	54.0
	24.1	9.3	66.7	100.0
	54.2	9.6	26.9%	25.7
Highly Important	11	47	98	156
	17.8	38.6	99.5	156.0
	7.1	30.1	62.8	100.0
	45.8	90.4	73.1	74.3
Total	24	52	134	210
	24.0	52.0	134.0	210.0
	11.4	24.8	63.8	100.0
	100.0	100.0	100.0	100.0

The above-mentioned scenario is in tandem with that of Zeller and Sharma, (1998) who posit that family labour is by far the most important production factor in developing country agriculture, and maintenance and enhancement of labour productivity is central to securing and increasing income. This position is pre-empted by the rational choice theory propounded by Homans (1961) and, Friedman and Hetcher, (1990) who posited 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. Rational choice theorists also recognise that the threat of punishment or the promise of a reward may motivate people just as much as the punishment or reward itself. This therefore meant that family members respected the fact that farmers rewarded those who assisted in the farm work and punished those who ignored carrying out the duties allocated to them.

The second explanation to the relationship between family support and the development of fish farming revolved around the cost of accessing labour. Family labour on the farm was basically free which meant that the farmer spent less on farm expenses. The result would then be increased profit margins and thus more returns availed for the development of the fish farm. This position is further supported by the information given by one of the interviewees presented in the verbatim quote below.

Most of the times, the family helps with feeding the fish as a farmer may not be around during the day and the fish may need to feed around 10 am or 11 am. They can assist in feeding. They also top up the water, clean the pond and they also offer security during the day like chasing away the birds of prey. Family members can also assist in harvesting and delivering to customers and selling the fish. The family is an important resource as they cover these responsibilities, saving the farmer money that would have been used to pay a hired hand. Children are very important in this venture.

Source: Interviewee three

The above-discussed trend shows that even if the farmer may not have money on him/her, there is the assurance that the duties on the fish farm will be done. The above-mentioned statement is in agreement with that posited by Dixon, Gibbon and Gulliver (2001) who opine that many of the world's poorest people depend on family farming for their livelihood. Family farms account for almost 90 percent of the world's farms and in the case of Busia County, which according to the Kenya Integrated Budget Household Survey (KIBHS) (2009), falls within this bracket as it has a poverty rate of 66.7 per cent. This

therefore sees family labour as a vital resource that goes a long way in ensuring that the farmers in the region benefit immensely. It also supports a case for minimal reliance on hired labour which is required during specific times within the cycle of fish farming. The tasks that are undertaken are labour intensive and are also considered technical, beyond the capabilities available in the household. This is a position that is in tandem with the European Union (2017) whereby farmers and farm workers pursue agriculture as a part-time activity with the practice being characterized by seasonal labour peaks, where large numbers of workers may be hired for a relatively short period of time.

The third possible explanation to the relationship between the use of family support on the fish farms and the development of fish farming was the financial support/input by other family members towards the operations of these farms. This involved the purchase of fish feed, paying part-time labourers among others. The source of such financing often came with very flexible terms of repayment over staggered durations. These were often pegged upon the farmers receiving proceeds after sale. It was also noted that in some instances, the members did not ask for the refund since they felt that it was an initiative geared towards the welfare of the family in the long run.

The above mentioned trends are in tandem with the position taken by Omasaki, Charo-Karisa and Kosgey (2013) on fish production practices of smallholder farmers in three counties in western Kenya. As mentioned in their study, the family unit came out as an important source of manpower in the running of the enterprise. A significantly lesser part of the labour used was actually hired. The combination of family and hired labour was also commonly used. The above findings also tie up with the position taken by Takane (2008) who observes that family labour is a key asset for smallholder households in rural Malawi.

The findings disagree with those of El-Naggar, Nasr-Alla, and Kareem (2006) who carried out a study, seeking to examine the economic analysis of fish farming in Behera Governorate of Egypt. Their findings revealed that most farmers were married and thus, the implications of this was that this figure was expected to see an augmentation and enhancement of the use of family labour in the operations on the fish farms thus resulting to a reduction in the reliance and use of hired labour among the respondents in the area of study. Due to the lack of training of the farm managers in fish farm management, they were strongly convinced that this would translate to impending disaster to the sustainability of fish farming in Behera Governorate. The difference in this case and with that of Busia County was that the majority of the farmers belonged to farmers' groups and through these; they were able to access basic training on how to manage a fish farm. This knowledge is what they used to guide their family members who lent them a hand on the farm.

These findings also agree with the social network theory propounded by Friedkin (1993), who posits that the prevailing view of a person towards an action was determined by his/her, interaction with people/individuals within the network. This model therefore put forward a case of external stimuli influencing views by modifying the structure of the person's beliefs. The case of family members supporting fish farm demonstrates that the act of providing support is influenced by the consequence of benefits accrued to the running of the fish farms. It also is in agreement with the rational choice theory (Friedman and Hetcher, 1990) who propounded that human beings made decisions that are purpose and goals oriented. Once again, the decision to support the farm is geared towards the ultimate purpose of the family wellbeing.

The above-mentioned possible explanations have significant sociological implications as they give testimony to the functionality of a system within the family set up that is oriented towards the development of fish farming. This in light of the findings of the study which reported that the farmers got support from the family members in terms of labour as well as in terms of finance. This could possibly be achieved through the realization of the benefits from the farm to other members of the public, which as mentioned-above, include improved nutrition and access to finance to meet their various needs within the household and beyond.

5. Conclusions and Recommendations

This part presents conclusions and recommendations of the study based on results of the study.

5.1 Conclusions of the Study

There is a relationship between family support and the development of fish farming in Busia County. It was noted that this was an asset as majority of the farmers did not rely on hired labour. This was except when they required expertise such as during times of harvest. In spite of the fact that this source of labour was faced by a number of challenges, its contribution was indelible especially to the small-scale fish farmers in Busia County. The outcome is however different when the relationship between the variables was controlled by age whereby there was one age category that was seen to affect.

The above-mentioned possible explanations have significant sociological implications as they give testimony to the functionality of a system within the family set up that is oriented towards the development of fish farming. This in light of the findings of the study which reported that the farmers got support from the family members in terms of labour as well as in terms of finance. This could possibly be achieved through the realization of the benefits from the farm to other members of the public which as mentioned-above include improved

nutrition and access to finance to meet their various needs within the household and beyond.

5.2 Recommendations of the Study

Policies should be put in place by the relevant ministries in collaboration with the fisheries department of the County Government of Busia to promote the training offered to fish farmers to be inclusive of one or two of their family members. This will ensure that management of the fish farming enterprise by other family members is done from a point of knowledge. Critical aspects that family members should be trained in are on pond management (feeding, fish behaviour), record keeping as well as post-harvest handling. The ministries of education both at national and county level should also come up with basic programmes for schools in the County on fish farming so that they can enlighten the younger generation on the operations that go into managing fish farms. Of greater importance to the field of sociology is the need to have the trainings offered to farmers, as well as their family members, contain components that would promote conflict resolution and functionality/synergy within the units (family or groups/clusters).

The farmers who mostly are the owners of the fish ponds need to adopt a culture of involving their family members in the activities of the farm as much as possible. Resources allowing, the farmers should dig ponds to be owned by other family members. A significant percentage of the proceeds too should be controlled by them. The aim here, from a sociological perspective, is to create a sense of cohesion and solidarity and by extension, secure their commitment to the enterprise by enticing them with one of their own.

For recommendations for further research, it is worth carrying out a study on the age differentials and how they influence the development of fish farming in Busia County, Kenya

References

- Adewuyi, S. A., Phillip, B. B., Ayinde, I. A., & Akerele, D. (2010). *Analysis of profitability of fish farming in Ogun State, Nigeria*. Journal of Human Ecology, 31(3), 179-184.
- Andrew, T. G., Weyl, O. L. F., & Andrew, M. (2003). *Aquaculture Master Plan Development in Malawi: Socioeconomic Survey Report*. Aquaculture Development in Malawi, Report. Japanese International Co-operation Agency (JICA), Lilongwe, Malawi.

- Calus, M. (2009). *Factors explaining farm succession and transfer in Flanders*, PhD thesis, Ghent University, Ghent Belgium.
- Coleman, J. S. (1988). *Social capital in the creation of human capital*. *American journal of sociology*, 94, S95-S120.
- Collier, P., & Dercon, S. (2014). *African Agriculture in 50 Years: Smallholders in a Rapidly Changing World?* *World Development*, 63, 92-101.
- County, B. (2011). *Kenya County Fact Sheets*. Commission on Revenue Allocation. Link: (http://siteresources.worldbank.org/INTAFRICA/Resources/257994-1335471959878/Kenya_County_Fact_Sheets_Dec2011.pdf) Date retrieved: 20/10/2017
- Dey, M. M., Kambewa, P., Prein, M., Jamu, D., Paraguas, F. J., Pems, D. E., & Briones, R. M. (2007). *WorldFish centre-impact of the development and dissemination of integrated aquaculture–agriculture technologies in Malawi*. International research on natural resource management:
- Friedman, D., & Hatcher, M. (1990). *The comparative advantages of rational choice theory*. *Frontiers of social theory*, 214-29.
- Hecht, S. B., Kandel, S., Gomes, I., Cuellar, N., & Rosa, H. (2006). *Globalization, forest resurgence, and environmental politics in El Salvador*. *World Development*, 34(2), 308-323.
- Homans, G. (1961). *Social Behaviour: Its Elementary Forms*. London: Routledge and Kegan Paul.
- Jha, D. K., Pandit, N. P., Khanal, N. B., Ranjan, R., Mahato, I. S., Shrestha, M. K., ... & Egna, H. OUTREACH TO INCREASE EFFICIENCY OF AQUACULTURE IN NEPAL.
- Olufayo, M. (2012). *The Gender roles of women in aquaculture and food security in Nigeria*. Link: (<https://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/35118/olufayo%20iifet%20paper.pdf?sequence=5>) Date retrieved: 03/10/17
- advances in impact assessments. FAO/CAB International, Wallingford, 118-146.
- Dixon, J. A., Gibbon, D. P., & Gulliver, A. (2001). *Farming systems and poverty: improving farmers' livelihoods in a changing world*. Food & Agriculture Org.
- Edwards, R., Franklin, J., & Holland, J. (2003). *Families and social capital: Exploring the issues* (p. 1). London: South Bank University.
- El-Naggar, G. A. M. A. L., Nasr-Alla, A. H. M. E. D., & Kareem, R. O. (2006). *Economic analysis of fish farming in Behera Governorate of Egypt*. Department of Agricultural Economics, Obafemi Awolowo University, He Ife, Nigeria.
- European Union (2017) *Family Labour Force*. Link: (http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Family_labour_force) Date retrieved: 27/10/2017
- Finegold, C. (2009). *The importance of fisheries and aquaculture to development*. *America*, 1990(1980), 1970.
- Omasaki, S. K., Charo-Karisa, H., & Kosgey, I. S. (2013). *Fish production practices of smallholder farmers in western Kenya*. *Livestock Research for Rural Development*, 25, 1-16.
- Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of democracy*, 6(1), 65-78.
- Takane, T. (2008). *Labor use in smallholder agriculture in Malawi: Six village case studies*. Link: (http://jambo.africa.kyoto-u.ac.jp/kiroku/asm_normal/abstracts/pdf/29-4/29-4Takane.pdf) Date retrieved: 04/10/17
- Yamane, Taro. (1967). *Statistics, An Introductory Analysis*, 2nd Ed., New York: Harper and Row.
- Zeller, M., & Sharma, M. (1998). *Rural finance and poverty alleviation* (No. 8). International Food Policy Research Institute (IFPRI).