

Technological Changes in Marine Fishing and Livelihood Threats of Fisher Folk

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ABSTRACT

The growing demand for fish in the developed and developing countries and the recognition of its place as a balanced diet to the rapidly growing population ensuring food security and as a foreign exchange earner are creating immense pressure on the world of fisheries. In the context of stagnating/depleting catches, sustainable development of fisheries sector and the livelihood of fishers become problems. The concern over the sustainability of fisheries resources and the resulting threat on the livelihood of the traditional fishers in Kerala form the subject matter of the present study. The study includes descriptive, exploratory and confirmatory research. It reveals that technological developments resulted in the stagnation/declining of marine landings in Kerala. It also identifies the sustainability issues which are directly or indirectly related to technology. Institutional and human conditions like open access, greed and competition make the situation more insecure. Pollution, discards and other institutional factors cause ecosystem damages and the fishers face livelihood threat and insecurity. Apart from these the fishers are deprived of livelihood assets. The threats faced by the fishers are related to work, environment, financial requirement, marketing difficulties and administration. It concludes that the policies adopted to ameliorate the livelihood conditions of the fishers must be based on the specificity of the need in each particular region. Further studies should be undertaken at the local level emphasizing the concept of sustainable development technology and Place Suited Community Centered Co-management where the principle of subsidiarity should be followed.

Keywords: *sustainability, over fishing, discards, livelihood threat, and place based community Centered co-management.*

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Introduction:

Marine sector helps the nations and their people to share resources and to accelerate the social and economic development. In India this sector has been recognised as a powerful source of foreign exchange. The sector generates employment and it stimulates the growth of a number of subsidiary industries and also ensures food and nutritional security. The application of modern technology acts as a powerful instrument for understanding the marine ecosystem. At the same time the application of modern technology is linked to its deterioration and overexploitation. As a result of modernisation and developmental process the sustainability of the resource and the livelihood of the fishers are

threatened. The issues related to technological developments, institutional and policy failure affect the livelihood of fishers with the stagnating and declining marine resources. The study attempts to deal with the above issues along the coast of Kerala. Increased competition for fisheries resources has resulted in 'over fishing' and 'destructive fishing methods'. The technologies which were supposed to enhance the production and productivity cause threats and warned that the exercise of policy formulation should ensure not merely growth, but growth that promotes the human development and sustainability between ecology and development. The concern over the sustainability of fisheries resources and the resulting threat on the livelihood of the traditional fishers is the subject matter of the present study.

Research Problem of the Study

The fisheries resources in Kerala are on the threshold of stagnation and a collapse of fisheries will affect the livelihood of fishers and other stake holders who largely depend on fisheries. In India we can't have moratorium on catching as the population who depend on fisheries resource is high. Focusing the issues on technological changes, sustainability of ecosystem and livelihood aspects the researcher finds the need of a collaborative work linking technology, conservation and livelihood. And there is the need of an interdisciplinary work. So the interdisciplinary approach by Tony Charles is adopted to understand "what the fishery is about," linking conservation, economics and community. As noted by The World Commission on Environment and Development (Brundtland et al.1987) for development to be sustainable, it requires a combined focus on society, economy and ecology. This idea of sustainability has later been refined by the World Bank into the triple P concept: people (social issues), planet (ecological issues), and profit (economic issues) (Seregeldin 1996; Seregeldin and Steer 1994). So the primary concern of the study is to address the social, ecological, economic and institutional issues related to fisheries resources for human welfare and the need for conservation of resources for use by future generations. In particular an attempt has been made to look into the technological changes and its consequence on ecosystem and the livelihood of the marine fishers in Kerala.

Research Questions

1. What are the important technological changes that have occurred in the fisheries sector?
2. Do the technological changes constitute a threat to the marine ecosystem and whether there is overfishing?
3. What are the problems associated with modernisation and what is the present condition of livelihood?
4. What is the role of institutions – governmental, non-governmental and civil society to strengthen the livelihood base of the fisher folk?

Objectives of the Study

1. To discuss the evolution of fishing technology with special reference to marine fisheries of Kerala.
2. To analyse the economics of fishing in the marine sector.
3. To analyse the trends in marine fisheries landings in Kerala and to synthesise the sustainability issues in the sector.
4. To explore the reasons behind the sustainability issues in marine sector.
5. To investigate the livelihood assets of coastal fishing communities in Kerala.
6. To examine the threats to the livelihood security of fishers.

Hypothesis

The main hypothesis of this study is that technological changes resulted in the stagnation/depletion of marine landings which affected the livelihood of fishers.

Methodology of the Study

The study was carried out by using survey method, selecting a representative sample from the population considered. Districts Thiruvanthapuram from southern region, Alappuzha from Central region and Kannur from the northern region were selected and from these districts fishing villages were identified. Thayyil in Kannur, Arthunkal in Alappuzha and Adimalathura in Thiruvanthapuram were chosen in order to get the representation of three regions. The selection was in concurrence with the divisions based on the different technological aspects also. After conducting the pilot study the sample size was decided as 620. For the collection of primary data, in-depth interview was conducted with the help of schedules. Group discussions were also conducted in order to understand the perceptions, awareness and knowledge about fishing activities and livelihood. Secondary sources of information were used to know the general trend of fisheries and species wise trend along with answers to questions related to the research. Analyses range from simple descriptive techniques to high end methods involving some multivariate and non-parametric methods. The researcher has made use of Microsoft Excel spread sheets and the statistical package SPSS for carrying out the analysis. The study includes simple cross tables for description as well as to validate observed

dependence among attributes. The validation is done using Chi square tests for independence. More hypotheses involving other variables are analysed using methods including multi-dimensional scaling and factor analysis. Depending upon the research requirements other statistical methods were also used.

Summary and Findings of the Study

The study attempts to examine the problems holistically by linking various issues relating to technology, economic, social and ecological aspects. Literature of the study was reviewed theoretically and empirically which help to lay a sound base and also to know the previous areas of related works and their methodology.

The major technological developments and their diffusion transformed the fisheries sector of many third world nations. Bilateral and multilateral agencies have been instrumental in promoting fisheries development which resulted in the adoption of capital-intensive fishing technology.

In India before independence, fishing was an entirely artisanal occupation with, little intervention from the outside world. The modern technological change that occurred in India was with the inception of the five-year plans. Mechanisation became rampant in the fisheries sector of Kerala. The lucrative profits by mechanised sector led the traditional sector into abject misery. This resulted in motorisation and outboard motor boats were introduced which gave a new face to the traditional fishing sector. A comparison of actual and estimated optimal marine fishing fleet showed excess capacity in India and also in Kerala.

Recent advances in gear and engine technology helped the fishers. The technology like Global Positioning System provided fishermen with equipment to reach the potential fishing ground accurately. Even though these technological changes increased fishing capacity it resulted in overfishing, catching of juveniles and damage to ecosystem thus questioning the sustainability of the sector.

The work culture, income and marketing details give a disturbing picture of economics of fishing and the livelihood activities carried out by fishers.

The trend analysis is done to check whether there is compatibility with the perceptions and the data regarding landings. The perceptions regarding selected species across regions lead to concern over

sustainability of marine fisheries. Trend for the last 30 years shows fluctuations in landings and the opinion of fishers shows that the species are declining. For the last 10 year period (2001-02 to 2010-11) the trend for all the selected varieties of species, landings are declining. A particular point to be noted is that all the landings of the selected species are stagnant or declining toward the end period though there is a massive technological improvement and innovations in the catching sector. The sustainability issues identified by the researcher include overfishing, institutional factors, pollution and the problem of discards which are directly or indirectly related to technology.

The findings of Multi-Dimensional Scaling (MDS) technique reveal that the two main reasons for discarding the catch are lack of marketing and storage facilities and small size of the fish. The findings of MDS reveal that disposal problems and activities near the sea are important reasons agreed to by the sample at different levels for pollution. Due to the above sustainability issues of the ecosystem the livelihood of the fishers are under threat.

The livelihood assets of fishers are classified as natural assets, physical assets including fishing, housing and durable assets, technological assets, social assets including health and education, financial assets and institutional assets. The researcher enquired about the benefits they received from government, NGOs and the community. The findings reveal that the benefits given by the government are not received in the grass root level and they are not satisfied with the present level of institutional set up.

On this context they are asked whether the living standard is low when compared to the main stream class and they unanimously have the opinion that the standard is low. Also the researcher identified thirteen related variables, which are supposed to measure the low standard of living and by conducting factor analysis the important factors related to threats were identified. The new factors identified are work to earn, environmental factors, financial requirement, marketing difficulties and administrative problems. Using these measurements, further analysis was done to determine the possible directions of variation among the three regions of Kerala and the result shows that there exists region wise variation in these determinants.

Conclusion and Suggestions

Modern technology competes with the traditional, depriving of the livelihood and depleting resources. Owing to inadequate opportunities for modern employment and inadequate access to basic human rights majority of fishers are marginalised from the mainstream social, political, economic processes of the societies they live. To solve this lopsided development we should strengthen the societies with secure and satisfying livelihoods along with the sustainable use of ecology and natural resources

The concept of community based co-management approach is of great relevance where the principle of subsidiarity should be followed. This stewardship should be carried out at the local level. Policies adopted to ameliorate the livelihood conditions of the fishers must be based on the specificity of the need in each particular region. For carrying out this, place suited community centered co-management should be adopted.

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