

Using SWOT Analysis to Identify Co-management Schemes that Enhance the Livelihoods of Small-scale Fishers

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This case study was conducted by the resource persons as part of the SEAFDEC Regional Training Course for Trainers on Ecosystem Approach to Fisheries and Extension Methodologies organized at the SEAFDEC Training Department in Samut Prakan from 22 November to 16 December 2011. The training participants served as respondents of the survey which aimed to assess the role of SWOT Analysis in identifying co-management schemes that could enhance the livelihoods of small-scale fishers.

The ASEAN-SEAFDEC Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region towards 2020, which were adopted during the ASEAN-SEAFDEC Conference in June 2011, has paved the way for the attainment of regional agreement for the sustainable development of fisheries. In this connection and as specified in the 2011 Plan of Action, the ASEAN Member States have been encouraged to promote sustainable fisheries management based on ecosystem approach, and to advocate measures that would prevent unauthorized fishing as well as illegal fishing practices by increasing the awareness of fishers on the adverse impacts of IUU fishing, strengthening enforcement of laws and regulations, promoting responsible and selective fishing gears and practices, and promoting alternative means of livelihoods.

Guided by the 2011 Plan of Action, the SEAFDEC Training Department (SEAFDEC/TD) organized the Regional Training Course on Ecosystem Approach to Fisheries and Extension Methodologies from 22 November to 16 December 2011 at its facilities in Samut Prakan, Thailand. Attended by 19 participants from the ASEAN Member States, the Training Course was mainly aimed at strengthening the awareness of the participants on the impacts of illegal fishing on sustainable fisheries and food security in the ASEAN (SEAFDEC/TD, 2011). The specific objectives of the Training Course are shown in **Box 1**.

During the said Training Course, a case study was carried out to promote the use of SWOT analysis in identifying and providing examples of co-management schemes that could enhance the livelihoods of small-scale fishers. Through questionnaires and focus group discussions, relevant data

were collected from the participants attending the Training Course who also served as respondents for the case study which was conducted by the resource persons who lectured on appropriate approaches to fisheries extension including extension concepts and methods, and characteristics of

Box 1. Objectives of the Regional Training Course on Ecosystem Approach to Fisheries and Extension Methodologies

- To enhance the knowledge of the participants on the principles and concepts of responsible fishing, ecologically sustainable development, ecosystem approach to fisheries, precautionary principles, and indicators for sustainable fisheries development and their application in the Southeast Asian region;
- To improve the capacity of participants in the principles, concepts, techniques, and methods in extension, communications, and media production for extension; and
- To strengthen the practical competence of participants in planning and carrying out extension work by focusing on the essential participation of sectors and stakeholders concerned in the ecosystem approach to fisheries management.

Box 2. SWOT and co-management concept defined

- **SWOT Analysis** refers to the analysis model that made use of strengths (S), weaknesses (W), opportunities (O), and threats (T), where strengths and weaknesses are derived from internal factors while opportunities and threats emanate from the external aspects of a situation.
- **Co-management** refers to a cooperative effort where communities, government and external agents share the responsibilities and authorities in the management. Fisheries co-management can therefore be defined as a partnership arrangement where the community of local resource users such as fishers, government officials, other stakeholders such as boat owners, fish traders, boat builders, business people, and external agents such as non-government organizations, academic and research institutions share the responsibilities and authorities for the management of fisheries. Countries in Southeast Asia have their respective ways of carrying out co-management in fisheries taking into account the wide range of factors affecting the implementation and performance of co-management, the status of the resources and fisheries as well as cultural and political factors. In this regard, a change in paradigm in fisheries management had been taking place in the region taking into consideration the different scales of fisheries management from individual fishers to large-scale fisheries. Specifically, in view of the current situation of the region's fishery resources which appear to be in a state of acute degradation, management scheme has moved towards ecosystem management, precautionary principle, and more people-oriented approach while giving more emphasis in good governance, decentralization of fisheries management, and realization of the need for increased resource-users' participation in management.

good extension agencies, and planning and evaluation of extension programs.

One of the main objectives of the lectures was to strengthen the capacity of participants through sharing of knowledge and experiences during focus group discussions, and in determining whether *SWOT Analysis could be implemented to identify co-management schemes for the improvement of livelihoods of small-scale fishers*, taking into consideration the respective work responsibilities of

the respondents. Therefore, the demographic characteristics of the participants in terms of their involvement in extension work, and their perceptions on the concept of co-management were compiled as inputs for the case study. For the SWOT Analysis, the respondents identified and gave examples of co-management schemes which could enhance the livelihoods of small-scale fishers. The detailed features of SWOT Analysis and co-management concept are shown in **Box 2**.

Box 3. Fisheries co-management as practiced in some Southeast Asian countries

Cambodia (Pomeroy, 2012): The country's move towards co-management started in 2000 when the Prime Minister released more than 56 percent of the total "fish lot" concession area of 536,302 ha to the local people. Since then, Cambodia has developed legal instruments in the form of a new fisheries law, a sub-decree on community fisheries, and community fisheries guidelines. Institutional support is made available at the national level (Community Fisheries Development Office (CFDO)), at provincial level (Community Fisheries Development Units (CFDUs)), and local level (Community Fisheries Committees (CFCs)). Two rounds of impact assessment studies had been carried out, the results of which indicated that fishers have greater accessibility to fishing grounds and incomes of local people had increased. The results also exhibited increased awareness of local fishers and reduced conflicts on resource utilization among lot owners and small-scale fishers.

Indonesia: The country has customary fishery laws or practices, and in 1957 licensing had been decentralized. More formal systems of co-management have been implemented since 1997 supported by the Fisheries Law of 31/2004 and the Autonomy Law 32/2004. Management plans are in place with a combination of approaches such as "top-down" which is central to local fisheries agencies and "bottom-up" from local fisheries to the central government. The major objective of the country's co-management scheme is to alleviate poverty by increasing public awareness of fishers without decreasing fishing capacity.

Malaysia: An example of a successful co-management system in inland fisheries is the "tagal" system in Sabah State. As a result of the system's extension in river communities, many river fish populations have been revived during the past few years. State laws empower the river communities to establish regulations for their resources (e.g. Sabah Inland Fisheries and Aquaculture Act 2003). Under the "tagal" system, the local community forms a committee which identifies the appropriate sites, and harvests once or twice per year with the catch equally shared among the committee members. The community liaises with the Department of Fisheries (DOF) Malaysia for technical advice and assistance in setting up a model "tagal" system. DOF Malaysia has been promoting the system, as well as monitors the progress and engages in dialogue with fishers for capacity building and in promoting ecotourism in "tagal" zones where harvesting of fish is not allowed. The responsibilities of the "tagal" committee include deciding on the fees to be charged to eco-tourists, the appropriate closed period, as well as on the amount of fines for violations and promotion of co-management. The communities protect the "tagal" sites through signboards as well through community and peer pressure.

Myanmar: The country promotes the exploitation of its fishery resources in accordance with the estimated maximum sustainable yield (MSY) in both inshore and offshore fishery areas. Offshore fisheries include the use of trawls, purse seines and long lines. The country's aquaculture development has prospered through the years with the current area under cultivation of about 164,000 ha. Production and marketing of eels provides an example of co-management in Myanmar, where the government prescribes the minimum harvest sizes, and organizes the so-called Eel Association. Monitoring of eel production has been a collaborative effort between the government and fishers who have been given the chance to export the fish. The Government of Myanmar recognizes that greater private sector participation in co-management is essential for the sustainable development of the country's fisheries.

Philippines: The country continues to promote the sustainable development of its tuna fisheries in consonance with the provisions stipulated in the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region. Tuna, being the number one export commodity of the country, the Philippine Bureau of Fisheries and Aquatic Resources (BFAR) promulgated Fisheries Administration Order (FAO) No. 224 establishing the Tuna Productivity Project (TPP) in Davao Gulf (in southeastern Mindanao). FAO 224 gives exclusive fishing rights within the project area of 256 km² to the members of a cooperative in the Davao Gulf consisting of small- and medium-scale commercial fishing boat operators in accordance with the TPP management regulations. In the Philippines, the TPP is being referred to as a model in co-management and rights-based fisheries (Daiz and Bañares, 2008).

Thailand: The country's Department of Fisheries (DOF) has implemented various patterns of fisheries co-management or community-based management, by encouraging the adoption of self-regulatory fisheries activities, capacity building and training. Under the country's legal framework, local communities and fishers are allowed to manage their respective territories. The country's local acts and dispensations are supported while the 1947 legislation is being reviewed and updated. The DOF had conducted three community-based resource management projects in Phang Nga Bay, Bang Saphan Bay, and Pathiew District in Chumphon Province. The Bang Saphan project has shown a strong voluntary participation among the stakeholders, reduced conflicts and successfully managed its sustainable revolving fund. The Phang Nga Bay project has also illustrated a good example of central marketing, as well as good research and ecotourism activities. The Pathiew project has set an example for good research, and success in small business development.

Vietnam: An example of the country's co-management system can be found in Tam Giang lagoon with an area of 22,000 ha stretching through five coastal districts, and involving 400,000 inhabitants, with one-third comprising the direct users of the lagoon. A pilot model involves the establishment of fishermen organizations and fisheries management. Results have shown that planning, zoning of fishing grounds, and water traffic control contribute to better environment in the lagoon. A regulation on self-managed fishing grounds was approved in 2003, and serves as pilot model and adopted by 14 self-managed associations practicing self-financing and group-user rights.



Participants in the Regional Training Course who also served as respondents for the case study

Based on the experiences of the respondents, it can be construed that the implementation of fisheries co-management usually varies from country to country since there is no exact blueprint or model for perfect co-management. However, a variety of arrangements always exists that could be used for an appropriate and specific context. Some examples of fisheries co-management schemes adopted in selected Southeast Asian countries are shown in **Box 3**.

Moreover, in the implementation of co-management in some Southeast Asian countries, coordination among local administration, central government and other concerned stakeholders to plan, implement, monitor, evaluate, and take responsibility in the resource management is deemed necessary for the benefit of the present and future generations. With such situation, the resource persons conducted the case study starting with the compilation of the demographic characteristics of the respondents who comprise the nineteen participants from nine countries, *i.e.*: Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Vietnam, in the Regional Training Course on Ecosystem Approach to Fisheries and Extension Methodologies organized by SEAFDEC/TD from 22 November to 16 December 2011. Self-administered questionnaires were used to collect the data pertaining to the demographic backgrounds of the participants, the summarized information of which is shown in **Tables 1-6**, while the participants' perceptions on the meaning of co-management are shown in **Table 7**.

Table 1. Current designated positions of the participants (N = 19)

Title of Positions	Number	Percent
1. Administrative officer	1	5.2
2. Aquaculturist	2	11.0
3. Assistant fishery officer	1	5.2
4. Chief director of marine fisheries	1	5.2
5. Deputy assistant fishery officer	1	5.2
6. Deputy head of administration office	1	5.2
7. Engineering	1	5.2
8. Fisheries biologist	1	5.2
9. Fisheries licensing officer	1	5.2
10. Fisheries officer	1	5.2
11. Lecturer in fisheries academy	1	5.2
12. Researcher	1	5.2
13. Senior fisheries licensing officer	1	5.2
14. Socio-economic scientist	1	5.2
15. Staff of the fisheries resources directorate	1	5.2
16. Technician on livestock and fishery	2	11.0
17. Vice chief of laboratory division	1	5.2

Table 2. Length of participants' work experience in their current designated positions (N = 19)

Relevant working experience (years)	Number	Percent
≤ 10	14	73.7
11-20	3	15.8
> 20	2	10.5

Max = 23 years , Min = 0.5 years , Ave. = 7.3 years

Table 3. Length of participants' work experience in their current office (N = 19)

working duration (years)	Number	Percent
≤ 10	11	58.0
11-20	4	21.0
> 20	4	21.0

Max = 27 years , Min = 2 years , Ave. = 11.2 years

Table 4. Participants' direct involvement with extension work (N = 19)

Direct involvement of participants in extension work	Number	Percent
Yes	15	78.9
No	4	21.1

The positions of the nineteen participants ranged from administrative officers to field practitioners, fishery biologists, and socio-economic scientists. Given such scenario, the participants' perceptions on the concept of

Table 5. Participants' designated position with respect to extension work (N = 19)

Position in extension work*	Number	Percent
Change agent	7	36.8
Group leader	2	10.5
Group member	4	21.0
External expert	3	15.8
Others		
1) Researcher, project leader, consultant	1	5.3
2) Facilitators for fishers	2	10.5
3) Manager of training project	1	5.3

*Multiple responses

Table 6. Types of fisher groups whom participants have been working with (N = 19)

Types of fisher groups*	Number	Percent
Young fishers	5	26.3
Fisher women	8	42.1
Small-scale fishers	13	68.4
Large-scale fishers	4	21.0
Others		
1) Women's group	1	5.3
2) Community-based fisheries management group	1	5.3
3) Fisheries school teacher	1	5.3

*Multiple responses

Table 7. Meaning of co-management as perceived by participants (N = 19)

Meaning of co-management*	Number	Percent
1) Transformation of centralized government management to community management	16	84.2
2) A process of resource management, maturing, adjusting and adapting to the changing conditions over time	8	42.1
3) Changing processes over time in response to changes in both the natural and socio-economic environments	6	31.6
4) Coordination and participation among government agencies, NGOs, external organizations and community groups	3	15.8

*Multiple responses

co-management were derived from the results of the focus group discussions where the respondents were asked to apply the SWOT Analysis in identifying co-management schemes that could improve the livelihoods of small-scale fishers. Descriptive statistics such as frequency, maximum and minimum count, and arithmetic mean were used to summarize the results of the SWOT Analysis as shown in **Table 8.**

Lessons learned from using SWOT Analysis to identify relevant co-management schemes

From the focus group discussions, the participants were able to determine the advantages or strong points of co-management, especially on how to take advantage of the strengths of the communities to address the weaknesses, and to tap the opportunities coming from outside the communities. The demographic characteristics and working experience of the participants exhibited their capability in identifying the aspects of co-management within their work responsibilities. The respondents also came to a conclusion that co-management is the transformation of centralized government management to community management followed by resources, natural and socio-economic management.

Having been involved with extension activities through their roles as either agents of change or group members working with small-scale fishers or other groups in the communities, the respondents recognized that the communities have their own strengths to overcome weaknesses and are able to seek for external assistance from the central governments in the form of training and budget for consultations and meetings. These findings conformed to previous studies that the appropriate extension methods to be adopted should focus on training in order to improve the livelihoods of small-scale fishers (Rangsiapant and Thaipakdee, 2011).

Furthermore, the communities learned to use their strengths such as good cooperation among members, sound fishing grounds and resources, open-mindedness of fishers for new opportunities, and local wisdom, in strengthening their capacity and productivity to confront threats that emanate from outside their communities. These findings were also supported by the experiences of some countries in co-management where emphasis has been placed on the importance of local organizations for effective co-management, economic activities to strengthen the



Government officers and extension workers as agents of change in fishing communities

Table 8. SWOT Analysis of co-management schemes for the improved livelihoods of small-scale fishers

Strengths	Weaknesses	Opportunities	Threats
<ol style="list-style-type: none"> 1. Good cooperation among members of fishery community, e.g. in sharing of benefits from their resources 2. Sound fishing grounds and resources, e.g. high biodiversity (species diversity, spawning grounds, habitats) 3. Open-mindedness of fishers for new opportunities, e.g. members of fishery communities willing to accept state-of-the-art information and knowledge 4. Much experience in the field, e.g. the experiences and traditional knowledge of fishers led to the development of innovative fishing techniques that could be transferred from generation to generation 	<ol style="list-style-type: none"> 1. Insufficient budget and funds, e.g. limited budget for processing fish products 2. Inadequate knowledge/information, e.g. least aware that an open access to fishery resources would lead to overfishing 3. Low technology adopted, e.g. low quality fish products due to low technology used in terms preservation and post-harvest processing 	<ol style="list-style-type: none"> 1. Available government support in terms of training, budget for conduct of consultations and meetings 2. Support from non-government organizations, e.g. NGOs' assistance during consultations 3. High demand for fish and fishery products due to health and cultural reasons 	<ol style="list-style-type: none"> 1. Frequent flooding, especially during rainy season 2. Strong competition for resources, e.g. high number of fishers compete against each other in fishing operations due to low catch per unit effort 3. Water-based and land-based pollution, e.g. improper sewage and land management 4. Extended monsoon season, e.g. limited time for fishing during this season 5. Resource degradation/depletion, continued deforestation leading to resource depletion

established community-based organizations and their financial sustainability, and the need for supporting governmental collaborative mechanisms (Pemeroy, 2012).

Conclusion and Recommendations

Using SWOT analysis, co-management schemes have been identified that could improve the livelihoods of small-scale fishers. This was achieved through the focus group discussions serving as tools in helping the participants capture the essential parts of co-management and get the whole picture of the communities during the analysis. However, in order to complete the study, a follow-up activity should be conducted particularly on the use of local wisdom, management practices, appropriate technology and experiences for community empowerment and readiness to solve the weaknesses and handle threats.

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