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What Influences Capacity of Fish Farmer Organizations? Experiences of CARP Fish Farmer Organizations in Dowa and Mchinji District in Central Malawi

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Abstract: This study examined factors that influence performance of fish farmer organizations in Mchinji and Dowa districts in central Malawi. Its focus was to analyze motivating factors that contributed towards formation of fish farmer organizations and also to examine factors that motivated farmers to join farmer organizations as well as those that affect the capacity of farmer organizations in promoting fish farming activities. Community action research approach was used for this study. All the five fish farmer organizations with 68 fish farmers involved in Community Action Research Programme (CARP) Fish Project were selected for the study. Data were analysed using content analysis, Discriminant Functional Analysis (DFA) and critical discourse analysis. Results showed that increasing income generation, enhancing household food security and ensuring access to credit facilities were the major motivating factors that acted as incentives for fish farmers to establish their farmer organizations and such factors influence the success of the farmer organizations. DFA further shows that the various socio-economic and demographic characteristics of the members have a significant influence on the capacity and performance of the farmer organizations. Based on the findings in this study, it is recommended that farmer organizations should be adequately orientated on importance of the identified factors to ensure effective and sustainable fish farmer organizations.

Key words: action research, fish farmer organization, organizational performance

1. Introduction

A number of approaches have been devised to enhance agricultural development in Sub-Saharan Africa region [1]. Establishment of farmer organizations is one of the approaches aimed at mobilizing smallholder farmers to undertake collective action as strategy to enhance agricultural development. It is through the generic understanding of collective action that most of the recent agricultural development policies, strategies and frameworks in Sub-Saharan Africa have emphasised the need for robust and sustainable vibrant farmer organisations in attaining sustainable agricultural development. Further, the 2008 World Development Report on Agriculture Development places strong emphasis on promotion of farmer organizations to help bring about what it calls a smaller holder revolution in order to improve farmers' livelihoods.

Before the introduction of decentralisation policies, agricultural development and other natural resources management in most countries in sub-Saharan Africa were implemented through central governments where a centralized managed system was in place [2]. This conventional approach appeared to be ineffective in most aspects of sustainable agricultural development and natural resources management. This was largely because despite emphasising on the top-down approach in which policies were strictly developed by central

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governments, most of the governments in Sub-Saharan Africa rarely possess enough personnel or financial capacity to implement their socio-economic policies adequately. Farmer organizations have therefore been one of the strategies to depart from centralized systems to decentralized approaches in agriculture development in Africa [1].

In literature, there are several definitions of farmer organizations which outline key characteristics that distinguish farmer organizations from other types of rural organizations involving small holder farmers. Kassam et al. (2011) [3] and Scott (2004) [4] define an organization as a group of people within a society who follow particular rules and norms to accomplish specified goals. Most definitions emphasize membership as a key feature of farmer organizations [5], provision of services to their members as the key function of the organizations [6] and access to these services as the key reason for becoming a member of a farmer organization [4]. Considering these characteristics, Stockbridge et al. (2003) [7] define farmer organization as a formal voluntary membership organization created for the economic benefit of farmers to provide them with services that support their farming activities. Such services are reported by Williamson (2000) [8] who asserts that apart from increasing access to extension services and credit, collective action in form of smallholder farmer organizations is essential for reducing market transaction costs and consequently improving performance of rural markets. This assertion is consistent with Hellin et al. (2007) [6] who report that by belonging to farmer organizations, smallholder farmers attain some market power, increase access to input and output markets as well as improve their competitiveness on the market. To this end, collective action is a key factor for the survivability, sustainability as well as effective performance of the fish farmer organizations.

However, despite increased emphasis on involvement of farmer organizations in aquaculture production, the challenge in Malawi is that there is no comprehensive and empirical evidence on factors that influence performance of the fish farmer organizations [8, 9]. Lack of in-depth understanding of such factors defeats the whole essence of farmer organization approach in aquaculture production. This case study was therefore designed to establish and examine factors affecting capacity of the farmer organizations in promoting fish farming activities in Dowa and Mchinji districts in central Malawi. The study was motivated by the inadequate substantive empirical evidence on key factors that determine successful farmer organizations or institutions. It was therefore expected that information generated through this study would contribute significantly towards policy making decisions for farmer organizations, practitioners, governmental and non-governmental organizations, donor partners and other relevant key players involved in farmer organizational development.

2. Methodology

2.1 Research Procedure

The five CARP-fish farmer organisations were purposively selected for the study in Dowa and Mchinji districts in central Malawi. All the 68 fish farmers in the five organisations were selected for the study. The study applied community action research approach. Action research was a process through which the researcher and fish farmers jointly identified problems affecting performance of the fish farmer organisations. This was followed by collection and analysis of information on the identified problems which eventually led to joint identification of possible solutions to the challenges to improve capacity of the fish farmer organizations in promoting fish farming. Fish farmers acted as co-researchers during the study. Data collection comprised focus group discussions with fish farmers, face to face interviews with individual members of the organisations, participant observation and key informant interviews. A checklist and semi-structured questionnaire were used during

focus group discussions and face to face interviews, respectively. Both qualitative and quantitative data were collected. Data analysis comprised content analysis, critical discourse analysis (CDA) and discriminant functional analysis (DFA).

Qualitative data was subjected to critical discourse analysis (CDA) in order to understand issues of power, governance and decision making within the fish farmer organizations. In social sciences, CDA is an interdisciplinary approach to the study of discourse that views language as a form of social practice and focuses on the ways social and political domination are reproduced in text and talk [10]. In this study, therefore, the CDA was used to understand the overarching issues within the local communities that had an influence on performance of the fish farmer organizations. Apart from the CDA, content analysis was applied to summarize qualitative data. Various literature [11-13], define content analysis as a methodology in social sciences for studying the content of communication. As a data analysis tool, it was used to determine the presence of concepts and themes within datasets in order to determine and examine the perceived factors that affected the performance of the farmer organizations.

A Discriminant Function Model (DFA) was used in order to isolate factors that influence member participation in the activities of fish farmer organizations. According to Breyer (2005) [14], DFA is used to determine which variables discriminate between two or more naturally occurring groups. Therefore, this analytical tool was used to investigate the variables which discriminate between members who participated and those who did not participate in the key activities within the farmer organizations. The DFA was therefore used to determine the variables that were best predictors of members' likelihood to participate in the organizations activities or not. The following DFA model was therefore used with different probable variables:

$$Y = f(\beta_i, X_i) + e$$

where Y is the latent variable (participation in organisational tasks) formed by the discriminant function, β_i is discriminant coefficients, e is the error term and X_i are probable discriminating variables. Table 1 shows the probable discriminating variables.

Table 1 Probable member-specific factors affecting performance of the farmer organizations.

X_1= Household size	This is a continuous variable showing the number of members per household.
X_2= Educational status of head of household	This implies farmer's education level. This is included as a dummy variable with1 if the farmer is literate 0, if otherwise
X_3= Age of head of household	This entails age of the farmer measured in years as a continuous variable.
X_4 = Experience in fish farming	Year of farming experience, measured in number of years
X_5 = Pond area	This is a continuous variable indicated in square metres (m^2)
X_6 = Social status in community	The status that the farmer holds within the local community such as leadership title; 1 if farmer has a title and 0 otherwise.
X_7= Land holding size	Land holding size is recorded in hectares. It will include all land owned by the household members.
X_8 = Access to extension service	Contact with extension agent, measured by the frequency of contact or participation at cooperative meetings.
X_9 = Average income	Average amount of income earned by a household per year in US$?
X_{10} = Access to loans	The possibility of getting loans through the farmer organizations; 1 if they can obtain loans and 0 if otherwise.
X_{11} = Access to markets	Entails distance to markets where the farmers sale fish. The distance will be measured in kilometers.

3. Results and Discussion

3.1 Gender Participation in Sampled Fish Farmer Organizations

Results revealed that of the 68 CARP fish farmers, in the five fish farmer organizations, 75 percent and 25 percent were male and female members, respectively. The gender disparity across the farmer organisations was also found to be significant (χ^2 = 17.515, df = 1, P = 0.00) with the number of male fish farmers being significantly higher than that of female members (P < 0.05). The gender disparity was observed across the four fish farmer organisations except *Gwirampini* farmer organisation in which the percentage of male and female members was equal (Table 2).

Table 2 Membership within the fish farmer organizations according to Gender (n = 68).

Name of farmer organization	Percentage (%) gender participation	
	Male	Female
Khumbirani	92.3*	7.7*
Nthawimchuma	87.5*	12.5*
Phindulathu	73.3	26.7
Gwirampini	50.0	50.0
Chikondi	61.1	38.9

χ^2 = 17.515, df = 1, P = 0.00, * = significant at P < 0.05

This gender disparity between men and women confirms the existent trend in gender participation in fish farming activities in Malawi, where according to Halfyard et al. (2005) [15], in their study on constraints to women participation in fish farming found that the aquaculture and fisheries sectors are dominated by men. It was also noted that the participation of women in decision making and leadership positions within the organisations was very low compared to men's involvement. Women assumed a meager 32 percent of leadership and decision making positions while men took 68% of the leadership positions (Fig. 1).

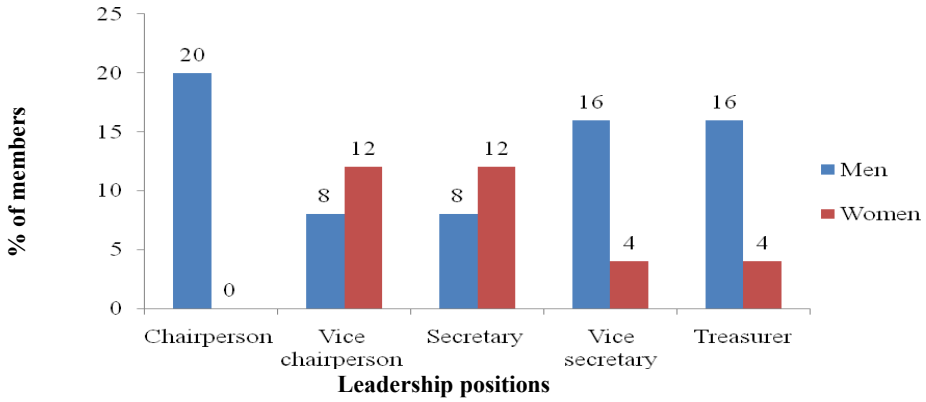

Fig. 1 Percent participation of men and women in leadership positions.

The key informant interviews revealed that the most senior decision making positions allocated to female members included the secretarial and treasurer positions of the farmer organizations. Considering that these two positions require commitment and faithfulness, such positions were usually allocated to female members as women were regarded more committed in record keeping and also faithful in handling organizational assets such as records and financial resources in comparison with male members. This finding is consistent with assertions by Chamala and Shingi (2007) [16] who in their study, found that female members of the farmer organizations were generally custodians of the organizations' assets.

Further, it was noted that positions of secretary and treasurer called for members who had low cases of absenteeism during committee meetings and any other organizational forums. Against this background, it was therefore noted that in all the farmer organizations in Dowa and Mchinji, female members of the organizations were more committed and also showed low rates of absenteeism during various institutional gatherings. Thus, this was the likely reason for their choice as office bearers in more demanding positions within local communities albeit these not being part of the highest decision making positions. Focus group discussions with the members also suggested that allocation of positions within the farmer organizations was usually determined on whether the position was suitable for a man or woman. For instance, men were more likely to assume the position of chairperson while women had a high chance to be allocated position of secretary. This therefore implies that gender plays a significant role in the allocation of responsibilities, which eventually affects capacity of the fish farmer organizations in the final analysis.

3.2 Reasons Prompting Farmers to Join Fish Farmer Organizations

Results in Fig. 2 show the major reasons which motivated farmers to become members of the fish farmer organisations. Face to face interviews with the fish farmers revealed that the major reasons were to enhance income generation and food security and to increase their access to credit facilities especially agricultural inputs. Further analysis indicated that 13 percent of the farmers reported that they became members of the organisations because they were advised by funding organisations while 2.9 percent of the respondents in each case, revealed that they became members of the organisations because they had inherited fish ponds from relatives and for prestige, respectively. Inheritance of the ponds happened as a result of death, old age and migration of initial owners to other areas. Migration of some members was attributed to searching for employment and marriage away from their local communities. Other reasons for farmers to engage in fish farming were as follow: being advised by extension workers and funding institutions, members emulating fellow fish farmers and the high prices of fresh fish. It appears however that enhancement of income and advice by the funding institution were major contributing factors for farmers to engage in fish farming activities (Fig. 2).

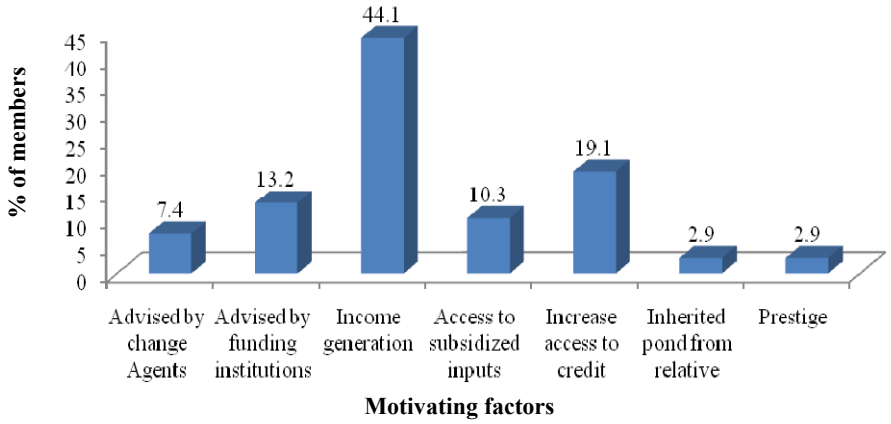

Fig. 2 Reasons for farmers to engage in fish farming.

These results imply that farmers had various expected benefits and services, i.e., income generation, access to credit facilities especially agricultural inputs that they thought they would obtain if they had joined the farmer organizations. The realization of their expected benefits as a result of joining the organizations acts as an incentive for members of the organizations to sustain their participation in the farmer

organizations which eventually correlates positively with success of the farmer organizations. On the other hand, if the farmers feel that they are not getting their expected benefits, they may decide to reduce their participation or completely discontinue with the membership of the fish farmer organizations. This may in the final analysis affect capacity and performance of the fish farmer organizations. Further, the reasons that some of the farmers cited as rationale for their membership for example prestige and inheritance of fish ponds depicted in Fig. 2 could not bring a strong and significant desire for members to commit themselves in the operations of their organizations. Consequently, this can negatively affect participation of such members to the extent that, in the final analysis, the general performance of the organizations could also be negatively affected.

Advice from the funding organisations was the other motivating factor for establishment of the farmer organisations (Fig. 2). This could also be a drawback which consequently may have affected capacity of the farmer organisations in promoting fish farming among local communities. Since the idea for establishing the farmer organisations was originated through external influence from members of the funding organisations, the need for strengthening their organisations was not high on the members' agenda. This was another factor for the inevitability of the farmer organisations' failure in promoting fish farming. In essence, this assumes that the nature of how the farmer groups were established has a significant influence on capacity and general performance of the organisations. Findings indicated that events such as haphazard mobilisation and inadequate consultation with local communities during establishment of the farmer organisations had a significant effect on their performance. With an already planned target to establish farmer organisations, the funding organisations resorted to shortcut methods of establishing farmer organisations before the farmers had understood and embraced the idea and rationale for forming the organisations. Further, the extension workers mobilized farmers to form their groups in an oversimplified manner, suggesting that unless they were organized into cooperatives or associations or groups, they would not get subsidies or access to credit. There was therefore over-dependency of the farmers on the funding organisations. Such dependency reduced farmers' commitment to gain and apply appropriate knowledge on organisational development. This contributed significantly towards lack of commitment among the farmers to demand extension services in order to enhance performance of their organisations to promote fish farming.

3.3 Member-specific Factors Affecting Fish Farmer Organizations

Discriminant Function Analysis (DFA) was conducted on a number of member-specific factors. Examination of these factors was done with the following assumption: The member-specific factors could have a significant influence on capacity and performance of the fish farmer organizations. In this regard, the member-specific factors which include socioeconomic and demographic characteristics of the fish farmers were independent variables while members' participation in carrying out various tasks in the organizations was dependent variable. Using action research, the farmers and the researcher identified the main tasks that were being undertaken in the farmer organizations. These included setting or formulation of institutional rules, monitoring rule conformance and leadership and decision-making. Applying the DFA, tests of equality of group means were conducted for the three selected tasks to determine the relevant member-specific factors that had significant influence on the participation of members in any of these main tasks or activities in the farmer organizations. Results (Table 3) show that the overall Wilks' Lambda in each of the three cases: Setting institutional arrangements, monitoring rule conformance and leadership and decision-making was significant. This implies that the DFA model used in the study was valid for predicting

the parameters that may have influenced the participation of members in the key activities as well as the performance of the organizations.

Table 3 Test of equality of group means for member participation in setting institutional arrangements, monitoring rule conformance and leadership and decision-making.

Variable	Setting rules			Monitoring rule conformance			Leadership and decision making		
	Wilks' lambda	Sig.	Cor.coeff.	Wilks' lambda	Sig.	Cor.coeff	Wilks' lambda	Sig.	Cor.coeff
Household size	0.994	0.368	.306	0.777	0.883	-.219	0.782	0.007*	.225
Level of education	0.789	0.875	.207	0.983	0.121	.18	0.983	0.243	.239
Age	0.996	0.000**	.930	0.801	0.000**	.970	0.845	0.000**	.969
Experience in fish farming	0.504	0.561	.052	0.53	0.774	-.023	0.589	0.032*	.642
Pond area	0.920	0.012*	.577	0.997	0.761	.546	0.929	0.845	-.260
Social status	0.998	0.041*	.311	0.921	0.030*	.255	0.579	0.902	-.200
Land size	0.999	0.777	-.107	0.990	0.238	.18	0.987	0.171	-.110
Access to ext services	0.456	0.765	-0.267	0.995	0.383	-.231	0.999	0.758	-.070
Household income	0.237	0.654	0.897	0.987	0.765	.987	0.876	0.798	.237
Access to credit	0.994	0.562	0.231	0.777	0.643	-.012	0.782	0.735	.011
Access to markets	0.789	0.123	-0.012	0.983	0.654	0.078	0.983	0.021*	.567

* = Significant at $P < 0.05$;** = Significant at $P < 0.01$

86.3% of grouped cases correctly classified for setting rules

89% of grouped cases correctly classified for monitoring rule conformance

84.2% of grouped cases correctly classified for leadership and decision making

Further analysis shows that for community participation in setting the rules, 86.3 percent of the grouped cases were correctly classified while for monitoring rule conformance, 89 percent of the group means were correctly classified. For leadership and decision making, 84.2 percent of the grouped cases were correctly classified. This means that 86.3 percent, 89 percent and 84.2 percent of all the variables for setting the rules, monitoring of rule conformance and leadership and decision making, respectively in the discriminant scores were explained by the model. This implies that the DFA model used in the study for all the three tasks was significant and could effectively be used to discriminate variables that had significant influence on the members' choice on whether they would participate in the three key activities or not.

The DFA shows that some member-specific factors affect capacity and performance of the farmer organizations while others appear to have no influence. Results revealed that age, pond area or size and social status had a significant influence on member participation in setting or formulation of rules. Significant differences ($P < 0.05$) were noted among the variables in question indicating that they were significant in the model. Further, age and social status were also found to be significant in influencing members' participation in monitoring rule conformance. Finally, household size, age, and experience in fish farming were the variables which seemed to have a significant effect on member participation in leadership and decision-making.

To expound on these results, Table 3 shows that household size was significant ($P < 0.05$) for member participation in leadership and decision making. This implies that members who have larger household size have a high likelihood to participate in leadership and decision making, as shown by the positive correlation ($r = 0.225$) between household size and leadership and

decision making. This could probably be attributed to the fact that fish farmers who head large households were most likely to be elderly and respected members of the society and were usually conferred with leadership and decision making responsibilities in the farmer organizations. On the other hand, it appeared larger families (≥ 7-9 members per household) had more workers (labour) and hence a higher probability of participating in fish farming activities. This could also provide a high chance for members of such households with leadership and decision making positions in the fish farmer organizations. These results strongly support the argument that households with large families are in a better position to participate in fish farming while the converse is true for small households [15]. Therefore, household size is one of the factors which influence the capacity and performance of the fish farmer organizations.

Discriminant analysis showed that age was a determining factor for members to participate in setting institutional arrangements, monitoring of rule conformance by members and leadership and decision-making. The standard correlation coefficients showed that age was positively correlated with community participation in setting institutional rules (r = .930), monitoring rule conformance (r = .970) and leadership and decision making (r = .969). This implies that older people (> 40 years old) were more likely to participate in most of the major tasks in the farmer organizations as compared to younger people (< 40 years old) who could, under normal circumstances opt for other occupations that may provide immediate returns to investment rather than fish farming, e.g., preferring tobacco growing to fish farming. The significance of age of members in the study shows that the three tasks (setting institutional arrangements, monitoring rule conformance and leadership and decision-making) require to be undertaken by mature members of the society who can be respected by their fellow members and subjects. Hence, the positive correlation between the three tasks and age implies that the elderly members are more likely to take a leading role in undertaking the tasks. The implication for this setup is that if such tasks and responsibilities were offered to younger members, there would be a high chance that they would fail to succeed in such tasks which could negatively affect the organizational capacity and performance. It therefore implies that age has a significant influence in the performance of the farmer organizations.

Experience in fish farming was also noted to be significant ($P < 0.05$) on member participation in leadership and decision making. Results suggest that experience in fish farming was positively correlated (r = .642) with leadership and decision making. This implies that those members who had more experience in fish farming were more likely to act in leadership and decision making position. It can therefore be concluded that members' experiences in fish farming such as the number of years since farmers commenced fish farming have a significant influence in performance of the fish farmer organizations. Similarly, results indicated that pond area was also a significant factor in influencing members' participation in setting institutional arrangements. This means that members who had larger pond area or sizes were likely to take part in setting up rules for governing the fish farmer organizations. This could be attributed to the fact that such members with larger fish ponds have an incentive to ensure that their fish ponds were well protected especially from theft and other hazards such as predation. Effective protection of their resources can be achieved by setting up rules to deter outsiders from accessing and capturing the resources from the fish ponds.

DFA further showed that social status was significant ($P < 0.05$) for influencing members' participation in setting institutional rules and monitoring rule conformance. Further analysis indicates that social status had a positive relationship with setting and conforming to the institutional rules. This implies that members who had some status such as

leadership e.g. village headman or leadership in other community based organizations or committees had higher chance to take a leading role in setting up rules and designing strategies for monitoring rule conformance by members of the fish farmer organizations. Therefore, social status of the members has a significant influence in the effectiveness of the fish farmer organizations which consequently would as well affect capacity and performance of the organizations.

Access to markets was also one of the variables that seemed to have a significant (P = 0.021) influence on member participation in leadership and decision making. During the study, it was reported that the main incentive for fish farmers to join farmer organizations was income generations. However, the major drawback with regard enhancement of income generation was the inadequate markets for fish, to the extent that those members who appeared to have access to fish markets which could also be accessed by the fellow members of the organizations had a high chance of assuming leadership and decision making positions within the fish farmer organizations. The lack of fish markets to a large extent acted as a disincentive for fish farmers to fully participate in the activities of the farmer organizations. Key informant interviews and face to face interviews further suggested that 90 percent of the members looked upon fellow members who had linkages with potential markets to assist them sell their fish stocks during harvesting. Thus, those who had linkages to markets were conferred with leadership and decision making powers. Hence, access to fish markets had a significant influence on performance of the fish farmer organizations.

4. Conclusions

The study has shown that gender participation between male and female members of the organisations have a significant influence on capacity and performance of the organisations. It has also been shown that the major reasons that motivated farmers to establish the fish farmer organisations included enhancing income generation and increasing access to credit facilities. Advice from the funding organisations was the other motivating factor for establishment of the farmer organisations. In the final analysis, these motivating factors appeared to have significant influence on the capacity and performance of the fish farmer organisations. Lastly, the DFA has revealed that age, pond area or size and social status had a significant influence on member participation in setting or formulation of rules. Further, age and social status were also found to be significant in influencing members' participation in monitoring rule conformance. Finally, household size, age, and experience in fish farming were the variables which seemed to have a significant effect on member participation in leadership and decision-making.

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