ECONOMIC CONCEPT OF COMMUNITY-BASED MANAGEMENT FOR COASTAL FISHERIES

by

Ruangrai Tokrisna
Department of Agricultural and Resource Economic
Faculty of Economics, Kasetsart University
Bangkok, Thailand

ABSTRACT

Open-access fishery has led to problems of overfishing and dissipation of resource rent. Among fishery biologist maximum sustainable yields are preferred. To economists, the optimal level of fishing is at maximum economic yield where resource rent and consumer surplus are maximized. Nevertheless, conventional management schemes by central authority are inefficient among tropic coastal state countries with multi-species, multi-gear fisheries, Community-based fisheries management (CBFM) is then in an option for a a better cost effective management schemes Resource rent can be maximized while resources will be more abundant but at the cost of decreasing consumer surplus. There is a plausible "underfishing" in adopting CBFM, Supportive institutional framework, strong local organization, exclusivity of fishing against outsiders, sedentary/inshore fisheries, and recognition on fisherman social status are positive factors advocating the adoption of CBFM while the negative factors are the opposite, plus heterogeneity of fishermen and problems of equity in access to fishing. Economics of CBFM is actually the distribution of control power due to market failure. There are external elements given to the local fishermen who can only control their internal decisions. The optimum is obtained where marginal benefit of CBFM equals marginal cost. Factors to be considered are transaction costs, including exclusivity and governance costs. In adopting CBFM maximizing resource rent must be combined with minimizing transaction costs for an optimum fishing level.

1. Justification for Community-based Management in Coastal Fisheries

Without an appropriate management scheme, rapid development in the fishing industry can lead to problems of overfishing and finally a degradation in fishery resources. In open-access fishery, fishermen continue fishing as long as the return from fishing can cover the cost. There is no guarantee that if they do not fish today, they can catch tomorrow. Profit maximization where marginal revenue equals marginal cost does not take place in open-acces fishery. Instead, equilibrium will be reached where the total revenue equals total revenue (i.e. average revenue equals average cost). Resource rent is dissipated as all those returns from fishing are to be paid out in costs of fishing, this does not take into account the cost of the fish

themselves. The society as a whole loses what they should gain from such resource exploitation. At the same time fish abundance is degraded. There will be less fish available for future generations.

Among fishery biologists, maximum sustainable yield may be preferred as the volume of catch is maximized while fish abundance is maintained at its maximum growth rate. Fishery economists favor maximum economic yield where society gets the most from those catches. At maximum economic yield where the return per unit of catch equals its marginal cost, social benefits including resource rent (accrues to the fishing sector) and consumer surplus (accrues to the consumers) are at their optimum.

Various attempts have been carried out in order to manage fishery such that we can optimize exploitation of fishery resources. Often found conventional fishery regulations involve both renewing resource abundance (including closed season, closed area, and gear restriction) and control on fishing effort (including limited licenses, quotas and taxation). In Southeast Asia, long coastlines and scattered landing points make effective fisheries management difficult. There being multi-species, multi-gear fisheries increases the complexity in fisheries management planning. Effective monitoring and enforcement costs are high. Government may not be able to afford such costs. Community-based management of coastal fisheries is proposed as an alternative for a better management scheme. Limited government success in effective fisheries management makes way for community-based management in the expectation of improving efficiency, equity, and cost effectiveness of fisheries management. Nevertheless there are certain costs involved in implementing commmunity-based management in coastal fisheries.

Implementing community-based management in coastal fisheries can be considered an approach to rectify the problems of common property as fishery resource exploitation can be controlled by the fishing community. Property rights on fishery resources is defined at a level. Empowering such management schemes increases recognition of resource value and thus a more careful exploitation. Nevertheless, granting rights over fishing to the fishing community can lead to underfishing equilibrium where the marginal cost of catch equals marginal revenue. The fishermen, with rights over fishery resources, want to maximize fishing profit. In such cases, fishery resources will not be optimally exploited. Catch will be lower than the optimum level while fish stock abundance will be higher. Consumers have to pay a higher price at this lower landing volume while resource rent, accrues to the fishermen as their fishing profit, is at a maximum. Community-based fishery management in fishing villages leads to a greater benefit for local fishermen at the cost of present consumers. Nevertheless, the decrease in today's catch implies that fish stocks can be maintained at a higher level. There will be more resources for the future.

2. Limitation on Community-based Fisheries Management

Inefficiency in central fisheries management among coastal states in developing countries has led to the development of community-based fisheries management (CBFM). CBFM has been thought of as an effective management scheme due to the success in Japanese coastal fisheries management. Nevertheless, there are at least two possible weak points of adopting community-based management schemes which should be considered a priority. First, there were certain costs involved. Second, implementing CBFM can take a long time.

In some cases costs of CBFM can be higher than conventional management schemes. Without an appropriate supporting institutional framework, the success of CBFM can be questionable. Where the local institutional framework is weak, additional investment is needed to strengthen and build up community management capacity. Without strong local organization, it can take a long time to develop local capability and participation in fishery resource management. The longer the time, the worse the resource condition is. There are costs in implementing CBFM. The benefits are fishery resource abundance. Cost-effectiveness of CBFM should be evaluated as a priority of implementation. Given the right institutional framework, if local community can benefit from CBFM, it is likely that they will get involved efficiently and effectively.

By characters, high exclusion cost is one of the most important factors limiting the chance of success in adopting CBFM. In the case of Japanese coastal fisheries, the success can be explained partly by their sedentary species inshore fishery in a confined area. Granting fishing rights to fishing communities where local fishermen are not able to exclude outsiders from fishing in their fishing ground, can be a failure. The management will be more difficult for those highly migratory species. Fishing rights over migratory species on the basis of CBFM can be a locational advantage but cannot be exclusive to fishery resources.

In fishing communities where fishermen are heterogeneous in their fishing skill, cost of internal governance can be high. Fishermen with superior skill earn rent from fishing and are inclined to oppose any regulation as their rent will be cut unless fishery resources are depleted. Once conservation measures have been agreed, these better-off fishermen are the first who can reap benefit from the renewed resource abundance, while the marginal fishermen may not be better off. Moreover, if introduced in communities with varieties of fishing patterns there can be conflicts of interest, thus it is difficult to get an agreement upon management planning.

Equity is another obstruction in implementing CBFM. Granting fishing rights to a specific community may not be acceptable, at least politically. Government may be reluctant in advocating CBFM in the question of equity and access to fishery resources.

In the case of Japan, fishing rights were granted to coastal fishing communities in order to reduce the conflicts among fishermen from different communities, while there was strong local traditions and kinship among fishermen in the same community. Government support (especially on demarcated fishing rights and large scale set-net fishing right schemes) enhanced the success. Recognition of fisherman social status is another factor of success for CBFM in Japan. The conditions may not be the same in the other countries.

3. Economics of Community-based Fisheries Management

Market failure due to fish being common property resources and unsuccessful conventional fishery management by central authority make way for CBFM. We can look at this issue as an attempt to introduce the issue of the distribution of control power. Economics is fundamentally, distribution of power through market functioning. When control structure works perfectly, the market functions. In case of common-property fishery resources, the market fails. Lack of control induces costly races in fishing and depletion of resources. High costs of monitoring and enforcement constrain effective central management. Control structure has to be corrected. CBFM, granting fishing rights thus the control to the community, is recommended as an option.

Institutional environments such as laws and regulations, social norms and customs are given to the community. These are external elements which are out of the community's control. If institutional environments are CBFM friendly, success is more likely. Communities can make decisions on fishery resource utilization and conservation such that control will be exerted until marginal cost of control equals marginal benefit.

In the aforementioned, adopting CBFM can be costly if there is a high cost of exclusion. There are "transaction costs" in adopting CBFM. Transaction costs are defined as the costs that arise when a community exercises ownership rights to resources and enforces their exclusive right. They consist of the cost of arranging an agreement ex ante and monitoring and enforcing ex post. CBFM transaction costs depend on measurability of fishery resources. Recognition and awareness of fishery resource values lowers the transaction costs of CBFM. Another factor determining transaction costs is the nature of transactions. If transactions are voluntary, durable, and simultaneous; CBFM transaction costs can be lowered. Lastly, non-exclusivity and high governance costs discourages willingness of those local fishermen to participate in CBFM schemes. Improving quality of fishery resources will be difficult without active participation among fishermen. Transaction costs are high in such cases.

Maximizing the net benefit from CBFM involves both maximizing resource rent from sustainable stock as well as minimizing transaction costs of the controlled fisheries. Whether it is worthwhile to adopt CBFM depends on costs and returns from fishing and transaction costs of which exclusivity and governance play a key .role. CBFM can be a solution if the net benefit from this management scheme can be

maximized. It is likely that providing an appropriate external environment, where prevention on encroachment by the outsiders is possible and governance costs are relatively low, it is likely that CBFM is recommendable.

Exclusivity and governance costs depend on several factors including natural barriers to entry by outsiders, physical characteristics of fishery resources (being sedentary or migratory), fishing patterns (multi-species, multi-gear, seasonal, fishing gear conflict, inshore or offshore), state of technology (traditional or modern), political support (in favor of uplifting the coastal fisherman livelihood or equity of access to fishing,), laws and regulations, social organization (strong or weak local group: interest, willingness and capacity of the local fishermen in participation on CBFM scheme), norms and customs, and relative prices and value judgment on fishery resources. These factors should be considered before attempting the adoption of CBFM.

Investigation of the economics of CBFM, examining the organization of the control structure including various contractual arrangements and economic activities and economic results (success and failures and development of coastal fisheries), provides basic guidelines in adopting a successful CBFM.

4. Key Factors for Community-based Fisheries Management

CBFM can work effectively in coastal fisheries where fishery resources, being the mainstay of the coastal community, are being depleted. Being the only source of income, local fishermen recognize the value of fishery resources and are willing to participate in the renewal of, and sustaining their resource abundance. Fishing boundaries should be identifiable such that the problem of exclusivity can be minimized. Fishermen should be equipped with the capacity of effective management at the outset.

Once CBFM is selected, community participation should be strengthened and built up to adopt their management plan. Government agencies should provide support on community empowerment (including supporting frameworks, laws and regulations, finance, and education). Local fishermen are stakeholders and must be effectively involved in decision making. Management plans should be decided by the local fishermen and worked from bottom-up not top-down. Actions and changes that take place must be agreed at community level. Effective involvement of local fishermen can be increased if the benefits to be received from CBFM can be visible, quick and proportionate to their contributions.

Key factors for successful development of CBFM are as follows.

1. Encouraging participation of local fishermen via participation among relevant agencies in preparation for CBFM, consultation, pilot activities, and structured learning.

2. Emphasis on the collaboration at the community level via recognition on the need and interest of the locality, assurance of net benefits to the locality from their involvement in CBFM, embedding socially strong and active local organizations, building up community capacity (including leadership, knowledge and skill for effective fishery resource management), support on community's regulations and enforcement.

3. Adoption of appropriate technology that suits the community needs.

4. Effective outreach programs with two different approaches, empowerment and extension. The empowerment approach is essential. While the extension approach focuses on increasing efficiency in production (fishing as well as others), the empowerment approach focuses on effective involvement of the locals.

In adopting CBFM, the following checkpoints should be considered.

- Benefits and beneficiaries from CBFM.
- Needs and capacity of the community.
- Needed changes, in the physical sense and capacity, at the community level.
- Key persons and community levels and their roles.
- Roles of supportive agencies, both government and non- government.
- Appropriate outreach programs, empowerment and extension.
- Investment in building up the community capacity for effective management.

5. Conclusion

Given the right community capacity, CBFM can be an answer, giving an effective fisheries management in tropical multi-gear multi-species fisheries. Nevertheless there are certain costs involved in the adoption of CBFM. CBFM should be selective and may not be applicable on a large-scale basis. Careful design for certain success at the initial stage of development can induce more success from this management scheme.

6. References

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