

## The Efficacy of Participatory Action Research on Capacity of Local Farmers Organisations to Promote Fish Farming in Malawi

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### ABSTRACT

A cross-sectional study was conducted to examine the efficacy of participatory action research approach on capacity of farmer organisations in promoting fish farming operations among local communities in Dowa and Mchinji districts in central Malawi. Purposive sampling technique was applied to select five fish farmer organisations in the study area. The farmer organisations comprised 68 fish farmers. Participatory action research approach was used in the study. Face to face interviews, focus group discussions and participant observation were applied as data collection methods. Data analysis was done using descriptive statistics and content analysis using narratives. Results showed that both institutional and technical challenges affected the farmer organisations to promote fish farming operations. It has also been observed that there was a significant increase ( $P < 0.05$ ) in the level of knowledge (from 1% to 93%) and application of recommended practices (from 7-46% to 60-90%) for fish farming and for the development of robust and vibrant fish farmer organisations (from 0-9% to 70-97%) after implementation of participatory action research interventions. It is therefore recommended that extension service providers should apply participatory action research if they are to target the real or felt needs of the farmers which will enhance agricultural production in the final analysis.

**Keywords:** Participatory action research, Farmer organisations, Fish farming, Capacity building.

### INTRODUCTION

Participatory Action Research (PAR) is an inquiry process intended to solve practical problems and generate new knowledge through collaborative efforts by researchers and other clients such as members of farmer organisations [1]. It is an applied research approach, in which participant communities take on an active co-researcher role in facilitating improved practice through the direct application of research findings in a practical context [2]. The participatory action research theory states that experience can be a basis of knowing and that experiential learning can lead to a legitimate

form of knowledge that influences practice. The theory posits that communities who experience the problem are in the best position to conduct research on the issue in question, and after the inquiry process, such communities are empowered [3,4]. This perspective strongly supports the work of Freire [5] who used PAR to encourage the poor and deprived local communities to examine and analyse the structural reasons for their oppression [2,3,6,7] and to determine possible interventions to improve their well-being. Against this background, PAR developed as an approach for enabling researchers to work in partnership with local communities in a manner that leads to

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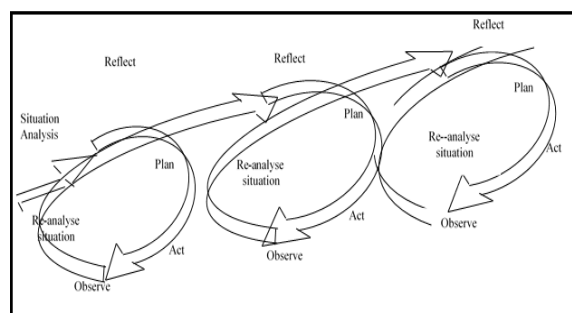
actions to improve the livelihoods of people in a society.

Participatory action research therefore differs from conventional research which often assumes a top-down approach as in the transfer of technology and/or knowledge in two ways. Firstly, PAR focuses on research whose purpose is to enable action [4,8]. The action is achieved through a reflective cycle, whereby participants collect and analyse data, then determine what action should follow. The resultant action is then further researched and an iterative reflective cycle perpetuates data collection, reflection and action [4]. Secondly, as opposed to other approaches, PAR pays careful attention to power relationships, advocating for power to be deliberately shared between the researcher and the researched [9]. The researched (local communities) cease to be objects and become partners in the whole research process including selecting the research topic, data collection and analysis and deciding what action should happen as a result of the research findings [8]. This entails that PAR actively involves local communities being researched in the inquiry process, with research objectives designed to aid in producing practical outcomes for improving livelihoods of the communities themselves. In this case, the problem originates in the community and it is then defined, analysed and solved by the community itself. What is key in this process (PAR) is that researchers have confidence in the capacity of local communities to name their reality and become their own researchers in seeking answers to their challenges [4,8].

Based on these rewards which PAR provides, with support from the Regional University Forum for Capacity Building in Agriculture (RUFORUM), the researchers who are also authors of this paper through the Lilongwe University of Agriculture and Natural Resources (LUANAR) implemented a three-year Community Action Research Programme (CARP)Fish Project in Dowa and Mchinji districts in central Malawi from 2012. The aim of the project was to enhance fish production of small-scale farmers. Participatory action research approach was used in implementing the project where researchers from LUANAR in collaboration with the local community members (in this case fish farmers) inquired into

the problems affecting their organisations in order to promote fish farming. The approach involved collection and analysis of information about the jointly identified problems, which eventually led to further brainstorming and identification of possible solutions and/or interventions to the challenges. Thereafter, plans for the agreed upon interventions were developed and implemented. This was followed by monitoring and evaluation of the effectiveness of the interventions on the capacity of farmer organizations to promote fish farming. The distinctive feature of this approach was that the researchers and community members were actively involved in a systematic assessment using an iterative process (Figure 1) to identify specific problems for the purpose of solving them, with an aim of enhancing the troubleshooting capacity of the farmer organisations. Figure 2 shows an overview of the participatory action research process for the study.

By using the participatory action research approach, it was assumed that implementation of the CARP Fish Project would target the real needs of the farmers which could eventually lead to development of the farmer organisations with enhanced capacity to promote fish farming at the local level. This study was therefore conducted to examine the efficacy of the participatory action research approach applied in the study area. This study presents the challenges affecting the fish farmer organisations which were collaboratively identified by both staff of the CARP Fish Project and the fish farmers. It also presents the interventions which were implemented to solve the identified challenges. Finally, the study examines the effectiveness of the PAR interventions in enhancing capacity of the farmer organisations in promoting fish farming.



**Figure 1.** Iterative participatory action research model

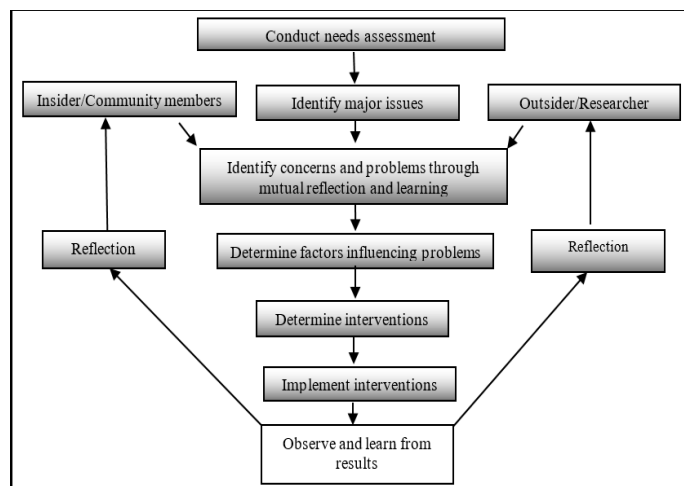


Figure 2. An overview of community action research process for the study

## MATERIALS AND METHODS

### Study Area

This cross-sectional study was conducted in Dowa and Mchinji districts in central Malawi. Dowa is located 13°35'S, 34°00'E and about 1300 m above the sea level. It receives about 800 mm to 1000 mm rainfall per annum, with annual temperature ranging from 15 °C to 22 °C. It is situated about 40 km north of Lilongwe the capital. The district covers an area of about 3,041 km<sup>2</sup> and has an estimated population of 556,678. On the other hand, Mchinji is located 13°45'S, 33°05'E and about 1200 m above the sea level. It receives about 1000 mm to 1200 mm rainfall per annum, with annual temperature ranging from 17 °C to 25 °C. It is situated about 110 km west of Lilongwe the capital. Mchinji covers an area of about 3,356 km<sup>2</sup> and has an estimated population of 324,941 [10]. In Mchinji, three Agricultural Extension Planning Areas (EPAs) were targeted for the study while in Dowa, the study was conducted in one EPA. The EPAs were locations where the Community Action Research Programme (CARP) was implementing its activities. Purposive sampling was used to select five fish farmer organizations that were under the CARP Fish Project. Four farmer organisations were identified in Mchinji namely Chikondi, Gwirampini, Nthawinchuma and Phindulathu fish farmer organisations, and one farmer organisation was selected in Dowa known as Khumbirani fish farmer organisation.

### Data Collection and Analysis

In March and April 2015, both qualitative and quantitative data were collected. The farmer organisations had a total number of 68 farmers who

were members. Data was collected using face to face interviews and focus group discussions with the fish farmers aided by semi-structured questionnaires and checklists respectively. In addition, key informant interviews with the District Fisheries Officers from the two districts were conducted. Data obtained were subjected to the Statistical Package for Social Scientists (SPSS) version 16.0. Data were analysed using content analysis, critical discourse analysis and descriptive statistics. Descriptive statistics comprised Chi-square ( $X^2$ ) test, means and percentages.

## RESULTS AND DISCUSSION

### Challenges and Interventions

Fish farmer organisations were affected by both institutional and technical challenges (Table 1). Whilst all technical challenges were present in all fish farmer organisations, inadequate knowledge on appropriate recommendations for organisational development was the only institutional challenge present in all groups. Nthawinchuma group was the only group with both institutional and technical challenges, whereas Gwirampini group had the least challenges. Chi-square tests revealed that the variations in responses by members of the groups with respect to both institutional and technical challenges were significantly different ( $P < 0.05$ ). This implies that the challenges weighed differently to the different farmers in their respective groups with reference to how they perceived them to affect the capacity of the farmer organisations in promoting fish farming. For instance, results showed that the highest percentage (between 76.9% and 93.8%) of members singled out lack of knowledge on appropriate recommendations for organisational development as the major

institutional challenge while a lower proportion (<50%) of members suggested that lack of commitment, inadequate trust among members and restriction of spouses were equally important challenges affecting their groups.

Supported by findings from the face to face interviews with the fish farmers, inadequate support and encouragement from extension workers was deemed the second major challenge affecting the farmer groups. It was revealed that since there were no field extension workers specifically advising the farmer groups at the local level, the groups relied solely on District Fisheries Officers (DFOs) for professional organisational advice in fish farming. The challenge from this was that the DFOs (one each for the two districts) have limited mobility and access to all fish farmer groups because of the large area coverage under their jurisdiction.

In terms of the technical challenges, the percentage of members who had reported on occurrence of these challenges across the farmer groups ranged from as low as 15% to as high as 100%. As was the case with the institutional challenges, some of the technical challenges appeared to have stronger influence on capacity of the members to carry out fish farming than the others. However, based on the proportion of members, results show that inadequate inputs for carrying out fish farming was the major technical challenge.

A list of suggested interventions for solving the prioritised challenges affecting the fish farmer organisations are summarized in Table 2. During focus group discussions and the key informant interviews, it was observed in some instances, that common problems affecting the different organisations called for solutions that differed from one organisation to the other. For instance, whilst both Phindulathu and Chikondi farmer organizations identified inadequate commitment of members in governance of the farmer organisations and management of fish ponds as an important challenge, they generated different suggested solutions. Phindulathu farmer group suggested sensitisation meetings and training of the farmers while Chikondi farmer group proposed farmer visits, on-farm demonstrations and holding of group discussions among farmers as relevant interventions towards generating ideas on promoting effective governance of the farmer groups and fish farming activities.

This variation reveals how the participatory action research approach enabled members of the different

fish farming organisations to contextualise their problems irrespective of the sister groups present, so as to call for the relevant but dissimilar interventions amongst them. The selected interventions by each fish farmer organisation were therefore considered as the appropriate options for enhancing performance of the respective farmer groups in promoting fish farming activities.

### Members Level of Knowledge on Recommended Practices for Farmers Organisations

As a way of examining efficacy of the participatory action research approach (PAR) used, the members' level of knowledge on recommended fish farming practices for fish farmer organisations was assessed before and after the PAR intervention during the study. The level of knowledge assessment on recommended practices for fish farmer organisational performance gave a picture of the extent to which farmers knew key practices for effective performance of fish farmer groups. Using a Likert scale to show results of the oral test, members who scored 0-25%, >25-50%, >50-75% and >75-100% in the oral test had the lowest level of knowledge, low level of knowledge, high level of knowledge and highest level of knowledge, respectively (Figure 3).

The assessment revealed that before the PAR interventions, most (85%) of the members knew only 0-25% of what they were supposed to know on recommendations for effective farmer group performance. Conversely, after the PAR interventions, results show that 93% of the members across the fish farmer organisations knew >75-100% of what they were supposed to know; implying that the members had acquired more knowledge on organisational development after the PAR interventions.

The members of the respective fish farmer groups in the study acknowledged that through implementation of various PAR interventions, particularly training of the farmers, establishment of study circles as well as introduction of lead farmers, they had acquired new knowledge which they did not have before the CARP Fish Project. Further, members expressed that through implementation of PAR, they had not only improved their practical fish farming capabilities, but more importantly boosted their morale and motivation which eventually improved the performance level of their respective fish farmer organisations. Thus, the process of participatory action research appeared to have



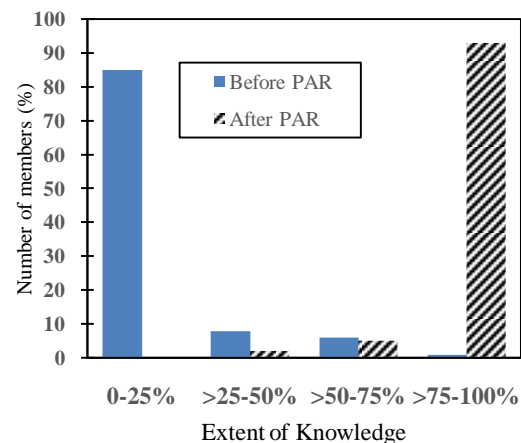
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created greater awareness among the farmers for enhancing self-reliant development through undertaking fish farming operations.

The inadequate knowledge that members had before the PAR interventions was attributed to lack of training in organisational development among members. Farmers reported that since inception of the farmer groups before the CARP Fish Project, they had never been trained in organisational development. This, coupled with the fact that formation of the groups was not an internal idea amongst them, acquiring knowledge on recommended practices did not stand out as a priority on the farmers' agenda. There was really little motivation among farmers to take the initiative of demanding relevant extension services to enhance their knowledge on organisational development, seeing they had very poor understanding of what good practices really constitute.

Nevertheless, despite lack of training before the CARP Fish Project, very few members had some knowledge on recommended practices for effective farmer organisations obtained from prior participation in other local organisations within village development committees (VDCs). VDCs have institutional arrangements which can also be applied in the governance of fish farmer groups. In the same vein, key informant interviews with extension workers and the local leaders revealed that culturally, all local communities had particular institutional arrangements other than VDCs within the context of their societal traditions and norms. However, although members were able to develop and govern their groups based on local institutions and traditional or cultural values existing within the institutional environment, this was not adequate to provide them with relevant knowledge on recommended practices to undertake effective governance of fish farming organisations. This suggests that before the PAR interventions, a proportion of the low knowledge level by some members of the fish farmer organizations may have been based on their personal experiences from other local institutions such as VDCs in governing their farmer groups.

Consequently, the farmer organisations had remained ineffective before the PAR interventions. This reveals the significant contribution of participatory action research interventions in enhancing capacity of farmer organisations in promoting fish farming.



**Figure3.** Percentage level of knowledge of farmers on recommended practices

### Proportion of Members with Knowledge on Recommended Practices for Fish Farming

The level of farmers' knowledge across specific categories of recommended practices in fish farming were assessed both before and after the PAR interventions. Generally, a higher proportion of the farmers had higher knowledge levels after the PAR interventions than before the PAR interventions under the CARP Fish Project (Figure 4).

This result shows that most farmers had inadequate knowledge of key recommended practices in fish farming before the PAR interventions despite introduction of fish farming technology through the initiative of various projects such as the Malawi Social Action Fund (MASAF) and the Local Development Fund (LDF). Even for the few members who had some knowledge, the extent of what they were supposed to know about key practices for fish farming was inadequate to implement and promote fish farming operations effectively as a viable investment. A similar finding was reported by Sarma et al. [11] who observed that adequate knowledge of farmers on recommended practices has a profound influence on the success of fish farming investment. The increase in the proportion of members who had knowledge on recommended fish farming practices after the CARP Fish Project suggests that the PAR interventions were more effective in promoting fish farming as opposed to the period before. This assertion agrees with Adesoji and Kerere [12] as well as Herr and Anderson [6] who observed that participatory action research in has a significant influence on the success of farmer organisations in general, including fish farming investment in particular. This finding provides evidence against efficacy of the popular top-down approach in delivery of extension services for fish farming in

contrast to the PAR approach.

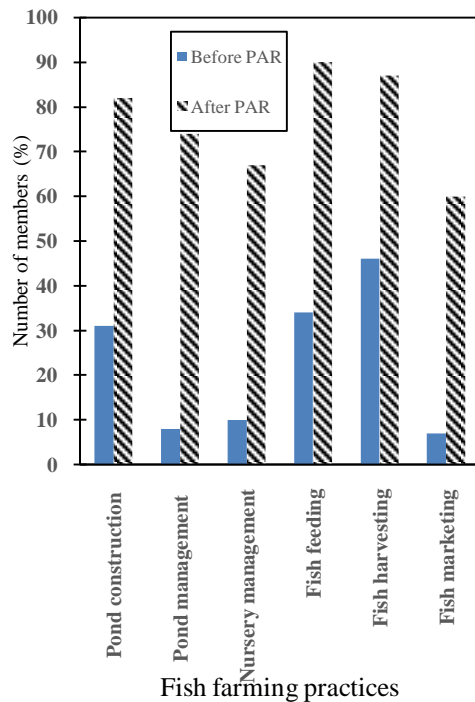


Figure 4. Percentage of members with knowledge in recommended fish farming practices

### Members Level of Knowledge on Recommended Practices for Fish Farming

A knowledge oral test was used among members to determine percentage of what the members knew with regard to the recommended practices for fish farming. As was the case with determining members' level of knowledge on recommended practices for farmer organisations, a Likert scale was used to show results of the oral test. In this case, farmers who got 0-25%, >25-50%, >50-75% and >75-100% in the oral test had lowest level of knowledge, low level of knowledge, high level of knowledge and highest level of knowledge, respectively (Figure 5).

Based on the Likert scale, results showed that there were varied percentages of members on the level of knowledge of what they were supposed to know about the recommended fish farming practices. In addition, results showed significant differences ( $p < 0.05$ ) in the percentage of members who had various knowledge levels during the periods before and after the PAR interventions. Furthermore, the findings showed that a high number of respondents in relation to level of knowledge were skewed to 0-25% knowledge level before the PAR interventions and >75-100% knowledge level after the interventions. This implies that before PAR, most of the farmers knew only 0-25% of what they were supposed to know on effective fish farming. It further reveals that the highest percentage (between 70% and 97%) of respondents knew >75-100% of

the key practices in fish farming after the action research interventions.

The participation of farmers in the participatory action research process in this study demonstrates a more accurate and authentic analysis of social reality that enables farmers to identify alternative solutions relevant to their needs for the improvement of their own livelihoods. Inadequate knowledge that farmers had before the PAR interventions can be said to have affected the capacity of the farmer organisations to promote fish farming, as was noted in significantly low fish production of the groups prior to the CARP Fish Project. Dorward et al. [13] reported that the low level of knowledge among fish farmers in Malawi resulted in poor implementation of fish farming innovations, and consequently hampered the overall development of aquaculture in the country. Anandajayasekaram et al. [14] further reported that the low levels of knowledge among members of the farmer organisations were what negatively affected the application of appropriate practices in agricultural development. This school of thought was equally asserted to by Heemskerk and Wennink [15] with respect to recommended practices in organisational governance.

These findings and assertions emphasise the point that the low level of knowledge among fish farmers in this study on recommended practices had a significantly negative influence on the capacity of farmer groups to promote fish farming in the study areas before the PAR interventions. Conversely, the increased level of knowledge on recommended practices as a result of the participatory action research process had a significantly positive influence on the capacity of the farmer groups to promote fish farming.

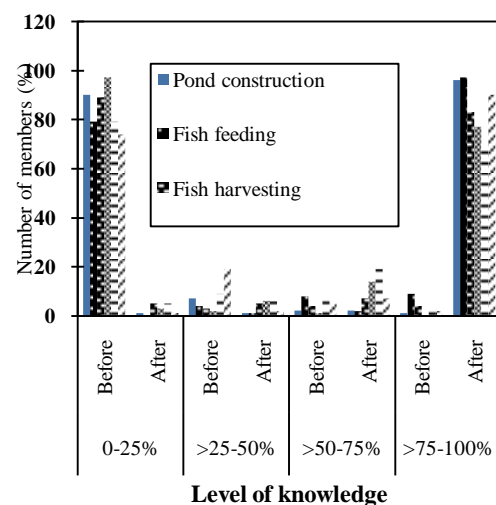


Figure 5. Level of knowledge of members on recommended fish farming practices.

**Farmers Perception on Capacity of Farmer Organisations Before and After PAR**

Assessing perceptions of the farmers was one way of determining the effectiveness of the PAR interventions on capacity of the farmer organisations to promote fish farming. Members were therefore asked to indicate their perceptions on effectiveness of the farmer organisations in promoting fish farming with regard to the periods before and after the PAR interventions. A number of factors such as clarity of the organisational mission and objectives, level of community involvement in planning for fish farming, familiarity with roles of farmer organisations and other organisational attributes were examined (Table 3).

Results showed that there were significant differences ( $p < 0.05$ ) in the number of members with various perceptions on effectiveness of the fish farmer groups between the periods before and after the interventions. Most members had indicated that there was an increase in the existence of the organisational performance variables after implementation of PAR interventions as compared to the period before the interventions. For instance, 91% and about 81% of the members said after the PAR interventions that they were not only more aware of the mission and objectives of the farmer organisations, but also more conversant with their expected roles and responsibilities in their respective organisations. It thus appears that the capacity of the farmer organisations was more effective after the PAR interventions as compared to the period before the interventions.

In contrast though, further analysis showed no significant differences ( $p < 0.05$ ) in respondents' perceptions on effectiveness of organisational leadership and the level of autonomy existing within the farmer organisations. Through focus group discussions and key informant interviews, ordinary members expressed their discontent with leadership of some of the office bearers even after the PAR interventions. The discontent was attributed to the office bearers' lack of openness with their subjects on institutional incentives in their organisations. For example, the ordinary members were not often informed when there was need to send representatives to meetings and training sessions. Thus, despite the PAR interventions, most members perceived that there was no significant

improvement on governance and leadership across the five farmer organisations.

In terms of autonomy, anecdotal discussions with members further indicated that one challenge facing the farmer organisations was that they were solely dependent on external projects in carrying out the fish farming activities. The farmer organisations were highly dependent on external funding organisations for the provision of necessary inputs in order to carry out fish farming. As a result, the farmer groups had not even devised any strategies for sustaining their fish farming activities post external funding as exit strategies. Overall, the results show that most of the members perceived that there was a significant improvement in performance of the farmer organisations after the interventions contrary to the period before the interventions.

This finding agrees with various literature [9,16,17] which suggest that conscientious acknowledgement of the organisational performance variables such as clarity of organisational mission and objectives as well as members' roles within the farmer groups, has an important bearing on effective performance of the farmer organisations. This therefore is an indication that the farmer organisations were more effective after the interventions as compared to the period before the interventions. Similar assertions were reported by NACA [18] and Penrose-Buckle [19].

**CONCLUSION**

The study aimed at determining the efficacy of participatory action research in enhancing the capacity of fish farmer organizations to promote fish farming. The findings have revealed that performance of the fish farmer organisations turned out more effective after the participatory action research interventions as compared to the period before the interventions. Based on the findings from this study, participatory action research approach appears to be relevant for more successful delivery of agricultural extension services. In this regard, training of agricultural extension workers should incorporate participatory action research approaches.

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**Table1.** Challenges affecting performance of fish farmer organisations (n = 68)

Challenges	Fish Farmer Organisations				
	Khum	Nthawi	Phindu	Gwira	Chiko
<b>Institutional challenges</b>	<b>Availability of challenges</b>				
Inadequate knowledge on appropriate recommendations for organisational development	+	+	+	+	+
Inadequate support and encouragement of extension workers	-	+	-	-	+
Inadequate commitment of members in the governance of the farmer organisations	+	+	+	-	-
Inadequate trust among members	+	+	+	-	+
Restriction of spouses	+	+	+	-	+
<b>Technical challenges</b>					
Inadequate knowledge and application of recommended fish farming practices	+	+	+	+	+
Inadequate inputs such as fingerings, tools and equipment	+	+	+	+	+
Inadequate availability of reliable fish markets	+	+	+	+	+
Members' lack of knowledge in marketing and correct pricing of fish	+	+	+	+	+

**Note:** + represents challenge was available; - represents challenge was not available; Khum = Khumbirani; Nthawi = Nthawinchuma; Phindu = Phindulathu; Gwira = Gwirampini; Chiko = Chikondi.

**Table2.** Interventions for solving prioritised challenges affecting the farmer organisations

Prioritised challenges	Suggested interventions (activities)
1. Lack of knowledge and application of appropriate recommendations for organisational development	<ul style="list-style-type: none"> <li>➤ Conduct meetings to sensitise farmers on appropriate recommendation for organisational development.</li> <li>➤ Conduct farmer training in institutional development focusing on leadership skills, group management and record keeping.</li> </ul>
2. Inadequate commitment of members in the governance of farmer organisations and management of fish ponds	<ul style="list-style-type: none"> <li>➤ Conduct meetings to sensitise farmers and office bearers on their roles and responsibilities.</li> <li>➤ Conduct group discussions among farmers to generate ideas on promoting effective governance of the farmer groups and fish farming activities.</li> <li>➤ Conduct training of farmers in institutional development skills and group dynamics.</li> <li>➤ Conduct farmer visits and on-farm demonstrations at their fellow farmers' ponds within their respective areas to learn from one another and share experiences.</li> </ul>
3. Inadequate trust among members	<ul style="list-style-type: none"> <li>➤ Conduct meetings to sensitise farmers on appropriate recommendation for organisational development.</li> <li>➤ Conduct training of farmers in institutional development skills and group dynamics.</li> <li>➤ Design equitable benefit sharing mechanisms among members of the farmer groups.</li> <li>➤ Establishment of study circles among fish farmer organisations which acted as a platform for sharing knowledge among fish farmers.</li> </ul>
4. Inadequate access to extension services	<ul style="list-style-type: none"> <li>➤ Introduction and establishment of lead farmers among the local communities.</li> <li>➤ Recruitment of field assistants to assist in advising farmers in governing their organisations and in implementing recommended fish farming practices.</li> <li>➤ Introduction of sub-committees to carry out various roles in their organisations.</li> </ul>
5. Inadequate knowledge and application of recommended fish farming practices	<ul style="list-style-type: none"> <li>➤ Training of members in recommended fish farming practices.</li> <li>➤ Establishment of study circles among fish farmer organisations which acted as a platform for sharing knowledge among fish farmers.</li> <li>➤ Recruitment of field assistants to assist in advising farmers in governing their organisations and in implementing recommended fish farming practices.</li> </ul>
6. Inadequate inputs such as fingerings, tools and equipment for carrying out	<ul style="list-style-type: none"> <li>➤ Establishment of VSL, introduction of member subscription fees and opening of group bank account to increase farmer income levels for acquiring inputs</li> <li>➤ Linking farmers to microfinance institutions to enable fish farmers get loan</li> </ul>



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fish farming.	facilities.
	➤ Establishment of study circles among fish farmer organisations which acts as a platform for sharing knowledge among fish farmers.

FOs = Farmer organisations; VSL = Village Loans and Savings.

**Table3.** Members' perceptions on capacity of FOs in promoting fish farming (n = 68)

Performance variable	Responses	Farmers' responses	
		Before intervention	After interventions
Clarity of organisational mission and objectives	High	9(13.2)	62(91.1)*
	Low	59(86.8)	6 (8.8)
Clarity of members roles in the FOs	High	11(16.2)	55 (80.9)*
	Low	57(83.8)	13(19.1)
Member participation in the FOs	High	15(22.1)	49 (72.1)
	Low	53(77.9)	19 (27.9)
Existence and awareness of organisational norms	Very familiar	4 (5.9)*	46 (67.6)
	Moderately familiar	24 (35.3)	13(19.1)
	Not familiar	40(58.8)	9 (13.2)
Level of community involvement in planning for fish farming	Full involvement	4 (5.9)*	54 (79.4)
	Partial	35 (51.5)	6 (8.8)
	Not involved	29 (42.6)	8 (11.8)
Effectiveness of leadership in the FOs	Highly effective	5(7.4)	42 (61.8)
	Less effective	22 (32.3)	18 (16.6)
	Not effective	41 (60.3)	8(11.7)
Level of autonomy (self-reliance)	High autonomous	17 (25)	34 (50)
	Less autonomous	18(26.5)	17(25)
	Not autonomous	33 (48.5)	17(25)

**Note:** \* = Significant at  $p < 0.05$ , Numbers in parentheses indicate percentages, FO represents farmer organisations

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