An Appraisal of Community Based Fishery Management for Sustainable Development of Marine Fishermen: A Case Study in Orissa

Purushottam Sahu[1] and N. B. Pradhan[2]

Abstract *: Marine fisheries is the world currently face the problem of resource depletion. This is largely due to over fishing. Crude symptoms of over fishing include on increasing proportion of trash fish landing, complete disappearance of certain commercial species and shrinking sizes of fish catch (Lan and Pathansati, 1977, Ibrahim, 1987). The sustainability of the marine fishery resources depends on two things the damage the fisherman does and the effort devoted to restrict that damage. If fishermen are unwilling to restrict their individual fishing effort, the fishery resources will eventually decline. However, if a fraction of the fishing population is willing to restrict the fishing effort, the problem of over fishing will still occur. This is because of the individual action to reduce fishing effort is very less in relation to the over all reduction that is needed for the sustainability of fishery resources. Chong (1996). Hence a collective action by all fishermen in the community is needed to overcome the problem of over fishing and encroachment of fishing areas by the outside mechanized trawlers. The approach of Community Based Fisheries Management (CBFM) is thought to be relevant in achieving sustainable marine fisheries development.*

The Community Based Fishery Management (CBFM) approach is designed to encourage stakeholder's participation in managing the fisheries, in co-operation with government. The government will function as a facilitator in bridging any gaps that the stakeholders fail to resolve. The essence of CBFM is to promote smart partnerships between all parties concerned with fisheries management. This will lead to greater co-operation between stakeholders, strengthen management efficiency, and reduce the government's burden in managing the fisheries, because the cost of management will be shared with other stakeholders.

The basic objective of this paper is to examine the suitability of implementation of community based fishery management for sustainable marine fisheries development and management. This paper has also made an attempt to evaluate the efficacy of collective and community actions to prevent the encroachment of outside trawlers in the prohibited areas of traditional fishing and to check the shrimp seed collection and the catch of Gravid prawn in the Ganjam coast which causes the resource depletion.

The database and methodology of this paper is based on the primary and the secondary sources. The secondary source of information and literature are used to analyse the experience of CBFM implementation in South East Asian countries and to analyse the fishery policy of the Government of Orissa. The primary data and information collected through the participatory rural appraisal in Ganjam district from time to time during the study period by the researchers are used to examine the concerns of marine fishermen regarding resource conservation and management.

The experiences, of community participation and collective action made by the marine fishermen in collaboration with "The Kalinga Traditional Marine Fishermen Association" in Ganjam district of Orissa have analysed the case studies in this paper. The results of these case studies show a positive way for successful implementation of CBFM for sustainable development and management of Marine fisheries in Orissa.

[1] Lecturer in Economics, Gopalpur College, Gopalpur-on-sea, Ganjam, Orissa

[2] Professor, Department of Economics, Berhampur University, Orissa.

Introduction

Biodiversity has a direct linkage with the stability of ecosystem. Human interference has disturbed most of the ecosystem. Irrational and over exploitation of natural resources has crossed the sustainable levels and even lead to extinction of a number of species, Gorden (1954). Thus the conservation and management of coastal resources become one of the major global environment concerns after the International Convention on Biodiversity Conservation held at Rio in December, 1992.

India is endowed with a long coastline of 8041 km., 0.5 million sq. km. of Exclusive Economic Zone (EEZ) and a catchable annual marine fishing potential of 3.9 million tonnes. The Indian marine fisheries sector plays a very important role in supplying protein rich food to the increasing population, employment generation and foreign exchange earnings. India occupies the sixth position in world marine fish production and is one of the leading nations in the marine fish export.

Orissa has coastline of 480 km with a continental shelf of 24,000 sq. km. constituting an annual field potential of 1,256 lakh tonnes of fish per year. About two lakhs of marine fishermen depend on marine fishing for their livelihood in the six coastal districts of the state. The exploitation of marine resources is mostly done on private basis and there is a conflict between short term preferences of fishermen and long term danger of depletion of marine fishery resources in Orissa.

The fishery resource is a common property resource. It has two distinctive attributes; its benefits are non-excludable and rivalries (Cornes and Sandler, 1986). “Non-excludability” implies that it is difficult to exclude potential users or new comers from tapping it. This is particularly true of fishery resources, preventing some one from fishing is difficult when the area is vast and coastline is long. When the benefits can be obtained for free, it is natural for some one to refuse to conserve these common resources.

From the individual fishermen’s viewpoint, fish that he does not catch will eventually be harvested by someone else. Hence, it is logical for him to catch as much fish as possible and maximize his profit rather than being a sucker (Kamaruzama, 1997). If all fishermen think on the same lines, the total fishing effort will grow and exceed the Maximum Sustainable Yield (MSY) threshold. Thus, the fishery resource will be eventually depleted. Hence the challenge for fisheries managers is to motivate individual fishermen to protect their jointly owned fishery resources. However, the benefits of fishery resources are “rivalrous” in the sense that the catch by one fisherman will reduce the quantity of fish available to others at that particular time. Fish resources are limited and renewable and subject to over fishing. This problem may occur when the exploitation rate substantially exceeds the rate of biological replenishment. Whenever fishing occurs, the catch rate will decline but the cost of fishing will increase. Hence, to increase or to maintain fishing productivity and profitability, all fishermen must work collectively and refrain from over using of these resources.

The fishermen’s influence on the quality of fishery resources depends on two things, the damage he does and the effort devoted to restricting that damage. If fishermen are unwilling to restrict their individual fishing effort, fishery resources will eventually be destroyed. However, if only a fraction of the fishing population is willing to restrict the fishing effort, the problem of over fishing will still occur. This is because the individual action to reduce fishing effort is miniscule in relation to the overall reduction that is needed to secure healthy resources. Hence, a collective action by all fishermen is needed to over come the problem of over fishing. The approach of Community Based Fisheries Management (CBFM) is sought to be relevant in achieving sustainable fisheries development.

CBFM may be viewed as a process by which fishers are given an opportunity and responsibility to manage there own resources, define their needs, goals and aspirations and take decisions affecting their well-being. The potential advantages of CBFM include effectiveness and equity. CBFM can be more economical from the standpoint of administration and enforcement than the national centralized system. CBFM involves self-management; the community takes over responsibility for monitoring and enforcement. CBFM gives a feeling of ownership over the

resources, which makes the community more responsible for long-term sustainability of resources.

Pre-Requisites for CBFM

CBFM is designed to manage both the fishery resources and the fishermen. This is because there is a direct relationship between the resource condition and what the fishermen do. Hence to manage the fishermen effectively, Clowson, (1972), pointed out, as people are to be managed or at least influenced in their direct use of natural resources, the resource managers will have to know much more about people, their motivation, their sensitivities and their response to various stimuli. Several Pre-requisites must be fulfilled to implement community-based fisheries management. These are:

1. It requires a clear, defined fishery boundary. Without a clear defined, boundary people do not know to what extent the fishery is to be managed and for whom. The boundary can be in the form of (a) Defined location or area. (b) Type and number of stakeholders and (c) Type of fisheries and fisheries resources to be managed.

   Under the present Fisheries Act, and Licensing System, nobody is allowed to fish without a valid fishing license. There are several conditions attached to the fishing license. One of the conditions relates to the fishing area. Fishermen from one district or State or a locality are allowed to fish only in their respective zone in the territorial waters of that particular locality, district, or State. Fishermen from other districts or States are prohibited from fishing in this area. This condition gives a certain group of people the ownership title to a fishing area. As a result, the members of the group and organisation can expect that the benefits of protecting their fishing area will accrue to them, hence it promotes sustainable collective action among members. However, the existing boundary is rather limited. It can be broadened to cover other stakeholders.

2. It must have an effective local institutional set up. This institutional set-up is required to promote greater participation among various stakeholders. This body or organisation can be local or governmental sponsored association, but it must be able to promote, co-ordinate and harmonize its member's perceptions and goals. In order to achieve this objective, it requires an influential and effective leader with clear vision, backed by grassroot co-operation and support.

3. It requires an effective information gathering mechanism. Fisheries managers requires full and complete information in order to manage the fishery on a sustainable basis. The necessary information, however, is usually in the form of bits and pieces. An effective mechanism is needed to collect all necessary information, especially data. Furthermore, this mechanism must be able to disseminate information to stakeholders so that all stakeholders have access to obtain the same information. This will enhance co-operation among the stakeholders and promote a smart partnership.

4. It requires some form of control mechanism to reward or punish.

   A control mechanism is needed to ensure a long lasting partnership between all stakeholders in the fishery. Without an effective reward and punishment mechanism, it is expected that some members in the group or organisation will try to maximise private benefits and may jeoparadise community activities. A reward and punishment mechanism will prevent or minimise the probability of "individualistic" activities, and promote collective action by the members.

The Community-Based Fisheries Management Plan.

CBFM is implemented in phases or stages as

1. The Promotional Stage

This stage focuses on information gathering about CBFM. The strengths and weakness of CBFM are analysed, and the current management practices of CBFM are identified. The information is then disseminated to relevant

government officials, especially the fisheries officials at all levels. Forums and seminars are to be conducted for understanding of CBFM among stakeholders and their individual role in implementation of the CBFM.

2. The Implementation Stages

During the implementation stages, several activities have to be carried out. First, the government has to identify the development programmes that could promote collective activities by all or a majority of the stakeholders. This is important, because the success in CBFM depends on getting the stakeholders to work together, thus creating a sense of co-ownership to that programme or project.

In order to implement a particular development project, the government needs to identify the potential recipients as well as their locations. The second step of implementation is vital in order to ensure the success of the project. Without identifying the site and recipient, it is difficult to organise collective or community work. This is because who works with whom will determine to whom the project will benefit. It is desirable that the site and the type of fishery to be selected have some similar features so that all stakeholders will co-operate and arrive at a common decision.

The next step is to encourage and convince target groups to participate collectively in CBFM project. The cost of the project could be shared by the fishermen. To ensure smooth implementation, the government officials should act as facilitators and co-ordinate the implementation of this project. The government should provide some financial assistance to the projects, and to monitor and supervise activities closely from the standpoint of national interest. At the same time the government will take necessary measures especially legal measures, to confirm to the need of CBFM

CBFM: Some Experiences In South East Asian Countries:

The trend in many parts of the world and more particularly in South East Asian Countries during the last three decades has been to increase the role of national government in management of coastal fisheries. The role of local level control, through traditional and informal management and control, has correspondingly diminished. The national government has often under estimated the capacities and experiences and knowledge-based traditional and informal management systems. Recent developments on coastal fisheries management around the world and in the South East Asian region have shown that when left to their own devices, communities of fishers, under certain conditions, can regulate access and enforce rules through community institutions and social practices to use fisheries resources sustainability. Community-based resource management has re-emerged as a way to involve resource users and to utilize indigenous institutional arrangements and knowledge in fisheries management.

Several countries in Southeast Asia are now recognising the important potential role that community-based management and co-management systems can play in contemporary fisheries management. Each country is taking a different approach to the implementation of these systems. Some experiences of this approach being taken in countries like Malaysia Thailand, Indonesia, Vietnam, Philippines, Sri Lanka, Japan, and India are discussed in this paper.

Malaysia

The political and legal framework in Malaysia strongly favour central control of fisheries management. However, some form of co-operation or sharing of responsibilities between stakeholders of fisheries already prevails in some localities. For example, Smart partnership relationship has existed between fisheries stakeholders in Kukup, a small fishing village in Johor, for more than a decade. The various stakeholders basically agreed among themselves to compartmentalise their limited available fishing area. Fish farmers are allowed to keep their floating cages in the Kukup strait. Beg net fishermen continue to fish in their traditional fishing area between the northern Kukup straits and Sungai Penerok, while trawlers and other fishermen are required to fish in other agreed areas as stipulated in the fishing license, on the basis of their mutual agreements. The government only needs to enforce them. It is found that all stakeholders live in harmony and work closely with one another. All parties have a strong

interest to guard and protect the common fishing grounds, especially from the intrusion of trawlers from other areas.

It is found that fishing conflicts on fishing grounds in this area are minimal. If any conflict arises, the stakeholders would resolve the conflicts by themselves through negotiations. As a result, enforcement activity required to manage this fishery is minimal. This is because all stakeholders have arrived at a common understanding to protect and preserve the common fishing area for their sustainable use of resources.

Under the Malaysian Fishery Management Policy, four fishing zones were established through a limited licensing scheme where by rights and rules in each zone were designated for specific fishing methods, classes of vessels, species caught and ownership patterns. Although the policy has made progress towards meeting its stated objectives of achieving optimum yield, eliminating conflict between small scale and commercial fishers, and a more equitable distribution of catches, enforcement problems still exists. While the political system in Malaysia does not fully support the possibility of decentralization of management, an alternative monitoring, control and surveillance (MCS) system has been proposed for sharing of responsibility with the community. Under the proposed MCS system, the community (fishers organisations and NGOs) would have increased responsibility for monitoring and management and the federal government would maintain responsibility for control and enforcement SEAFDEC (1997).

Thailand

The community-based system in Phang-Nga-Bay, Thailand, supported by BOBP, is an excellent example. Representatives from some 110 fishing villages of the Bay hold regular monthly meetings to initiate discuss and monitor management activities. These are implemented by Andaman Sea Fisheries, Department Centre of the Department of Fisheries with community co-operation and BOBP support.

Some management activities introduced so far use of trawls and motorized push nets has been banned within 3 km. of the coastline. A fleet of patrol boats monitors' compliance, Second, fisher folk voluntarily gave up resource damaging push nets in return for gill nets made available by the government. The push nets voluntarily given up in exchange for gill nets were burnt. Third, community spawning cages, cage culture of fish, oyster and mussel culture and open water stocking of finfish and shellfish seeds are being promoted to enhance fish stocks and widen income options. Other activities includes installation of artificial reefs to keep out trawlers and concentrate fish around the reefs, mangrove reforestation, sea ranching, installation of rubbish bins, etc, setting up a multi-purpose community learning center, empowerment of fisher folk as volunteer-rangers to monitor fin fish activities, training, sports events etc. (Chong-1999). This project is a triumph of people's participation. Its impact on resources, on government fisher folk relationship and on fisher folk morale, has been outstanding. CBFM in Phang-Nga-Bay, the earnest expression on the fisher folk and government officials reflected the commitment that each one shoulded to plotting a new course towards the sustainable management of Phang-Nga Bay's coastal resources, BOBP (1996).

Indonesia

Indonesia has more than 17, 500 islands and an 81,000 kms coastline strading the Pacific Ocean and the Indian Ocean; it covers 3.1 million sq. km of territorial sea and 2.7 million sq. kms of Exclusive Economic Zone. But it allocates an average of just about 3 percent of the five-year budget of the Directorate General of Fisheries. For fisheries management, Community-based management systems have a long history in Indonesia and are the most long enduring in the region. These systems are by and large localised practices found in geographical pockets through out the country. The traditional fishing rights and community-based management systems are based on 'restriction', which closely parallels the modern management concepts of closed areas and seasons.

Current national laws in Indonesia do not recognise local community-based resource management systems in coastal fisheries. Fisheries administration and governance is centralized. Indonesia's long-term development plan was completed in 1993 policy and strategy in the form of the State's main guidelines for the first five-year development (1993-98) was laid down the People's Consultative Council. In 1994 a new programme of poverty

alleviation, called Impress Desa Tertinggal, (IDT) was initiated. This programme aims to promote economic growth in fishing and farming villages through decentralization and active participations of the local community. The programme objectives stress a reformulation of the basic approaches to fisheries and agricultural development, from a production approach to one of enhancing fisher and farmer income and welfare. This will lead to more sustainable resource management.

Vietnam

Historically, fishers in Vietnam established associations called Van, to preserve village or community social structures and to provide mutual assistance related to the fishing activity. This association, headed by a elected fisher, performed several functions including conflict resolution, establishment of the rules to manage fishing activities. Like other organizations in Vietnam, the Van was banned in 1980's. It is now slowly re-emerging in fishing communities throughout the country. In the recent developments in political and economic reforms in Vietnam, the government has currently introduced new policies for the fisheries sector. There is recognition that coastal or near shore fisheries are over exploited due to the high levels of fishing activities, destructive fishing practices, and lack of enforcement which occurs in these waters. The new policies will constrain fishing activities in near shore waters emphasizing aqua culture as an alternative to near shore fishing and encourages offshore fishing. The Ministry of Fisheries, at the central level, will have overall responsibility for formulation of policies planning and regulation for the fishery sector, registration of large vessels and foreign fishing activities. Provincial fisheries departments will have responsibility related to capture and culture fisheries development and management within their jurisdiction. The ministry of fisheries has endorsed fisheries co-management as a strategy for managing near shore and estuarine areas. Recently Ministry has under taken a programme to delegate resource management functions to local institutions, including fishers' organizations. This programme will have to develop models and gain practical experiences in co-management. These lessons learned from these pilot sites will be integrated into national policies and laws to support co-management.

Philippines

The Philippines has a long history of traditional fisheries rights and allocation. However, under both the Spanish and American colonization of the country, community authority and rights were superseded by the municipal government control of local fishing grounds. This administrative structure of municipal authority remains in place today, (Pomeroy, 1994). In 1991, the government recognized the need to increase participation in management and to develop control over resources access to local levels through policy and institutional reforms. Among these the decentralization of the management of near shore fisheries to municipalities and local fishing communities under local Government Code of 1991. The government now actively promotes community based resource management to conserve the coastal resources and diversify the income sources of the low-income small-scale fishers under the Fisheries Sector Programme of the Department of Agriculture, Philippines.

The legislative branch of Philippines government has also made substantial contributions towards co-management. Since 1988, six bills and one resolution dealing with fisheries management have been passed to protect the declining state of the fisheries sector by providing guidelines for a balanced ecological and economic use of the resources. Fisheries community-based management and fisheries rights are included among the provisions of the fisheries code. It aims at establishing Resource Management Council (RMC) for each coastal municipality. RMCs shall be composed mainly of representative fishers together with other concerned sectors in the coastal community.

Sri Lanka

Sri Lanka has a long coastline of 1800 kms along with sandy beaches, extensive lagoons, and estuaries. It comprises a territorial sea extending up to 12-24 nautical miles and Exclusive Economic Zone extending up to 200 miles, covering an area of approximately 230 thousand sq. km. There are nine provinces embracing 24 districts. Although fisheries account for only 2 percent of Sri Lanka's GDP, the sector is very important in terms of

employment, food supply and foreign exchange earnings. Fisheries in Sri Lanka are basically small scale. The objectives of fisheries development and management are outlined in the National Fisheries Development Plan – 1990-94.

Over the years, fish production has increased, especially that of the coastal fishery. In the open access coastal fisheries, excessive fishing effort was applied, there by depleting resources and lowering incomes for small-scale fishermen. Under these circumstances, fisheries management is an immediate requirement. In this process of management the participation of the resource users is essential for successful implementation. Fishermen have formed various community organisations in Sri Lanka. One of the oldest is the co-operative movement, which was introduced to Sri Lanka in 1911. Fishermen's organizations among other things are useful in the settlement of conflicts based on rights to fish in a given area. Community-based approaches through these organisations are an important tool in the fisheries management process as the resource users themselves are involved. In Territorial Use Rights in Fisheries (TURFs), there are in built mechanisms for fisheries management through the participation of the community. Some long-standing fishery conflicts have been successfully resolved with the introduction of CBFM in Sri Lanka. Thus for the efficient management of fisheries, the participation of community is essential for the resource management and sustainable development of fishermen in Sri Lanka, BOBP (1996).

Japan

In Japan, coastal fisheries resources are managed by fisheries co-operatives through out the country. Each co-operative has its own by laws within the framework of natural fishery laws and fishery co-operative laws. This legal system empowers co-operatives to exercise a fishery right or some kind of property right over resources within their jurisdiction. Access to territorial boundaries is limited to members of co-operatives. The co-operatives establish regulation concerning boats gear, season, area, mesh size, marketing of fish etc. Fisheries research institutes in Japan play a very constructive role in fisheries management by altering fishermen about the state of resources.

Fisheries co-operatives in Japan play a vital role in CBFM. Their characteristics are (1) all members of the co-operative assign sale of fish to the co-operatives. This enables the co-operatives to understand and assess production trends and the status of management effort. (2) Successful co-operatives have a committee to ensure smooth co-ordination among fishermen on management measures. Such committees have helped mediate, monitor views among fishermen, and establish a consensus on management action. (3) Successful co-operatives comprise of an active study group of young fishermen who help to generate new ideas to set up study groups with the help of fisheries research stations, Hotta (1998).

A law concerning conservation and management of marine aquatic resources, commonly known as the law of the Total Allowable Catch (TAC), came into effect in 1997 to conserve certain endangered species. Continuous efforts are made to integrate TAC system into existing fisheries legislation and management mechanism. The law of the TAC obliges fishermen to report their catches. Japan is a remarkable example where CBFM has succeeded.

India

CBFM: Management in the Gulf of Mannar Biosphere Reserve in Tamilnadu

The Gulf of Mannar is the first marine biosphere reserve not only in India, but also in Southeast Asia. Designated as a national biosphere reserve, the Gulf of Mannar and its 3, 600 species of plants and animals constitute a biologically rich coastal region, one of the richest in all of mainland in India. Management of the Gulf of Mannar Marine Biosphere Reserve (GOMMBRE) is presently being strengthened through a project sponsored by GEP (Global Environment Facility), UNDP and the Government of India, and implemented by the M. S. Swami Nathan Research Foundation, Chennai.

The primary objective of this project is to improve the welfare of local, regional, and national communities while restoring the ecological qualities of the area. The threats to the reserve and its bio-diversity that concerns are (1) Exploitation of natural resources such as coral and sea grass. (2) Dynamite fishing and intensive trawling. (3)

Poaching have threatened and endangered species including sea turtles. (4) Large-scale exploitation of Juvenile fish species. (5) Rapid industrialization around the reserve and (6) unauthorized human settlements.

Present Threats to the Gulf's Marine Resources

In the Gulf of Mannar, the fishery is dominated by lesser sardines, silver belly, mackerel, anchovy, ribbon fish, mollusc and penaeid prawns. These resources are exploited by a multi gear system. Pair trawling drift gill net and bottom set gill nets are operated from the mechanised crafts, beg net, trawl net and hook and lines are operated from motorised and traditional boats, however, in recent years, the intensive trawling for exploitation of resources has become a cause of great concern.

The quality of capture fisheries has been deteriorating steadily because of "too many fishers chasing too few fish", which leads to habitat and environment degradation. Fisheries have been under continuous stress, particularly since the start of large-scale operations. Over fishing also takes place when unwanted species and edible sizes are caught by indiscriminate fishing technology and are discarded overboard. Capture of unwanted species affects the complex food chain and also results in the loss of valuable potential food resources.

Marine resources are under increasing pressure to provide, employment and income for fisher folk as well as investment opportunities for business interest. As the resources are given care must be taken to ensure their sustainability, both in biological and economic terms. Therefore, pressure grows on the community and the government to manage responsibly, the fisheries resources under their control.

People's Participation in Management of Biosphere Reserve

There are 47 fishing villages along the coast of which 38 are in Ramachandrapuram district and nine in Tuticorin district bordering the biosphere reserve area. The fishermen from these villages depend solely on fishing for their livelihood. The Gulf of Mannar Marine Biosphere Reserve as an ecosystem, which has a firm resource base, but over the years the coastal waters have been misused and overused to such an extent that there are visible pressures on fragile Eco-system. Creation of the public awareness would encourage participation of the people in the management of biosphere reserve. It would facilitate a harmonious relationship between indigenous populations and the environment. However, any management intervention requires the support and co-operation of the community. Community representatives made the following point about community participation in resource management during the consultations with community representatives made by BOBP to evolve a participatory management system in Gulf-of Mannar.

1. External support may be provided to-existing village level organizations or societies to strengthen them technically and financially.
2. Village-level societies in turn extend full support for conservation and management of the biosphere reserve and preservation of the environment of the Gulf.
3. Societies may extend loans for fish harvest, processing and marketing activities at low interest.
4. Resource use and regulation activities may be implemented through village level societies.
5. Community development activities may be taken up through village level committees. The local NGOs may be taken up to undertake socio-economic studies and to work for conservation and management of resources at the community level, Rao, Devid and Shanmugaraj, (1998).

The community based Marine Resource Management Programme seems to be gaining momentum. The community of the biosphere area feels that with the support of government agencies, better decisions can be made on planning, allocation of area within the Gulf of Mannar for sustainable use of resources for their development through conservation of biosphere ecosystem. CBFM is in the operational state in India.

Need For Marine Fisheries Management in the Ganjam District

Ganjam is one of the four undivided coastal districts of Orissa having 60 kms of coastline bordering to Andhra Pradesh. The traditional marine fishing is the main occupation of the fishermen living along the coastline. In the 1990s, artisanal fisheries witnessed some remarkable changes, enabling fishermen to push up returns from their catches due to increase in prices of some commercial important species like prawn, sharks, hilsa, pomfret etc., which attracted the Andhra trawlers to encroach the territorial water areas (reserved for traditional fishing) for catching these high valued species in the Ganjam Coast, Ganjam is the only district in Orissa. Where the mechanization is not yet developed. Being assessing the resource potential of Ganjam district, the Andhra Trawler owners are concentrating there fishing in the Ganjam Coast to get good catches. This often creates the conflicts between the Andhra trawler operators and the local traditional fishermen communities. This is happening due to the lack of proper implementation of the OMFRA Act and Rule of 1983 by the Department of Fisheries, Govt. of Orissa to check the illegal fishing of outside trawlers and to conserve the resources for the protection of the interest of the traditional fishermen in the Ganjam district.

Some Issues

There are some issues emerged in the Ganjam coast for the management of local resources and to protect the interest of the traditional fishermen for their sustainable development. These issues are as follows:

1. The illegal encroachment of Andhra trawlers to catch prawn in the territorial waters reserved for traditional fishing is highly exploited which caused poor catch to the traditional fishermen.
2. The outside trawlers fishing in the traditional zone causes damage to the fishing gears of the traditional fishermen in the district.
3. The discard of by-catch by the trawlers created the problem of damaging the unwanted species and fish and prawn juveniles.
4. Due to the development of brackish water, prawn culture in Andhra Pradesh and in coastal Orissa during 1990s has made in the increased demand for prawn seeds. The collection of shrimp seed in coastal areas of Ganjam district was witnessed a good source of seasonal income for the fishermen instead of fishing in the sea. Of late it was realised by the fishermen that it leads to depletion of resources in the sea. So it became a major concern for the management and prohibition of shrimp seed collection.
5. Due to rapid expansion of prawn culture in the coastal areas of Andhra Pradesh, West Bengal, and Orissa and in Ganjam district, it emerged a large number of shrimp seed production hatcheries in the coastal areas, Andhra, Orissa and in Ganjam coast. The need for gravid prawn for hatching shrimp seeds in the hatcheries became a new emerging demand to catch gravid prawn by the traditional fishermen for its high economic value. The cost of gravid prawn, ranges from Rs.2000 to Rs.20.000 even more per piece of gravid prawn depending upon the breeding capacity and maturity period. Most of the hatchery owners depute their agents to collect these rare species during the month from October to December the breeding period of gravid prawn, which is locally known as “Rani Chingudi” or the “Mother Prawn”.

These above issues are realised by the traditional marine fishermen communities in Ganjam district. In these issues the fishermen of all the 27 marine fishermen villages of the district have taken united community efforts through “The Kalinga Traditional Marine Fishermen Association” (KTMFA). It is the association of the traditional marine fishermen of Ganjam district. All the marine fishing villages (Caste councils) are the ex-officio members of the “KTMFA”.

The KTMFA has taken these issues as a challenging activity for the sustainability and livelihood security of the traditional fishermen is Ganjam district of South Orissa. The association has involved actively through community participation in the management and conservation of resource for the sustainable development of fisheries and

fishermen in the Ganjam district. The community based fisheries management approach has been tested in these issues emerging in Ganjam district and to suggest a suitable policy approach for sustainability of these resources for development of marine fisheries in Office.

Some of the recent case studies concerning to the issues happened in Ganjam district have been analysed for assessing the suitability of community based fisheries management to implement in the Ganjam district for the resource management and sustainable development of the fishermen.

Some Case Studies in the Ganjam Coast of Orissa

The fishermen of Ganjam face difficulties due to unauthorized entry of Andhra Trawlers in their territory. The problem of "Trawler Menace" was seriously raised by the traditional fishermen of Ganjam district through the KTMFA of Ganjam district before the concerned authorities and the department of fisheries. Govt. of Orissa to prevent the illegal fishing of Andhra Trawlers in Ganjam coast. Authorities were requested to implement the OMFRA Act and Rules to solve their problems in Ganjam. In spite of several demands and requests of the fishermen concerned department failed to solve their problems.

This problem was so worst that many of the traditional fishermen were gone out of the occupation because of the low catch and sometimes even no catch. This led the traditional fishermen to think over the matter and take own effort to maintain the resource for their sustainable use. As the last resort all the fishermen of the district were united to take community decision for solving their problems concerning the resource sustainability and their livelihood security.

Some case studies are recorded by the researcher during the study, which concerned the community to participate in the management process and to co-operate the government to solve their problems.

Case Study – I: Andhra Trawlers Vs Traditional Fishermen of Ganjam District

As the Department of Fisheries, Govt. of Orissa failed to solve problems of illegal fishing by Andhra trawlers, which are encroaching the territorial water zones reserved for traditional fishing in Ganjam district. The traditional fishermen through their association decided to take the law into their own hands to prevent illegal fishing by the trawlers in Ganjam coast. About 2000 active fishermen of the district gathered in a meeting at Arjipalli on 2.7.99 to discuss their problems, which threatens their livelihood security and resource sustainability. They resolved to start the movement against illegal fishing of Andhra Trawlers. An ultimatum was given to the State Government to solve it before 9.7.99. Accordingly Association communicated their decisions to the concerned authorities of the state and the district to start the community movement from the 10.7.99 in the Ganjam district.

About 800 fishermen along with 200 traditional and motorized boats made preparations to start their operation from Arjipalli to prevent the trawlers. While starting their operation, the district collector, Ganjam intervened in the matter and requested the Association to postpone the movement at least for 5 days in order to pressurise the state Government on behalf of the district administration. With the assurance of the District Collector and Superintendent of Police, Ganjam the movement was postponed till 15th July 1999.

After this issue the district administration appraised the problem before the state government to taken necessary steps to maintain the law and order situation in the Ganjam Coast. By considering all these issues the State Government directed the Department of Fisheries, Govt. of Orissa, Cuttack to issue an ordinance and to notify the orders to ban illegal fishing by outside trawlers in the Ganjam Coast to intensify patrolling in the sea by the armed coast guards to protect the Andhra Trawlers encroaching the traditional area along the 60 kms coast line of Ganjam district.

But the department of Fisheries expressed its inability of not having any speedboat for patrolling by the coast guard operation in Ganjam district. The district administration of Ganjam with the co-operation of the Assistant, Director of Fisheries, Marine, Ganjam took necessary arrangements for conducting the patrolling in the Ganjam

coast to prevent Andhra trawlers during the monsoon periods. This patrolling operation was supported by the traditional fishermen participation.

Case Study II

Two Andhra Trawlers were seized at Arjipalli on 17.7.99 by the KTMFA with the help of district administration and the Department of Fisheries, Ganjam. The two trawlers were seized while fishing in the territorial waters within 2 kms from the shore, which is reserved for traditional fishing under OMFRA Act, Nearly, 50 traditional boats surrounded the trawlers. About 200 fishermen participated in the operation, but they were able to seize only two out of six trawlers at Arjipalli landing center. The rest four trawlers escaped because low speed capacity motorized boats could not chase the high speed moving trawlers, which end beyond their reach.

No fish was found in the trawlers as reported by the Secretary of the association. The total numbers of 14 members were in these two trawlers having 7 members in each trawler.

As per OMFRA Act and Rule 1984 ADF (Marine) Ganjam seized the trawlers and filed a case against two Andhra trawlers before the Deputy Director of Fisheries (Marine) South in the Directorate of Fisheries, Cuttack for judgment of the cases in the fishery court at Cuttack.

As per the OMFRA Act and Rules the trawler owner has to pay the fine as penalties amounting to five times of the total catch seized by the competent fishery authority. In case of not seizing any fish catch, the seized trawler has to pay an amount of Rs. 5000/- as fine for violating the OMFRA Act.

The owners of the two seized trawlers were penalized Rs.5000/- each for their release in the judgment. The trawler owners paid Rs.10, 000/- to the ADF, Ganjam for their release.

This joint cooperation made the community leaders more confident to continue the programme of action to seize the trawlers encroaching the area through patrolling in the coast. This movement taken by the traditional fishermen of Ganjam district created havoc among the Andhra Trawlers owners Association at Vishakhapatnam. The district administration of Ganjam also requested the Andhra Trawlers Owners Association and the Collectors of Coastal districts of Andhra Pradesh, to take necessary measures to check the illegal fishing of the trawlers, to avoid such conflicts among the Andhra trawler operators and the traditional fishermen of Ganjam district who are at stake.

Case Study – III

One Andhra Trawler was seized by the traditional fishermen of village Markandi on 23.8.99 while the trawler was fishing near the village Markandi coast. About 100 fishermen of the village surrounded the trawler by the traditional boats and seized the trawler and the fish caught by the trawler. The seized fish was sold by the village caste council and the total amount of Rs.4500/- was realized from the sale of seized catch. This amount was kept with the head of the caste council of Markandi. Then the matter was communicated to the Assistant, Director of Fisheries, Marine Ganjam and Secretary of Kalinga Traditional Marine Fishermen Association, Ganjam for necessary action in this regard. The total numbers of six persons including the driver were in the seized trawler. They were kept under the custody of the village fishermen community till they were handed over to the concerned authority for necessary action. The ADF Ganjam visited the village and seized the boat.

The Andhra Trawlers Owners Association, Vishakhapatnam interviewed in this matter for release of the seized persons through the mutual co-operation and understanding with the villagers through the KTMFA and the district administration.

By the efforts of all concerns the matter was settled in the village through the participatory approach. The Trawler Owners Association agreed to obey the decisions of the council, assured to pay the penalties, and agreed not to encroach the traditional fishing area in the Ganjam Coast. As per the decision of the council the trawler owner was penalized Rs. 10,000/- and the amount was deposited in the caste council for helping the fishermen whose nets were damaged by the concerned trawler. As this matter could be settled at the community level in the village with

the participation of all concerned stakeholders, this is encouraging signal for the implementation of community based approach to manage the resources and to solve their problems.

It created a confidence among the fishermen and Association to involve actively to prevent the illegal trawler fishing all along the 60 kms of Ganjam Coast involving the village community in the process of management to protect the livelihood security of fishermen. By considering the need of the united community effort, all the fishermen in the district agreed to strengthen their Association through mobilization of financial and physical resources and to motivate all the fishermen to participate actively in the community based fisheries management actions in order to conserve the resources for the sustainable development of the fisheries and fishermen in Ganjam district.

Case Study – IV

The collection of shrimp seed is highly profitable than fishing itself as it has a greater demand during a particular season for prawn culture. The traders from Andhra Pradesh, West Bengal, and some part of the Coastal Orissa were came to Ganjam district for prawn seed collection. As the brackish water prawn culture was highly encouraged during 1990's to earn dollars by exporting prawn. Most of the coastal States took up prawn culture as a profitable business for export earnings.

Due to the demand of shrimp seeds the fishermen and non-fishermen were engaged themselves in shrimp seed collection near the estuaries, creeks and in the sea. In order to catch the seeds they destroy the fish juveniles of unwanted species, which causes a great loss to the stock of other fish and prawn stock. In the later stage the fish stack starts declining due to loss of juveniles, destruction of breeding eggs by the use of very small mesh size nets for catching prawn seeds.

Of late this problem was realised by the traditional fishermen and they resolved not to allow catch of prawn seeds and discard fish juveniles to sustain their catch in future. The KTMFA banned the collection of prawn seed in Ganjam Coast. All the villagers of the coast agreed in this issue and decided to implement the same in their villages. All the marine fishermen villages of Ganjam district restricted and banned for collection of prawn seeds in their village jurisdiction or any where in the coast of somebody found indulged in collecting of prawn seed he or she would be penalized Rs.500/- by the caste council of the respective village. They also decided not to support or co-operate with any prawn seed trader or agent in the village or in the coast.

The ADF marine, Ganjam district seized two vehicles, 1998-99 at the Girisola check gate near boarder while taking the prawn seeds from Ganjam district to Andhra Pradesh. The seeds were released to the sea, cases were filed against the owner of the vehicle and the traders, and penalty was collected from them. This case discouraged the prawn seed traders to take prawn seeds from Ganjam district. It was possible only due to the involvement of the local people in managing their resources. It was a good sign of community participation in resource management.

Case Study – V

In the recent years the catch of gravid prawn is taken up a big business in marine fishery trade "Gravid prawn" locally known as mother prawn and "Rani Chigudi" to the fishermen. This is an important species, which fetches high value for the fishermen in its collection. In order to meet the increasing demand of shrimp seeds a large number of shrimp seed hatcheries came up in the coastal areas of Andhra and Orissa more particularly at Gopalpur in Ganjam district. The gravid prawns are kept in the hatcheries for breeding purpose, which would help them to produce millions of shrimp seed through the laboratories of hatcheries. The fisherman who gets the gravid Prawn while fishing in the sea brings it alive to the shore to sell it to the hatchery owners. The cost of gravid prawn per piece depends upon the size and the maturity of period of the prawn. Its cost ranges from Rs.500/- to Rs.5000/- in the local market but it may be valued at a high as Rs.30, 000/- per piece at Vishakhapatnam.

The Gravid Prawn season starts from the month of October and lasts till December or January every year. The increasing demand for gravid prawn attracted the Andhra trawlers to fish in the coastal areas of Ganjam district to

catch prawn and especially the gravid prawn because of lack of mechanised fishing in Ganjam district. The trawler operators catch the gravid prawn, which is brought to the shore with the help of the local fishermen using their traditional boats. The middleman of Andhra brokers waits in the landing center for the purpose to take it to Vishakhapatnam. For doing this a boat owner gets Rs. 1500/- to 2500/- per trip in a day. The leader of the village who arranges this deal gets Rs.500/- to Rs.600/- per boat or teppa. The local "Dada" and the village "Tautors" takes Rs.300/- to Rs.500/- per vehicle in the name of village development or Temple construction and lastly the police takes Rs.400/- to 500/- per vehicle for allowing them to do this illegal practice. Approximately 15 to 20 vehicles (cars) of Andhra Pradesh were being found in the village of Gokharakuda and Maluda during this period particularly during the month of December. As it is more profitable local fishermen engages in this trade without concerning the problem. As it was observed among the visit to the village Gokharkuda on 27.12.1998.

After realizing its adverse effect on declining catch, the fishermen of Ganjam district through the KTMFA resolved to stop catching of gravid prawn in the district. The Association decided to fix penalty for the fishermen who associate themselves in this trade along with severe punishment by the village Panchayat and the Association. All the marine fishing villages of Ganjam district resolved to check this trade in Ganjam district. The only marine fishing village Gokharakuda was involved in this trade till the last year, 1999. But previously several villages like, Sonapur, Argipalli, Gopalpur and Prayagi were involved in this trade. At present Gokharakuda has also stopped this trade.

The Assistant Director of Fisheries (marine) Ganjam is authorized to check the illegal practice of taking gravid prawn during the breeding period to other areas according to violation of OMFRA Act and Rules of the State government. But due to lack of support of administrative machinery and required facilities the department failed to check this practice. However, the community action succeeded in the management of the marine resources for their sustainability.

Cast Study – VI

The Department of Fisheries, Government of Orissa organised a high level meeting at Gopalpur on 19.8.99 to discuss various issues of fisheries development and management in Ganjam district. The Secretary, Dept. of Fisheries and Animal Resource Development, Govt. of Orissa was the key person. The meeting was presided by the collector, Ganjam. The Director of Fisheries, Govt. of Orissa, Cuttack and all the State and District level officers and the office bearers of KTMFA and the village community heads of all the marine fishing villages were invited to share their views and opinions to take up issues of community based management in Ganjam district.

The Collector, Ganjam requested the Secretary, Department of Fisheries to take necessary steps to control illegal fishing of Andhra trawlers in Ganjam coast, and to make policies to ban fishing during the breeding seasons in the monsoon months and to prevent the collection of shrimp seed and gravid prawn in Ganjam coast and to take other measures for the sustainable development of fishermen in Ganjam district.

The office bearers of the KTMFA requested the principal secretary as the official chief of the department, Govt. of Orissa take necessary measure to protect the livelihood security of the fishermen. As the catch is decling and the fishermen is not in a position to get the minimum income from fishing to sustain their livelihood in this occupation. They argued upon the govt. to take necessary measures to solve their problems and to conserve the resources for their sustainable use

The secretary assured the fishermen, association and the district administration to provide two speedboats with in one year and one sona boat for patrolling within two months, so as to control the illegal fishing. He appreciated the participating approach of the community in solving their problems and taking the resource management measure for their sustainability. He assured the district administration and the Association to extend all help to protect the resources through community approach and to implement the Government Fisheries Management Plans through the collective action of the community. He stressed to introduce mechanisation of fishing in Ganjam district. He also assured to have a "New Fishery Policy" for the development and management of fisheries in Ganjam district and

Orissa.

Marine Fisheries Policy in Orissa

The marine fisheries in Orissa has been under taken since 1983-84 through the enactment of Marine Fishing Regulation Act and Rules to protect the interest of traditional fishermen and for conservation of marine resources for sustainable development of fisheries or fishers. The act is discussed in detail as

Orissa Marine Fishing Regulation Act and Rules:

Orissa Marine Fishing Regulation Act 1982 and Rules 1983, has been enacted which came into force from 1984. Mainly to protect the interest of the traditional fishermen from fishermen from encroachment of mechanised boats to the traditional fishing zone as well as to check ad prohibit the intrusion of the outside trawlers from neighboring states into the territorial waters of Orissa to conserve marine fishery resources. The area reserved for traditional and mechanised vessels as per Orissa Marine Fishing Regulation Act and Rules is as under OMFRA, 5 kms area from the coastline exclusively reserved for traditional crafts and beyond 5 kms from the shore and with 10 kms area from shore reserved for the mechanized boats upto 15 meters length and above 15 meters length crafts are allowed to fish beyond 10 kms from the shore.

Present Fishery Policy Proposal in Orissa:

The Director of Fisheries, Government of Orissa has given a proposal, which is under active consideration of the State government.

1. To impose ban on fishing for 60 days from First July till 31st August during the monsoon period for conservation of resources.
2. Imposition of regulations over mesh size of “Codend of Tramel Net” from 20mm to 30mm. for better recruitment at sea level.
3. Restrictions on entry of New fishing boats especially mechanized boats in Orissa coast, particularly in inshore areas.
4. The conservation and protection of “Olive Riddle Turtle” a rare species which are coming to Orissa coast, particularly at Gahirimatha Coast of Dhamara river mouth in Kendrapada district of Orissa for laying eggs which is of national concern for its conservation and protection.

In this regard Government of Orissa has taken several measures for conservation of sea turtles in Orissa coast through various Government notifications:

1. Coastal waters up to 20 kms from the shore have been declared prohibited area for fishing during nesting period of sea turtles.
2. Seaward radius up to 20 kms from Gahirimatha has been declared as “Wild Olive Riddle Sanctuary” and within this area fishing has been prohibited through out the year.
3. Fishermen have been asked not to use the “Multifilament” gill net instead of monofilament gill nets for fishing.
4. Trawler operators have been instructed to use “Turtle Excluder Device” (TED) while operating trawl net.
5. State government has requested the Government of India to depute expert penal team to Orissa to study different aspects concerning to sea turtles arrival and measures required to be taken for their conservation and protection.

Conclusion

The study concludes that the Community Based Fisheries management has several advantages and this can be used as an alternative to the conventional centralized marine fisheries management system. The CBFM allows all stakeholders greater participation in decision making process, hence it creates a transparent and effective management system. The stakeholders will harbour a feeling of "ownership" concerning all decisions through collective action and community participation. In other words all stakeholders will be able to internaalize the external cost of using the common fisheries resources. The management will be more effective when all stakeholders will voluntarily comply with rules tht they had themselves agreed to. At the same time, the government's financial burden in managing the marine fishery resources will be reduced.

The CBFM is found efficient and popular among the South East Asian countries like Malaysia, Thailand, Indonesia, Vietnam and Japan. In Sri Lanka and India the CBFM approaches is thought to be implemented for conservation and management of marine fisheries resources.

The fishery policy of the Government of Orissa is mainly concerned with enacting regulations and control to conserve the marine resources and to protect the interest of the traditional, marine fishermen. The results of the case studies in operationalising the collective action of fishermen of Ganjam district shows a positive and clear indication for successful implementation of CBFM in the state. This study suggests to implement the CBFM in Orissa for sustainable development and management of marine fisheries resources and fishermen in Orissa.

References

BOBP, Report-72 (1996) "Sri Lanka / FAO National Workshop on Development of Community – Based Fishery Management" Bay of Bengal Programme, Chennai, India.

Chong, K.C. (1996), 'Responsible Fish Consumers' Can Strengthen Fisheries Management,' Bay of Bengal News, Vol. II (3), The Journal of BOBP, Chennai, India.

Chong, K.C. (1999), "Small Scale Fisheries in Bay of Bengal Region: New opportunities in New Centuries." Bay of Bengal News, Vol. 13, BOBP, Chennai.

Clowson, M. (1972), "Emerging American Lifestyle" in M. Hormachea eds. Recreation in Modern Society. Halbrook Press, Boston.

Cornes, R. and J. Sandler, (1986). "The Theory of Externalities, Public Goods and Club Goods", Cambridge University Press, New York.

Gordon, H.S., (1954) "The Economic Theory of Common Property Resources: The Fishery". Journal of Political Economics, 62 (2).

Govt. of Orissa, (2001). "Handbook of Fisheries Statistics" Director of Fisheries, Govt. of Orissa, Cuttack.

Hotta, M. (1996), "Contribution of Fish Marketing to Fishery Resources Management in Asia", Bay of Bengal Report-72, Chennai.

Ibrahim, M. (1987) "Selective studies on Malaysian Trawls. Ph.D. Thesis, Pertanian Malaysia, Sardan, Malaysia.

Indo-Pacific Fishery Commission, (1994) "Proceedings of the symposium on socio-economic issues in Coastal Fisheries Management, Bangkok, Thailand, RAFA Publication, 1994.

Kamarzuman, H.S. (1997) "A Socio-economic Assessment of Collective Choices in the Coastal Travel Fisheries of Malaysia." University of Hall, England.

Lawn, W.C. and D. Panthansali (1977), An analysis of Penang Trawl Fishery to determine the maximum sustainable yield, Fisheries Bulletin, 16, Ministry of Agriculture, Malaysia, Kuala Lumpur.

Pemeroy, R.S. (1994) “Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences, ICLARM conference proceedings.

Rao, M.J., P.V. David and T. Shanmugaraj (1998). “Community Based Marine Resources Management in the Gulf of Manner Biosphere Reserve, Bay of Bengal News, Vol. II (10), Chennai, India.

Sahu, P. (2000) “Marine Fishing and Sustainable Development of Fishermen in Ganjam District, Orissa,” Ph.D. Thesis, Berhampur University, Orissa.

SEAFDEC, (1997), “Proceedings of Regional Workshop on Responsible Fishing” Bangkok, Thailand.