

The Promise of Community - Based Fishery Resource Management

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Abstract: Environmental change may pose threats to the ecosystems of natural resources such as the fisheries. It may affect the renewability of the resources which in turn affects the livelihoods of local communities relying on those resources unless managed soundly. To understand how sound management of the fishery resources could be achieved together with the fishermen community, this paper analyses the sensibility of a community-based management of the natural ecosystem as a means to enhance the economic wellbeing of local small-scale fishermen. Two case studies were conducted in Malaysia for this purpose wherein the success factors of the community based fishery resource management projects (the *Komuniti Pengurusan Sumber Perikanan* or KPSP) initiated by the Malaysian Department of Fishery were scrutinised. It was found that the main reason for the projects' success was the existence of an implementation will to redress the triple problems of legal ownership, access to ecosystems and political marginalization of the fishermen. In conclusion, the KPSP model represented approaches worthy of further emulation in the developing world although further research would show the way how the model could be improved and customised according to the unique contexts of other fishermen communities.

Key words: Ecosystem · Co-management. Fishermen · Poverty · Responsible fisheries · Holistic empowerment

INTRODUCTION

Ecosystems are, or can be, the wealth of the poor. For many of the 1.1 billion people living in severe poverty, nature is a daily lifeline. This is especially true for the rural poor, who comprise three-quarters of all poor households worldwide [1]. Harvests from forests, fisheries [2] and farm fields are a primary source of rural income and a fall-back when other sources of employment falter. But programmes to reduce poverty often fail to account for the important link between environment and the livelihoods of poor fishermen [3-4]. This is especially pronounced in developing countries such as Indonesia [5], Brazil [6-7], Chad [8], Bangladesh [9], the West Indies [10], Uganda [11] and the Caribbean [12]. As a consequence, the full potential of ecosystems as a wealth-creating asset for the poor – not just a survival mechanism – has yet to be effectively tapped. This requires that the poor be involved in managing the ecosystems so that they support stable productivity over time and thus form the basis of a sustainable income stream from nature for the poor [13-14].

But for the poor to tap that income, they must be able to reap the benefits of their good stewardship. Unfortunately, the poor are rarely in such a position of power over natural resources [15]. An array of governance failures typically underline the poor fishermen empowerment efforts, among which the most significant include the lack of legal ownership and access to ecosystems, political marginalization and exclusion from the decisions that affect how these ecosystems are managed. Without addressing these defects, there is little chance of using the economic potential of ecosystems to reduce fishermen poverty [16-17].

Malaysia generally exemplifies this array of governance shortcomings. The typical scenario of poverty eradication programmes in rural Malaysia has been that the state adopts a top down approach where the authorities decide and determine what should and could be done and the targeted poor follow and accept what have been determined for them [18]. This includes albeit unwittingly the de-linking of the environment or the ecosystems from the poverty eradication programmes.

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A case in point is the small-scale fishery sector. Here, several social and poverty eradication programmes conducted by state agencies for small-scale fishermen in the country are characterised by insufficient involvement of stakeholders in the fisheries management process. Enforcement of resource exploitation was historically done by government agencies which are normally inadequate and expensive. Insufficient numbers of trained staff for management of capture fisheries leads to inadequate enforcement of the Fisheries Act. Political decisions almost always override technical considerations as very few politicians understand the limitations of a common renewable natural resource such as the fish resource [19].

There is, nevertheless, an exception to this ruling situation. This refers to the inception and implementation of the Fishery Resources Management Community or “*Komuniti Pengurusan Sumber Perikanan*” (KPSP) programme by the Department of Fisheries [19]. This paper analyses the achievement of the KPSP programme as a model of managing the ecosystem to fight fishermen poverty in Malaysia.

MATERIALS AND METHOD

The Study Areas: The main material for the analysis was the model of community based fishery resource management projects (the *Komuniti Pengurusan Sumber Perikanan* or KPSP) initiated by the Malaysian Department of Fishery (DOF). Special reference was given to two successful KPSP schemes located on the island of Langkawi, in northern Peninsular Malaysia.

The KPSP Kuala Triang was the community based approach to resource management where the government through the DOF attempts to empower the community to manage the fragile coastal resource together with the Department. This is in line with the Japanese model of Community Based Fishery Management (CBFM). The KPSP Triang started in August 2003 as a locally based Coastal Resource Management scheme for which the DOF subsequently requested the support of The Southeast Asian Fisheries Development Center (SEAFDEC) which had a trust fund from Japan.

The Southeast Asian Fisheries Development Center (SEAFDEC) is an autonomous intergovernmental body established as a regional treaty organization in 1967 to promote fisheries development in Southeast Asia. Made up of 11 Member Countries, namely Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam; and led by a Council of Directors, composed of

nominees from Member Countries the SEAFDEC aims specifically to develop the fishery potentials in the region through training, research and information services to improve the food supply by rational utilization and development of the fisheries resources. Its services cover the broad areas of fishing gear technology, marine engineering, fishing ground surveys and stock assessment, post-harvest technology as well as development and improvement of aquaculture techniques.

The request for SEAFDEC support was also based on the initial success of the Thai model implemented in the Chumphon Province of Pathew, Southeast Thailand. As of 2009, the project had received a total of RM 98,000 (USD 30,600) in financial assistance for their main activities of cage culture of siakap and *kerapu*, marketing and boat engine workshop. In 2009, the KPSP group had 60 male members, with another 12 fishermen's wives involved in the women's economic group [19].

Also located in Langkawi, KPSP Kilim had 120 members of which 40 have qualified boat driver's certificate to operate tourists' boats. There were still 25 members who remained as fishermen while some others had converted to operating cage culture. As of 2009, the KPSP Kilim had received a total of RM 177,000 (USD 53,600) in financial assistance.

The fishing areas of Kilim were very limited as the border was shared with Thailand whose fishermen were highly active. Fishing had not provided enough returns to the local fishermen due to the already limited fishing grounds and, more recently, to the uncontrolled fishing activities of some 100 Myanmarese who had become Malaysian citizens. The competition had reduced the remaining 25 local fishermen to poverty.

The KPSP Model: As a model of fisheries co-management in Malaysia, the KPSP was proposed at the National Conference on Management of Coastal Fisheries in Malaysia in 2003 by the Department of Fisheries (DOF), Malaysia [17]. It started first in 2001 as Fishermen Economic Groups or *Kumpulan Ekonomi Nelayan* (KEN) in several areas of Peninsular Malaysia. There were currently 65 KPSPs distributed throughout the country.

The basic model of the KPSP consisted of resource management activities such as zoning, crab banks and resource surveillance. In zoning, a special zone was legally gazetted by the government where some of the destructive gears were banned including trawls, push nets, dredges. Aquaculture areas were also zoned for protection. Crab banks were set up in which gravid female crabs were placed in cages to enable them to lay eggs after which the spent females were allowed to be

marketed. Other auxiliary activities of a KPSP might include the release of fingerlings into the public waters; engagement in sea bass cage culture; engagement in swimming crab culture; construction of artificial reefs for resource enhancement and prevention of encroachment of trawlers; mangrove re-forestation; establishment of loan and savings scheme; improvement in the handling, marketing and processing of fish; and creating of job opportunities other than in the fishery sector.

A strong fishermen group was formed to help solve fisheries and other problems, promote resource management and patrol sites from illegal fishing activities. This community group with a strong leadership was imperative for the success of the KPSP. Normally, a women's group was also formed to conduct income generating activities such as processing of fish based local snacks, *batik* painting and craft making. Training in some important aspects of business management was given to the key people involved [19].

Data Collection: In-depth focus interviews with the stakeholders of KPSP Kuala Triang and KPSP Kilim were conducted in mid-2009. The stakeholders comprised executive members of the KPSPs, local officials of the DOF and 20 per cent of the local fishermen population. Aspects of the focus enquiries included initial funding, roles of government and other agencies, technical and professional support in planning, designing and implementing the KPSP model, legal provision and enforcement of protection for the designated fishing areas, quality of the KPSP members, provision of the fishermen's legal ownership rights of the KPSP projects, missions and visions of the local KPSP, economic diversification measures, alternatives in resource management, grassroots awareness, involvement and identification with the KPSP projects.

RESULTS AND DISCUSSION

Achievements of the KPSP Kuala Triang: The KPSP Kuala Triang had shown impressive outputs through active participation of the fishermen and the fishing community. DOF Malaysia through the local Fisheries District Office played the lead role to engage the fishing community in co-management. Besides undertaking the main fishing activities using the drift net and the hook and line, fishermen started small businesses to support the fishing community through the sale of ice and lubrication oil. Several other income generating activities (production of snacks, *Maruku* and *Bilis Sira*), involving the wives of the fishermen were initiated under this

project. Fishery resource conservation and enhancement activities, such as the deployment and maintenance of artificial reefs, were also implemented. A draft fisheries management plan had been prepared for implementation. This was an important step as the plan was to incorporate the provision of the fishermen rights in the community-based co-management [20].

On the resource management aspect, the Kuala Triang KPSP, with the help of DOF and the Maritime Enforcement Agency (APM) had effectively banned trawlers from operating in the waters off Kuala Triang. A liaison officer from the DOF was stationed in Kuala Triang daily from 4.00pm till next morning. This officer collected all reports of encroachments from fishermen and relayed them to the APM base where standby apparatus and personnel of the APM and DOF would be dispatched to apprehend the culprits. News of this effort had discouraged any further encroachments.

The Kuala Triang KPSP had strongly advocated and supported the efforts of the DOF to implement the 'exit plan' for trawlers in the local waters. It had put pressure on the DOF to reduce the number of licenses operating the dredges for exploiting the shellfish (*siput retak seribu*) in the vicinity of Langkawi islands. For Kuala Triang's own fishermen, only two licenses were being operated and no increase was allowed.

No fish purse seiners had been allowed in the in-shore zones as they were deemed to be commercial vessels which will impact negatively on the catches of local fishermen who were mainly small fishermen operating drift nets. The KPSP also discouraged the intrusions of anchovy purse seiners (*pukat jerut bilis*) as they were believed to be catching fish other than just the anchovies.

Substantial artificial reefs had been established in the areas of Kuala Triang, both for resource enhancement as well as prevention of encroaching commercial vessels. The result was that most fishermen had experienced at least a 50% increase in catches since the implementation of this resource management strategy through the KPSP [21].

The KPSP at Kuala Triang also embarked on a crab bank project after the successful Thai Chumphon model. However due to shallow areas of the Triang estuary, cages were not suitable to be built. Instead, the gravid female crabs were marked and released into the waters to enable free breeding. This was indeed a commendable sacrifice on the part of the fishermen to forego the income from the gravid crabs caught for the public good. Most fishermen present in the discussion said they now had much better catches of crabs than before [21].

A repair workshop for fiberglass boats had been established by the fishermen group. There was also a workshop for the repair of engines. The operators had been trained by the DOF. It should be noted that most of the fishermen now owned their fiberglass boats. There were 60 such fiberglass boats in the area. A boat operating a 40hp outboard engine costing about USD 4,250 (USD 3,000 for the hull and USD 1,250 for the engine). For the mackerel drag net (*pukat hanyut tenggiri*) the net may cost USD 6,050. Most fishermen said they took loans either from the Malaysian Fishermen Development Authority (LKIM) or Agro Bank and they reiterated that they had no problem repaying the loans.

Moving forward, a list of new activities was being planned by the KPSP Kuala Triang. These included the culture of cockles the sites for which were being assessed for suitability. In addition, an ice plant was built with the financial help of the DOF. This plant produced 140 small blocks (5-6 kg) of ice to cater to the needs of members. The KPSP also had a shop selling fishing and other equipments for the fishermen community. The 12 members strong of the women's economic group was actively engaged in selling processed fish, dried anchovies, fish crackers, *muruku*, etc. They had also participated in many expositions and tourism related activities to promote and sell their products.

The KPSP Kuala Triang was a very dynamic group led by a very able and committed chairman who also happened to be the chairman of the local Langkawi Area Fishermen Association. This chairman had fully embraced the principle of effective resource management through the shared vision of the community with like-minded fishermen. It was commendable that all members of the KPSP were united in their mission to conserve and protect the resources for the long term sustainability of their industry and the prosperity of the community.

The other enabling factor was the close rapport established with the enforcement agencies. The effectiveness of enforcing the will of the community had discouraged potential encroachers while exclusive allocation of resources for the community had been made possible. The success of the economic activities had reinforced the whole spirit and support of the community. This together with the support of the DOF and the SEAFDEC had guided the planning and implementation of the project. The grass-root awareness and involvement exemplified by this project had been a source of inspiration and a model for other groups of local fishermen communities to emulate [22].

Achievements of the KPSP Kilim: The main factor contributing to the success of this KPSP was its diversification into tourism and into the cage culture industries. Since the engagement in tourism, the fishermen had improved their earnings, in particular, by bringing tourists to the Kilim National Geoforest Park. This park not only had a number of attractions such as eagle feeding, the mangrove forests and interesting geological formations, but also a few floating restaurants which served seafood fresh from cages nearby [21].

In terms of resource management, however, the Kilim KPSP was frustrated by the apparent unwillingness of the Myanmarese fishermen to cooperate with the remaining 25 local fishermen in mounting a joint conservation effort of their resources. Nevertheless the KPSP was still continuing the effort to bring the newcomers together into its resource management programme. The existing lack of cooperation between the local and new fishermen had also hampered the KPSP plan to follow up on the crab bank idea although it was well aware of the crab bank success in Kuala Triang.

In spite of this setback, the Kilim KPSP was able to pursue an alternative mode of resource enhancement, namely, the establishment of artificial reefs. The KPSP had also managed to accomplish other activities. First was drawing up a plan to process fish into fish crackers, including the construction of a fish processing plant with the DOF financing. Second was drawing up a plan for a cattle rearing project. Third, setting up a sewing workshop for the fishermen's wives. Finally, selecting the site of a cockle culture project [21].

It cannot be denied that the Kilim KPSP had been saved by venturing into local geo-tourism [23]. The actual fishing activity had diminished because of the competition between local and immigrant fishermen, such that it was difficult for it to emulate the achievements of the Kuala Triang community. Unless differences between the competing communities were resolved, the only hope for the survival of the Kilim KPSP was for the remaining fishermen to be absorbed into other economic activities whether fisheries related or not.

Perhaps the Kilim KPSP could learn something from the fisheries co-management in some developed countries [24, 25, 26]. The Shiretoko World Natural Heritage area [21] is a case in point. Here, the extension of the fisheries co-management to ecosystem-based management was accomplished by devising a network of monitored organizations from a wide range of communities where large numbers of small-scale fishers took a wide range of species under a fisheries co-management regime.

Table 1: Success factors of the of community based fishery management projects

	Success Factors	KPSP Kuala Triang	KPSP Kilim
1	Initial funding	✓	✓
2	Institutional leadership	✓	✓
3	Technical and professional support	✓	✓
4	Enforcement of areal protection	✓	✓
5	Dynamic organizational leadership	✓	✓
6	Provision of legal ownership rights of project	✓	✓
7	Shared vision and sense of mission	✓	✓
8	Ability to diversify economic activities	✓	✓
9	Creativity in resource management		✓
10	Grassroots awareness and involvement	✓	✓

So in the Kilim KPSP case this could be translated into the existence of two KPSPs, one belonging to the locals and the other the immigrants, networking under the coordination and monitoring of the DOF. This could resolve the apparently irreconcilable differences between the two communities and enable them to move forward with the desired ecosystem-based management of the fishery resources.

Success factors of the KPSPs Triang and Kilim: Ten salient success factors might be summarized from the experiences of the Malaysian KPSP Kuala Triang and KPSP Kilim. These were related to monetary funding albeit from external sources, institutional guidance in articulating the process and functions of the KPSPs in a systematic way with official recognition, technical and professional support for all the scientific and engineering aspects of the KPSP projects, legal provisions for and enforcement of protection of the fishery resource areas by relevant government authorities, dynamic leadership by the KPSP executive committee heads and members, recognition of the ownership rights of the local fishermen communities of the KPSP projects and their right to gain the benefits of the KPSP, a profound sense of mission and vision shared by all the KPSP executive and ordinary members, the ability of the KPSP members to diversify the economic base of the KPSPs, the capacity of the KPSP members to create activities to generate alternative ways or managing the fishery resources and the overall awareness and involvement of the entire local fishing community (Table 1).

CONCLUSION

The Malaysian community fishery resources management cases were successful because they had put the poor fishermen on the right path to fight poverty. By recognising the fishermen's resource management

knowledge and ability and granting them the responsible stewardship of the natural resources through the KPSP the fishermen now had better control of their survival resources. In these projects there was the implementation will to confront and resolve the typical problems of the poor's legal ownership and access to ecosystems, political marginalisation and exclusion from the very decision making process that affect how these ecosystems were to be managed on their behalf. The KPSPs thus represented approaches worthy of further emulation in the developing world although further research would show the way how the model could be improved and customised according to the unique contexts of other fishermen communities.

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