CHAPTER II

THEORETICAL FRAMEWORK, CONCEPTS AND REVIEW OF LITERATURE
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2.1. Theoretical Framework

Fishing industry is characterized by an open-access regime. In this regime, the individual receives all of the economic benefits accruing from the fisheries. The resulting stock depletion is shared among all resource users and this eventually results in the tragedy of the commons (Hardin, 1968). Garrett Hardin’s theory of the tragedy of the commons is one of the most cited publications of recent times, and is also among the most influential theories for ecologists and environmental policy researchers. His theory was developed based on the findings of Gordon (1954) model on Bio-economic equilibrium which states that, the consequences of open access systems are that, fishermen will continue to enter the fishery sector as long as revenues minus costs remain above zero, until ultimately the net revenue of the entire fleet is zero thus the bio-economic equilibrium (Gordon, 2010). Gordon, whose model was developed ten years before Hardin also argued that at this equilibrium the resource is depleted as far as economics will allow and fishermen will move to alternative fisheries, resulting in the sequential depletion of fish stocks,. Hardin in his theory, therefore drew a conclusion that there is a tragedy as each man is locked into a system that compels him to increase his herd without limit, thus in a world that is limited. Drawing from these theories, it is therefore of no doubt that a situation whereby too many fishermen turn to chase too few fishes, could eventually lead to conflicts over access to these resources. With so many years after Hardin’s theory, many open-access resources have indeed resulted in tragic levels of overuse and sometimes destruction.

Many scholars and public officials have relied upon the conventional analysis to justify the need for centralized control of all common-pool resources through the
creation of National legislation where the administrative responsibilities for managing natural resources have been turned over to centralized agencies (Ostrom, 2008)

Human capital theory under neoclassical economics is based on the premise that the labour market is open and competitive. In this competitive climate, wages are determined by the amount of human capital that workers possess. Human capital consists of knowledge and skills acquired in school so, according to this argument, those who stay in school the longest build up supplies of human capital that will make them the most productive workers (Becker, 1964). Some economists contend that increasing years of employment experience also contribute to human capital reserves (Mincer, 1974). Those with the most years of education and experience receive the highest earnings and occupational prestige because they make the greatest contribution to productivity.

Although human capital theory focuses on the experience of men, it suggests that women's wages are relatively low because they leave the labour market to bear and raise children, forfeiting the opportunity to build up stores of human capital (Mincer & Polachek, 1974).

The market signalling or filter theory of higher education, suggests that higher education acts as a screening device, selecting the most promising students and preparing them for the workplace (Arrow, 1973; Spence, 1973; Thurow, 1975).

Both human capital and market signalling theories link educational achievement to productivity: increased education means higher skill levels and these are reflected in higher earnings and occupational prestige for the most productive individuals.

The Weberian version of credentialism suggests that culture is symbolically created through day-to-day communications, so that successful students master the culture of the most influential status groups by acquiring the manners and habits necessary for occupational success (Collins, 1971, 1979; Parkin, 1979).

The classical and neoclassical approaches together reside in the use of (quantifiable) monetary units to measure poverty and the readiness with which policy
prescriptions can be put into practice. They also highlight the influence of incentives on individual behaviour as well as the relationship between productivity and income.

Even though the neoliberal school led by the new-Keynesians also adopts a money-centred, individual stance towards poverty, the importance assigned to the functions of the government allows for a greater focus on public goods and inequality. For instance, a more equal income distribution can facilitate the participation of disadvantaged groups of society in the type of activities that are deemed essential under broader notions of poverty. On the other hand, new-Keynesians are in line with neoclassical economists in their belief that overall growth in income is ultimately the most effective element in poverty removal.

Publicly provided capital (including education) has an important role to play, with physical and human capital believed to be the foundation for economic prosperity. Unlike the classical approach, unemployment, viewed as a major cause of poverty, is largely seen as involuntary and in need of government intervention to combat it. Excessive inflation, high sovereign debt and asset bubbles are other macroeconomic factors, besides weak aggregate demand, believed to cause poverty.

By suggesting radical changes in the socio-economic system, Marxian economists and other radical theorists highlight the possibility that economic growth alone may be insufficient to lift poor people out of (relative) poverty, because those who belong to certain classes may not reap any of the benefits of overall income growth. Similarly, by emphasising the concept of class, it provides a shift in perspective, focusing on group (rather than individual) characteristics, with individuals’ status considered dependent on the socio-economic environment in which they live. Within a capitalist system, alleviation of poverty may require minimum wage laws, action to eliminate dual labour markets, and antidiscrimination laws. The exploitation of the poor by the rich groups in society may also occur via the quality of the environment; for example, the poor tend to suffer most from air pollution (normally generated by the wealthier groups) given their residential location. A further contribution of Marxian.radical economists is the sense that poverty is a moral as well as a technical issue. This is often lacking in more mainstream economic frameworks,
except when they (e.g. Sen) integrate political theories of justice in their analytical framework.

The sustainable livelihood approach, which is prominent in recent development, seeks for a greater involvement of all stakeholders with specific sets of guiding principles and an analytical framework for fisheries management (Neiland, 2004). These set of operational principles aim at reducing poverty and vulnerability in communities engaged in small-scale fishing, their assets and access to fishing grounds, fish processing and trading (Stirrat, 2004). The main idea is to build stakeholder capacity to improve poor people’s access to natural resources through the application of sustainable livelihood approaches.

2.1. Concepts

The clear cut understanding of the research is feasible with a thorough understanding about the concepts used in the thesis. Therefore, the concepts used in this research report are presented in this section in a nutshell form.

2.1.1. Fisheries

The term fishery is used in singular as well as in plural depending upon the context. It is used synonymously with fishing industry. The term fishery also comprises one more stocks of fish that can be traded as a unit for purposes of conservation and management (Younis, 1982). Fishery is a stock or stocks of fish and the enterprises that have the potential of exploiting them (Anderson, 1977). Fishery is the phenomenon of heavy catches of fish over a long or shorter period (Devanesan, The Common Food Fishes of Madras Presidency).

2.1.2. Fishing Craft

Boats or any crafts used in fishing.

2.1.3. Craft Owners

The owners of fishing craft such as boats, canoe, etc. through which they earn income for their livelihood.
2.1.4. Fisherman

Bailey defines a fisherman as one who uses fishing craft (Bailey, 1982). John Kurien defines fishermen as that category of persons who earn their main source of livelihood by actually, actively being involved in the process of catching fish using non-mechanised means of production (Kurien J. , 1981).

Prasad defines a fisherman as a person who may culture or capture fish or process or market the same (Prasad, 1985). The All India Census of Marine Fishermen Craft and Gear defines marine fisherman as one who is engaged in marine fishing and associated activities.

In the present study a fisherman is referred to a person who belongs to the fishing community and who is engaged in fishing, fishery-related activities.

2.1.5. Fisherwomen

Woman, in fisheries means woman from fishing families or fishing communities, whose socio-economic status and well-being are determined by the uncertainties of fishing. In a strict sense, the term woman in fisheries is used to indicate women who are involved in fish related activities like marketing, processing, net making, picking etc. (Gracy, 1998).

2.1.6. Marine Fishing Workers

A fisherman who works for wage sharing in exploiting the marine resources like pearl, chunk, fish etc.

2.1.7. Fishermen Household

Any household where in at least one member of the family is engaged either in active fishing or fishery related activities and gets more than 50 per cent of the annual total income from this source.

2.1.8. Fisher Children

The children who engaged in marine fishing activities and / or allied activities as their full time or part time work to earn livelihood.
2.1.9. Allied Activities

Activities like fish trading, processing, curing, transporting, loading and unloading, net splicing and repairing, boat building and repairing, etc., activities related to fishery.

2.1.10. Wages

The wages are paid to labour for its services. In fishing industry labour is given a share in the value of total catch after deducting the cost of inputs like diesel and ice.

2.1.11. Wage Earners

Fishermen or fisherwomen who does not own boat of any kind but engaged in fishing and allied activities for earning wages.

2.1.12. Time of Fishing:

Full time: Fisher folks engaged only in fishing or allied activities as their profession for livelihood.

Part time: Fisher folks engaged in fishing or allied activities as well as in other activities for their livelihood.

Occasional: People who engaged in fishing without time frame and not coming under full time and part time.

2.1.13. Fishing Season

The season of fishing months are classified under four heads.

a) Post monsoon (January to March)

b) Summer (April to June)

c) Pre-monsoon (July to September)

d) Monsoon (October to December)

April and May months are fishing holidays in the study area i.e. Government ban period for fish breeding.
2.1.14. Fishing Crafts (Boats)

Fishing crafts are most essential for catching the fish in large scale in water bodies. A large variety of crafts (boats) have been designed for marine and inland fishing in India. The types of fishing crafts of India falls under two general categories. These are non-mechanized and mechanized fishing crafts.

Non-mechanised boats

The categories of fishing craft types comes under non-mechanised are Catamaran, Dugout-Canoes, Plank Built Canoes, Masula Boat, Built Up Boats.

(i) Catamaran: The simplest type of fishing craft may be taken as the one formed by a few curved logs of wood joined together forming a kind of floating raft, such as the ones used along the east coast of India. Four types of catamarans are prevalent in Indian waters, namely the Orissa type, Andhra type, Coromandal type and Kanyakumari type (Kerala Agricultural University, 2015).

(ii) Dug-out Canoes: A simple type of fishing craft for fishing within short distances from the coast is a small-sized canoe made by scooping logs of wood in the form of boat. The “Odams”, “Thonies”, “Vanchies” etc. of the southeast and south-west coasts of India come under this category. In calm weather, oars may be enough for propulsion; but if winds and currents prevail, sails may be used (Kerala Agricultural University, 2015).

(iii) Plank-Built Canoes: This is an enlarged variety of dug-out canoe made of planks on the sides, largely used in Kerala (Kerala Agricultural University, 2015).

(iv) Masula Boats: It is made of non-rigid planks sewn together with coir ropes and is common along Andhra coast (Kerala Agricultural University, 2015).

(v) Dhinighi: This is a carvel type of boat designed and constructed for a variety of purposes including fishing (Kerala Agricultural University, 2015).

(vi) Outrigger Canoes: Sometimes plank-built canoes may be provided with a single outrigger as in the “Rampani” boats used for capturing mackerel in Karnataka.
(vii) **Built-up boats**: In most of the boats made at present, the carvel type of boats is built up of planks. The best type of built-up boats is seen in centres along the northeast coast of India (Kerala Agricultural University, 2015).

2.1.14.1. **Mechanised boats**

With the advent of mechanization of the fishing crafts, small and medium sized boats, 10 to 15 m long, are constructed with engines operated by oil for venturing to distant coastal areas in search of fishing grounds. The mechanised crafts are line boats, trap boats, dol netter, gillnetter, trawlers (Kerala Agricultural University, 2015).

(i) **Hand line boat**: Hand line boats can be operated both in the shallow and deeper waters. The traditional hand liners use no winch. In India the gear usually consists of a few meters of monofilament of 0.5 mm to 1 mm diameter to the end of which is attached a hood and a sinker, usually a small stone. They are used to catch all kinds of demersal fish from motorized as well as small-mechanised vessels (Kerala Agricultural University, 2015).

(ii) **Pole and line fishing vessel**: Pole and line fishing vessels are fitted with a narrow platform protruding all-round the vessel at deck level, outside the bulwarks. The platform extends forward from the stern to the fore-end like a bowsprit. The crew stands on the platform with their backs to the riel when fishing with the poles. The most popular craft for pole and line fishing in India is ‘mas odi’ of Minicoy. It is a wooden craft 12.5m long and 3m wide at the stern, made from venteak, coconut or aini wood. The back end is provided with a broad raised fishing platform. The propulsion of the craft is by sail or by oars. Nearly 20 to 25 men work on each craft (Kerala Agricultural University, 2015).

(iii) **Trolling vessel**: Trolling line boats tow lines extending on either side to catch pelagic species having high individual value and good quality, such as tuna and barracuda. A number of lures hanging from outrigger poles through lines are towed
from a slowly moving vessel. The fish hooked after snapping at the lure are brought on board as the line is hauled in. The lures after detaching the fish are put again into the water. The vessels length vary between 25’ - 50’ and have normally a forward wheelhouse arrangement allowing a clear working deck aft (Kerala Agricultural University, 2015).

(iv) **Dol Netter**: The Dol netters are used for operating the Dol nets, which are basically fixed bag nets. The dol netter varies form 8-14 m length, 1.5 m to 3.6 m in breadth and 0.8 m to 1.8 m in height. The carrying capacity of each of such boats varies from 2-14 tonnes. Each of these boats is fitted with 2-4 cylinder diesel engines (Kerala Agricultural University, 2015).

(v) **Gill Netter**: Vessels of almost any size can undertake gill netting. The number of nets used for fishing is adjusted to suit the size of the operating vessel. The vessels vary in length between 25’ and 55’. The deck must be so laid out that the gear can be conveniently stowed, with a clear passage from bow to stern so that the gear can be passed after hauling. An arrangement with wheelhouse and engine room forward or behind may be used depending on the operating method adopted. In a typical arrangement with the engine and wheelhouse in the backward configuration, sufficient deck space must be available behind the house for storing and handling the net. A forward arrangement can also be used for side hauling, in which case the wheelhouse is sometimes so located to provide a clear working passage (Kerala Agricultural University, 2015).

(xiii) **Stern trawlers**: Fishing over the stern can be a very efficient way of trawling. Stern trawling is the most wide-spread method of fishing in India. The vessels range in size from 32’ to 55’ in length and may be fitted with 60 to 120 horsepower engine and above. Vessels above 45’ in length may also be constructed in steel. The most common deck layout is such that the wheelhouse is just forward of amidships with working deck behind. The winch powered by the engine is located behind the
wheelhouse with the warps leading to the gallows located at the middle or sides of the stern, from which the otter boards hang (Kerala Agricultural University, 2015).

2.1.14.2. Motorised Craft

These crafts are made of wooden frames and planks with in-built Kirloskar diesel engines with horsepower of 12 to 18. The length of the boat is 28 to 32 feet and the required manpower for operation is 3 persons. This craft is called country craft.

2.1.14.3. Shore Seine

These are constructed by the use of wooden frames and planks. Length of the craft is 30 to 36 feet. Required manpower for operation is 20 to 30 persons. It is locally called ‘Thoni’.

2.1.15. Productive Fishing Hours

The fishermen operating both mechanized boats and traditional crafts believe that more fish can be caught in the 'dawn' and in the 'dusk' which they call 'Valippupaadu, (dawn catch) and 'Chekkalpaadu' (dusk catch). It has resulted in the concentration of crafts in the fishing grounds during 'dawn' and 'dusk'.

2.1.16. Marine Products

Marine Products include all varieties of fishery products known commercially as shrimp, prawn, lobster, crab, fish, shell-fish, other aquatic animals or plants or part thereof and any other products which the authority may, by notification in the Gazette of India, declare to be marine product for the purposes of this Act.

2.1.17. Assets and Liabilities

Assets refer to movable and immovable items. The movables are livestock, radio/transistor, cycle, motor bike, car, jewels, furniture, boats, consumable durables, and productive investment like machineries. The immovable assets are house, dry land, wet land and others if any. Liability is the excess of annual expenditure of a
household include the past debts earned by the household together with the interest charges payable by the households.

2.1.18. Gross Income

It refers to the volume of output per year. Gross income is computed by multiplying the main products and the by-products by their respective prices and then adding the two figures. In fishing industry, gross income is derived from the sale of different species of fish by the craft owners, fishermen, fisherwomen and fisher children. The income information is collected for each category of fisher folks as weekly income and converted into yearly income in order to explore the economic status of the sample respondents.

2.1.19. Net Income

Net income represents the remuneration for the management and is computed by deducting all fixed and variable expenses from the gross income. In fishing industry the net income is derived by deducting the fixed costs such as depreciation, interest on capital and variable cost such as wages, fuel, repairs and the cost of ice from the gross income.

2.1.20. Livelihood

It refers to an occupation which enables a person to meet all the basic necessary of life.

2.1.21. Savings

Excess of expenditure out of income kept in banks or in other sources for future use.

2.1.22. Debt

Debt refers to the excess expenditure over income by borrowing. It arises due to low family income or excess of expenditure on consumption, social functions etc.
2.1.23. Diesel and Oil Lubricants

The mechanized boats and motorised Vallams consume diesel, oil and lubricants in the course of the fishing operations.

2.1.24. Insurance

Insurance is defined as the simplest safeguard against risk. It provides a substitution of a small known cost for the possibility of a larger but uncertain loss. In the mechanized boat sector, the capital investment is high and hence insurance has become necessary. The boats and nets in traditional sector are not insured. The engines used in mechanized Vallams are insured. Insurance does not cover the repair charges of the boats and nets. It gives protection only against the unforeseen risks, like accidents.

2.1.25. Castes

In India the caste system is followed for reservation in employment and education under Government sector in order to lift the downtrodden people socially and economically. The caste system exists in India and included in this study are:

- SC – Scheduled Caste
- ST - Scheduled Tribes
- BC – Back Ward Class
- MBC – Most Backward Class
- General (Upper Caste)

2.2. Review of Empirical Literature

The review of earlier studies provides an insight into the findings of socio economic researches. Further, review of literature provides a learning platform for a researcher as it shows the experiences of other researchers in their studies. Therefore, the researcher of the present study has made an attempt to review the previous studies on socio-economic conditions of marine fisher folks and presented in this section in chronological order.
Fishermen of our country have a distinct tradition of their own. They belong to all the major religions namely Hinduism, Christianity, Islam and several communities which differ from State to State. In the society, the fishing community occupies a low status. Majority of the fishermen belong to an economically weaker section and follow traditional methods of fishing employing indigenous crafts and gears. The average size of the fisherman family varies between 4.7 and 8.6 in different States. By and large, they are perennially indebted to the middlemen who advance financial help to them in times of need in return for their entire catch assessed at a low price. Several factors such as a low social status, poor economic conditions, illiteracy, heavy inter service of middlemen, traditional fishing equipments and methods of fishing, low production rate and income influence the socio-economic conditions of fishermen. Right from the beginning of the first Five Year Plan, this sector has been receiving considerable attention from the Government. Various schemes for providing housing facilities, dispensaries and community amenities, approach roads etc, are given priority. Organised attempts are made to promote fishery co-operatives in our country. (CMFRI, 1977).

A study undertaken in Karnataka in 1978 to assess the socio-economic impact of mechanisation on traditional fishermen operating rampant gear revealed that the introduction of commercial purse seiners had affected the rampant operation. The number of rampant nets operating in South Kanara District declined from 75 in 1977 to 30 in 1979 and a marginal reduction was observed in North Kanara District. About 14 per cent of the active fishermen engaged in rampant operation were thrown out of employment during 1978-79 as compared to 1977-78. The average annual revenue received by a rampant unit declined from ₹2.7 Lakhs in 1977 to ₹13,000 in the first half of 1979, But in North Kanara District, the earnings from rampant remained more or less same because only a limited number of purse seiners were operating in the region. The annual per capita revenue of a rampant unit declined from about ₹3370 in
1977 to ₹300-400 in 1979 i.e. one-eighth of the Income received earlier. A reduction of employment in rampani units was observed from 6000 (in 75 units) in 1979 to 2400 (in 30 units) in 1979. Hence, the Introduction of commercial purse seiners has adversely affected the traditional rampant operation. In Sakthikulangara and Neendakara of Kerala, the proportion of kutcha houses had decreased from 44 percent in Sakthikulangara and 29 percent in Neendakara in 1954 to 16 percent in both the places in 1980. The proportion of pucca houses and mansions had increased from 9 percent to 5.1 percent in Sakthikulangara and 6 percent to 20 percent in Neendakara. There had been a three and half times increase in the employment opportunities in fishing and fishery activities. The number of non-mechanised crafts had declined from 493 in 1953 to 214 in 1980 and the number of mechanised boats had increased from 138 in 1963 to 336 in 1980. There had been a considerable improvement in infrastructural facilities with the expansion of ice production capacity from 25 tonnes to 350 tonnes and freezing capacity per day from 9 tonnes to 75 tonnes between 1963 and 1980. The income had increased from ₹624 in 1954 to ₹4975 in 1980 showing an eight fold increase. The benefits of mechanised fishing were found to be more in Sakthlkularigara than in Neendakara, because of the concentration of developmental activities at the former.

In a study about the Status and Problems of Fishermen in the Marine Fishing Industry the authors point out that over-fishing threatens the fishery resources of our country and therefore regulation of a type, leading to a reduction in the number of units is desirable to conserve valuable resource to forestall economic difficulties and to reduce the clashes among different groups is desirable. Although advances have been made in fishing technology, practically it has not reached the poor fishermen. Several factors such as low social status, poor economic conditions, illiteracy, heavy interference of middlemen, traditional fishing equipments and methods etc. influence the socioeconomic conditions of fishermen (Nammalwar P., 1979).
A study on the coastal rural indebtedness in Vizhinjam, south of Trivandrum, Kerala found that the fishermen of the coastal villages borrow year after year and they are heavily indebted. But they are not in a position to repay the loan, either because the loans are larger or the income is not enough to pay off the debts. As such, the debt of the fishermen goes on increasing. This may be termed as coastal rural indebtedness. The fishermen of Vizhinjam borrow mainly from the moneylenders since institutional credit is not available to them. There are two types of moneylenders, namely, the moneylenders who combine fish trading with money lending and professional moneylenders. These moneylenders usually charge high rate of interests, often 30 per cent and more. They don’t keep proper accounts of repayment. They do not issue receipts for repayments. The boat owners also lend to the fishermen. In this system, for getting a loan, the fishermen as a wage earner has to enter into a contract with the boat owner that he should work only in the boat of the owner from whom he has received the loan till it is repaid. Maximum amount of loan is spent for household expenditures or for construction or repairing of the houses. The extent of indebtedness is higher among higher income groups and lowers among the lower income groups considering all these facts, the author suggests that Rural Banks and Co-operative Societies should be established to perform the activities of moneylenders and they should be regulated and interest rates must be limited to a reasonable level (Panikkar K.K.P., 1980).

A study on the impact of the introduction of mechanised boats on the socio-economic conditions of traditional fishermen conducted in Calicut region found that the Agricultural Refinance Development Corporation (ARDC) had supplied 50 mechanised boats of size 36 inches so that each boat was allotted to seven fishermen families, thus involving 350 fishermen families in this venture. The study indicates an improvement in the economic condition of the fishermen families of Puthiangadi (near Calicut) which received credit facilities from ARDC. The introduction of
mechanisation induced many fishermen to shift from traditional to mechanised fishing which resulted in increased landings and created more employment opportunities in net making, ice-plant and workshop operations, sorting, auctioning, transporting and fish trading. The absence of such economic activities in the neighbouring Elathur village is a pointer to the significance of availability of credit facilities to invest in improved fishing techniques (Panikkar K.K.P. and Alagaraja, 1981).

The living conditions on the whole of fishermen are deplorable. Owing to lack of economic development in the region of Maharashtra, there is continuous exodus of labour from the coastal region. As a result, the females have to bear most of the burden of economic activity. Indebtedness of the fishermen community is widespread. Necessary infrastructure by way of communication and transport facilities, water supply and power should have to be provided on priority basis. This creates scope for setting up agro-based and fisheries-based industries (Kalawar A.G., 1981).

There are two reasons for the poverty of fishermen, namely the inequality in the asset holdings among them and secondly the exploitation of all of them by those who are involved in the process of buying what they produce. As a result for the average traditional fishermen, saving from his income for investment is a painful task. Indebtedness among the fisher folk is high. Credit in the form of wage advances is a very common phenomenon in traditional fishing communities. Credit of other forms may be obtained by pledging ration cards, gold and fishing nets with individuals in the village who are not necessarily concerned with fishing. Rate of interest on mortgage of their products ranges between 24 and 60 per cent. Fish merchants are a source of big credit. They normally lend large amounts to fishermen who own fishing equipments (Kurien J., 1981).

For improving the socioeconomic conditions of fishermen at all fishing centre, sufficient cold storage and ice plants facilities must be provided to prevent fish from going waste. Internal market facilities must be developed with suitable transport
facilities. Every fishing village should be provided with suitable road facilities with adequate feeder roads linking every fishing centre. Fishermen should be educated sufficiently to preserve fish at the catching point itself. Modern fish processing units must be established in all the important fishing centres along with State fisheries units. Fishermen in the coastal area should be provided with proper sanitation and medical facilities, drinking water, wells and electricity. All important minor ports must be given top priority for berthing facilities and processing units with freezer-cum-ice plants for the use of small fishermen. Alternate jobs during off-season should be provided to the fishermen and their womenfolk (Fernando, 1981).

A study on the socio-economic conditions of fishermen in Poonthura, Kerala shows that fishing is a seasonal occupation, majority of the fishermen are actively employed for a period of 6 months in a year. Their equipments are not usable beyond a certain depth. 10 per cent of them have access to boats and nets, the other 90 per cent remain idle for a substantial part of the year. Underemployment is a major problem in the area. The scanty income and the numerous demands upon it, keep the fishermen in a permanent state of bondage to the moneylenders. The interest rate varies from 36 per cent to 120 per cent. In short, the rebuilding of the life of the fishermen group is a national challenge. Along with economic measures, there should go a systematic and effective educational campaign (Paul Valiakandathil, 1981).

A study on Marine Fishing Industry in Thanjavur district has discussed the distribution of income, indebtedness and the annual average return per craft of both the mechanised and non-mechanised sectors. The study revealed that the distribution of income in the worker groups in both the sector was more equitable than in the owner-worker groups and also revealed that workers in the mechanised sector could get a higher income than a owner worker in the catamaran sector. The author stressed the need to improve the efficiency of catamarans by suitably modifying the traditional craft. The study identified that the annual net return per craft in catamaran sector was
more than that of the mechanised sector. The low return per craft in the mechanised
sector was mainly due to the high cost of diesel and oil (Durairaj, 1981).

A study on the impact of mechanised fishing in the last two decades on the
living conditions of the people of Sakthikulangara and Neendakara of Kerala has been
manifold. One of the major benefits is the increased employment opportunity. There is
a reduction in the number of indigenous boats in the area. At the same time there has
been significant increase in the infrastructure facilities also. The process of
mechanisation has a great impact on the total landing of fish and prawns in that area.
This has resulted in better exploitation of resources. The export of marine products has
also increased. There has been an eight-fold increase in income since 1954. But the
financial position of the lower income groups could not permit them either to purchase
mechanised boats or to invest huge amount of money on fishery related activities.
Development of small-scale industries like coir-making and net-making which have a
good scope in this area enable these people to be gainfully employed during off-

A study on the economics of various types of fishing crafts used in Tamilnadu
revealed that the return per unit investment of non-powered boats was estimated to be
twice that of powered boats. For the traditional fishing crafts categories, it was
suggested that additional income and employment be obtained by making all fishing
requisites mainly fishing nets, fish processing, transport, marketing and use of catch to
raise the village poultry units (Srinivasan, 1981)

An article on the evaluation of fishermen economy in Maharashtra and Gujarat
had studied the general socio-economic conditions of fishermen in these two states
which analysed the literacy, size of family, number of earning members, number of
annual fishing days, households income, expenditure and saving pattern (Sehara,
1983).
Balakrishnan and Alagaraja has examined the reasons for the clashes between the mechanised boat owners and the indigenous craft owners leading to heavy damages in the year 1978 in the coast areas from Jagathapattinam in Pudukkottai District to Mallipattinam in Thanjavur district. It was suggested that the forming of Peace Council comprising of the local R.D.O. as Chairman and representatives from State Fisheries Department, mechanised boat owners and indigenous craft owners as members worked satisfactorily to end the clashes. The Peace Council drew schedule of restricted fishing for mechanised boats for three days in a week and traditional boats for four days were strictly kept up by the respective boat owners without any violation, while all the types of boats operate during day time. Since the system of regulated fishing works satisfactorily, the same may be extended to other regions where the clashes between these two sectors exist (Balakrishnan, 1984).

In a study on cost and returns estimated costs and returns in different fishing units. The study also included economic efficiency of fishing in the selected fish landing centres of the erstwhile Thoothukudi district. The study fitted a linear multiple regression function to find out the determinants of net income in fishing (Samuel, 1986).

Among the fisher folks 38.33 percent belonged to middle age group, 48.33 percent belonged to old age group and among the trawler owners most of them belonged to middle (43.33 Percent) and old age (35.00 Percent) groups (N.V.Sujathkumar, 1988).

Pollnac points out that in many communities, women take over the function of buying and selling fish. Sometimes, they are only involved at the primary level- the initial buying from the fishermen. In some areas they deal with the fish at all levels including retailing and processing. These middle women are found throughout the world in regions as widely spread as the Caribbean, West Africa, India, Asia, the Pacific, and Latin America. This division of labour can function to keep more of the
profit within the family-the men fish and their female relatives sell the product. The female role of fish trader results in their being the primary element of economic stability in some fishing societies (e.g., Ghana, Christiansen 1982). The men folk fish intermittently while females work year-round. Women are frequently at disadvantage with respect to decision-making powers in fishing communities inspite of their significant contribution. Organization of women into associations or cooperatives facilitated their participation in the development process. The role of women must be included in Organizational Development Plans (Pollnac, 1988).

According to Nauen fisherwomen have a dominant role to play in the post-harvest sector. From landing the fish to processing and selling in the market, women are often in charge. They may clean and salt-dry bigger species including shark. Women and youths also play an important role in production. The Nigerian fisherwomen in the village Gabon for example go fishing. The capture and collection of seafood in canals, mangroves, small ponds, fish holes etc. for the family or trade is a familiar practice in most places. Still females often suffer lower social status than males and on the average have inferior access to food, formal education and health care (Cornelia E. Nauen, 1989).

Selvaraj in his study has identified the fishing seasons for important species of fish groups and estimated the economics of different craft categories in the selected coastal fishing villages of Kanyakumari District of Tamilnadu. He formulated suitable strategies for the development of fisheries sector for the betterment of fisher folk in the district (Selvaraj.P., 1988).

Srinath Krishna made a study on the food consumption pattern and nutritional status of a marine fishermen community in Vypeenkara, Cochin during the year 1982-83. She conducted a survey by selecting 150 households and the particulars regarding total quantity of food bought every week and the frequency of consumption were collected through interview schedule. She concluded that the major problems
encountered in the development of fishermen community has been their low nutrient intake. The high incidence of malnutrition of this particular community mainly attributed to two factors namely low purchasing power and non-availability of protective foods like leafy and other vegetables in the coastal areas. Lack of alternative sources of protein mainly results from low purchasing power. She suggested that the most important step in the upliftment of the community is to increase the purchasing power by increasing the income from fisheries and introducing supplementary occupations, so that at least the requirements for protein and calories are met (Krishna, 1988).

Samuel points out that the study of the socio-economic conditions of fisher folk especially fishermen have been neglected by sociologists and economists. The fishermen have a very low status in the social hierarchy, which leaves them worse off than their counterparts despite the fact, that the involvement of the fishermen in the industry is considerable. But their role stands unrecognised. In a survey conducted in Tirunelveli district by the author, it was found that the extent of literacy among fishermen ranged from 65 per cent in catamaran motorised unit to 37.19 per cent in mechanised unit. Being illiterate and have no other opportunity to work, the fishermen of artisanal unit help their men folk in fish marketing and related sundry activities. More than 90 per cent of fishermen in the artisanal fishermen families possess skills in net making and fish processing. It is interesting to find that there is practically no involvement of fishermen belonging to the mechanised unit in decision-making of economic activities but fishermen of artisanal units are involved in decision-making of economic activities to some degree (Samuel 1989).

James in his article titled "Marine fisheries not fully tapped" had analysed, the total marine potential and the average production in the mechanised and traditional sector. He had found that the coastal areas had been more or less fished at optimum level. However, the potential in offshore and deep sea fishing had not been fully
tapped. He had suggested for joint ventures with countries having expertise and experience in high sea fishing for tapping the vast off-shore and deep sea fishing resources (James, 1990).

Sathiadas et al., have collected information relating to housing pattern, ownership of means of production, employment status, occupation, annual income, indebtedness, marketing problems etc. of fisher folks. The study reveals that catamaran is the lone craft operating in that area. Chalavalai alone accounts for the major investment on gears. The major source of income comes from active fishing. The main source of borrowing is the moneylenders. Easy availability of credit through institutional agencies, opportunities for supplementary occupations and better infrastructural facilities for marketing are some of the suggestions given for the economic improvement of traditional fishermen (Sathiadas R. P., 1991).

Vedavyasa Rao and Sriramachandra Murthy have elaborately discussed about various controversies and complexities in management of inshore fishery resources of India. They concluded that none of the management measures adopted in the country can be considered as successful. Taking into various complexities of issues in management of fishery resources such as heavy fishing pressure in the inshore fisheries of the country, its impact on sustainability of resource and deepening conflicts among the resources users, they put-forth the following suggestions in policy making: (a) provide increased role to the local or regional fishing communities in the formulation of regulatory measures and their managerial responsibility; (b) ensure positive access in favour of local fishing communities; (c) formulate regulatory measures with a strong conservation policy through careful regulation of fishing effort and restrictions on gears; and (d) incorporate a system of fishing zones within the regional management scheme transmuting the conflict to co-existence or even symbiosis (Vedavyasa Rao, 1993).
A study revealed that most of the beneficiaries of the Fish Farmers Development Agency (FFDA) of Tamilnadu were under young age category (63.00 Percent) followed by middle (26.00 Percent) and old age (11.00 Percent) categories (G. Perumal, 1992).

Ayyakkannu made a comparative analysis of the socio-economic life of the fishermen in Vethalai of Mandapam block and Thiresapuram of Thoothukudi. Fishermen in Vethalai go for fishing for at least fifteen days in a month. The most favourable season is the post monsoon period during which diving activity also goes on. Most of them used lobster nets. In Thiresapuram, shingi valai is the main gear used by the fishermen. February-April is the months good for diving. May to July months are good for net operation. Another interesting point is that there is a co-operative society in Vethalai village. Apart from this unit, 300 of the fishermen are members of the Mandapam fishermen co-operative society. But there is no co-operative society in Thiresapuram and fishermen of this village buy fishing equipments and spare parts from private shops (Ayyakannu, 1992).

Nuruddin analysed the socio-economic conditions of fisher folk in Kuala Sepetang, a coastal village in the west coast of peninsular in Malaysia. This village has all the public amenities like transport, sanitation, telephones, drinking water etc. The illiteracy rate is low. Fishing is the primary income generating activity in the village. Majority of the fishing households are vessel-owners and they are mainly involved in shrimp trawling. About 29 per cent of the total households are involved in fishery-related activities excluding active fishery which includes aquaculture, fish trading, marketing and processing. No men folk are actively involved in fish processing. It is interesting to see that nearly all fishing households in the area are above the poverty line. Less than one per cent of the households in the area are living below the poverty line and all of them are non-fishing households with one working member. (Nuruddin Adnam, 1994)
Nandeesha et al., points out that in Cambodia, women make up more than 65 per cent of the adult population. They play an important role in all spheres of social and economic activities. In small-scale aquaculture, women have been found to contribute more than men in almost all activities. Most of the housewives play a major role in fish culture and the success rate and maintenance of data are better wherever there is any involvement of the housewives. In almost all cases, the wives of the fishermen manage ponds. Daily harvest of fish for family consumption is also done by the female members with the help of children. As fish culture is fairly less labour-intensive and more recreational, day-to-day management can be done better by women than by men. Further, fish culture is less risky than rice and pig cultivation, in terms of return on investment, provided adequate care is exercised from the beginning to the end of the culture period (Nandeesha, 1994).

In India development of fishermen is often restricted to the traditional fishing communities near the coastal areas in maritime states while the interest of those associated with inland fishery is relatively neglected. The frequency or regularity of fish catch, its volume and yield of profit from an aquaculture enterprise, efficiency in management, the involvement of the members in the cooperative/group in the management pattern of an aquaculture pond are likely to have a bearing on the socio-economic status of the fishermen who are primarily engaged in catching fish from the concerned ponds. Disparity in the standard of living, differential access to income earning capacity and other perquisites are likely to give rise to the growth of discontent amongst the relatively indigent fishermen, thus partially weakening their urge to wholeheartedly participate in the activity of fishing (Boyce, 1994).

Siddiqui compared the socio-economic conditions of fishermen in Tamil Nadu and Orissa. The main livelihood of fishermen wholly depends on the catch of fish from fishing and marketing. Fishing season starts from August and continues up to March. Fishing is generally not undertaken for about 60 days in a year when the sea is
rough or due to cyclonic weather. On the other hand mechanised fishing vessel owners are able to carry out their normal operations during the off-season also. The funds rose for the purchase of traditional craft or mechanised vessels are partly from their own sources and partly through money lenders. They are hesitant to avail bank finances because of the conditions of repayment of loans and lots of formalities they have to undergo. About 70 per cent of the persons interviewed were indebted for meeting their day to-day maintenance in time of poor catch or poor marketing, marriage expenses etc. The fish merchants or moneylenders are the source for providing loans at a higher rate of interest of 36 per cent. In the light of the above conditions, it is suggested that the fishermen should be motivated for undergoing training so that bank loans are availed by them for the purchase of fishing crafts or gears. Efforts should be made to provide basic infrastructural facilities like pucca road, drinking water supply, sanitation facilities, medical and school facilities (Siddiqui, 1995).

A socio-economic survey conducted for the Development and Educational Communication Unit (DECU) of Space Application Centre (SAC), Ahmedabad during 1995 in the two brackish water sites. Kodungallur and Mulavugadu in Kerala identified by the Indian Space Research Organisation (ISRO), using satellite imageries to study the feasibility of establishing aquaculture farms on a cooperative basis indicated a high literacy rate of 85-90Percent. Mulavugadu had a high proportion of young and middle age group populace which is said to be conducive for adoption of any technology. Fishing was the major occupation and about 70Percent of the sample respondents were dwelling in kutcha houses in both the selected sites. Most of the sample respondents (90Percent in Kodungallur and 83Percent in Mulavugadu) owned a land area of less than 25 cents. There was a significant difference in income levels between the fishermen of the two sites. In Kodungallur 62Percent of the households earned an annual Income below ₹ 25000 whereas in Mulavugadu 85Percent got an annual Income in the range of ₹25000 - 50000. This high level of income offish
farmers in Mulavugadu might be due to their proximity to Cochin city which offers adequate job opportunities, substantial number of fishermen practicing traditional prawn farming and good remuneration obtained from brackish water fish farming. The respondents expressed their willingness to form brackish water fisheries cooperatives to undertake this proposed scheme.

Devaraj et. al., has evaluated the growth of fishing industry in the east coast of India which consists of the coastal states of West Bengal, Orissa, Andhra Pradesh, Tamil Nadu and Pondicherry. They came to the conclusion that during the past three decades the availability of fishing area has been increased; the number of mechanised vessels increased by about 10 times from 1,228 in 1961 to 12,223 in 1991; the marine fish production in the east coast increased by 3.4 times i.e. the average landings increased from 1,87,000 tonnes in 1960-64 to 6,34,252 tonnes in 1990-94; the annual average yield during 1990-94 was 42.3 per cent of the potential yield and there is a production gap of 57.7 per cent. Their view was that the inshore area (less than 50 m depth) is intensively exploited and there is considerable scope for intensifying the effort in the offshore area (more than 50 m depth) (Devaraj, 1996).

Jacob Jerold Joel and Ebenezer made a study on present status of trawl fishery at Colachel for a period of five years from 1990 to 1994. The study indicated that the annual average gross income per fishing trip worked out to a minimum of `8,121 in 1990 to a maximum of `22,683 in 1994. Therefore, it was found that trawl fishing at Colachel was more productive and profitable (Jacob, 1996).

A study in Kerala stated that 52.67 percent of the fishermen belonged to middle age group followed by old age group (27.33Percent) and young (20.00Percent) age group (Immanuel, 1997).

Tewari, et.al., described the findings of a macro-level study and a participatory appraisal study of demographic characteristics of fishing communities in India, carried
out in the context of the project "Strengthening of research and training in population and development dynamics of rural fishing communities". The marine fishing fleet, marine fisher-folk population, marine fish production, coastal environmental problems, and perceptions and views of the fisher-folk are outlined. Findings indicate that production has increased along with the increase in the number of fishermen and boats. However, overexploitation, deterioration in environment quality, fall in catch per unit effort, high price of fuel and equipment, and high labour and service charges are detrimental to the rate of growth of fisheries. It is concluded that proper management of resources and judicious exploitation are necessary (Tewari, 1997).

Chidambaram et al., have studied marine fish supplies in Tiruchendur area. They have described fishing operations, financial requirements, and profitability in fishing and production problems encountered by the fishermen. They have also given policy suggestions for the development of the fishermen (Chidambaram K., 1997).

Girija et al., stated that in India, the development plans for marine fisheries lay emphasis on improving the lot of marginal fishermen. A concerted effort to coordinate fishing would improve the subsidiary activities of fishermen household, by tapping the fishermen to process and market a substantial portion of the fish landed and also would definitely go a long way in improving the socio-economic conditions of this sector. The post harvest technology for handling fish can be easily transferred to these beneficiaries. Infrastructural support by way of cold storages, processing space, transportation network and sales outlets are to be created. Capital input and technological support should be provided. By expanding the co-operative set-up now existing in the marine fish harvest sector in Kerala by involving the potential work force of fishermen, the apex body of the cooperatives will be able to penetrate export trade by properly coordinating the production at different work centres in addition to emerging as a major player in the domestic fish trade (Nair, 1998).
D'cruz studied that co-operative had been recognised as an important institution for the socio economic upliftment of fisher-folk in Kerala. But the historical background shows failure since 1917. Matsyafed formed in the year 1984. After a decade, the co-operative umbrella of Matsyafed comprises 292 primary co-operative societies with an average membership of 502, covers about 75 per cent of active fishermen of the state. On an average 12.5 per cent active fishermen of the State were provided soft loan assistance for acquiring means of production through Integrated Fisheries Development Project (IFDP). The beneficiaries repaid 77 per cent of the loan amount of the first two phases. The fish auctioned through the primary co-operatives over the years was only one per cent of the State's marine fish landings, need attention for further improvement. The improving trend of performance indicators of IFDP and the attempt for resource mobilisation of ₹210 Crores² under IFDP phase IV for the period 1996-2002 are expected to provide impetus for the take off in the co-operativisation processes of Matsyafed. If future course of action is not set in the right direction, catastrophe cannot be avoided (D'cruz, 1998).

Shanmugaraj et al., in a project with an aim to find out the Socio-Economic Status of the Fisher folk Communities of the Gulf of Mannar Marine Biosphere Reserve, point out that there are 49 villages along the coast, of which 38 are in Ramanathapuram district and 11 are in Thoothukudi district bordering the marine biosphere area. The fishermen from these villages depend solely on fishing for their livelihood. The fishermen are well trained in sorting fish, cleaning, drying and marketing them. They also act as agents for the boat owners at auction centers and earn a good commission. The fisherman's daily income depends upon his day's catch, which is not regular, and at a steady level. It ranges from "100-200 a day in the peak

² One Crore is equal to 10 Millions
season and "20-30 in normal days. The fishermen market their catch either individually or through their association or through agents. Normally, the fishes are auctioned at the landing centres. The community of the biosphere area feels that with the support of the government agencies, better decisions can be made on planning, allocation of area within the Gulf of Mannar for certain uses, fishing gears etc. The government should provide economic and other infrastructure facilities through society or village level organisations to improve their livelihood (Shanmugaraj, 1998).

Lilian Fay-Sauni explains the involvement of women in fisheries in the Pacific islands. Women are extensively involved in many types of fishing activities in the Pacific islands. These activities range from collection of reef invertebrates to fish, to the processing and marketing of fish and fishery products. Up until lately, their role in fisheries in their countries have been underestimated and overlooked mainly due to the fact that fisheries are commonly known to be "mens". The fishing activities of women are mainly confined to shallower, in shore and reef areas even though some do have accessibility to fish offshore using motorised crafts and canoes. Substantial changes over time in the role of women in fisheries development differ from country to country in the region. Understanding such changes, particularly in relation to other commitments provide a sound basis to understanding the consequences of women's participation and timely contribution in managing marine resources where it deems necessary (Lilian Fay- Sauni, 1998).

Veenakumari explains the socio-economic status of women in India. The status of women is intimately connected with their economic position, which depends upon the opportunities for participation in economic activities. The economic status of women is now accepted as an indicator of the society's stage of development. Overwhelming majority of women are engaged in the informal sector, which not only provides low return but also is characterised by return in accessibilities to credit, technology, training and other facilities. Women have still not been recognised as
producers of their own right. Moreover the traditional economic activities which provide employment to women have suffered in the competition with the more advanced technologies. There are about 30 per cent rural households headed by women who bear all the burden of earning and caring for the families and suffer on account of lack of access to means of production and ownership of land and other property. In spite of the initiatives taken during the last four and a half decades of planning process in India, women still face some limitations and apparent handicaps and constraints due to the lack of education, health, nutrition, information, transportation and other factors. There is still discrimination against women and they have yet to be integrated in the development process of the country. In this regard, it can be highlighted that separate economic planning for women within the overall planning system can be advocated. Attention should be paid to find a way by which women can be integrated in the development process and to see what kind of resources need to be allocated (Veenakumari, 1998).

Verduijn, on behalf of the BOBP, had conducted a survey in Kanyakumari district to find the basic needs of 39 coastal fishing communities, which inhabit the 68 km stretch of the coast. This study revealed that over the years, the intensity of fishing has increased partly on account of the increase in the active fishing population, partly due to the lack of alternative income generating opportunities and partly due to motorisation and mechanisation of fishing crafts. The resource has not kept up with the increase of effort, which results in a sharp reduction in catch per unit effort. Since the usage of mechanisation in 1958, artisanal fishers have with dismay compared the landings of the mechanised crafts with their own meager catches. Besides, the artisanal fishers have often seen their nets destroyed by mechanised boats. With this background, the survey points out that the major problem as given by respondents is the non-availability of safe drinking water followed by sanitation and health care (Verduijn, 2000).
Narayananakumar et al., have studied the Socio-Economic Conditions of Marine Fisherwomen in India. The changes that have been brought about by the mechanisation of fishing industry in terms of income and employment generation and investment on fishing equipments have been discussed. The marine fisherwomen in India, in general are socially and economically backward. Hence, any innovation in marine fisheries including new technologies besides increasing the yield from capture and culture sector should be economically and technically efficient and socially acceptable. Any sort of technological innovation, financial scheme or management practice needs to be analysed to assess its socio-economic, environmental and ecological impact such as family size, age structure, employment potentials, education and living standards of fishermen and this will help identify the constraints obstructing the realisation of full potential of development schemes and adoption of new technologies (Narayananakumar, 2000).

Lone Grønbæk states that Game theory is an analytical tool for modeling strategic interaction between agents. Strategic interaction in fishery is interpreted as the harvest by one agent highly affects other agents’ decision. This paper is a commented literature study on the fishery economics and game theory. It tends to describe how fishery models using game theory are built up. These models consist of underlying biological models and the game-theoretical computational concepts. The paper then describes different types of fishery and how these types are related to game theory. Special features as externalities and irreversible capital are discussed. The paper then presents two classic models of fishery economics using game theory. Two newer papers using game theory are discussed. Finally, the paper concludes with ideas for further research (Grønbæk, December 2000).

Balasubramaniyan in his study compared the economic status of fishermen in two marine fishing villages of Orissa State viz., Pentakota and Belinoliasahi. They measured the economic status and the mean scores of respondents in the two villages,
which differed significantly at one per cent level. The results also revealed that the fishermen had a favorable attitude towards the motorization of fishing crafts in both the villages (Balasubramanian, 2001).

Deaton argues that a socioeconomic gradient is a useless concept for thinking about policy, as there are no policy instruments that simultaneously act upon income, education, and social class (Deaton, 2002). However, income, education, and social class are all proxy factors for an underlying global construct – the relative position of a family or individual on a hierarchical social structure and that the composite is useful for gaining an understanding of the underlying causal processes. Because of the pervasive effect of Socio Economic Status on a wide range of factors, it is useful to be able to compare Socio Economic Status gradients for various outcomes, across communities and over time. As a policy instrument, it has proven to be a useful device for communicating the extent of inequalities in a society.

Ragupathy Venkatachalam in his article examined the threat to the substantiality of the fisheries in India and in particular of the Gulf of Mannar region. It is widely quoted that the depletion is due to the introduction of trawler fishing techniques, which scrape the bottom of the sea and end up catching juvenile fish. In viewing this problem of over fishing (by the trawlers) as a negative externality to the traditional fishing community, the best way to internalize the social cost inflicted by the people who over fish is the question that this study attempts to seek the answer for. One of the most commonly practiced techniques to sustain the fisheries resource is the blanket ban on fishing during specific months of the year like the one practiced in the coastal regions in India. The researcher has attempted to critically evaluate the effectiveness of this method of resource conservation. The researcher has also proposed an alternative model for sustaining the resources, which would be an effective solution for the problem (Ragupathy Venkatachalam., 2005).
Gupta in his work on "Challenges in sustaining and increasing fish production to combat Hunger and poverty in Asia" has concluded that while there are ample opportunities for fish and fisheries to make a major contribution to food and nutritional security and eradication of the poverty, the number of challenges that need to be addressed, through fulfilling the requirements of fisher folks apart from the political will, policy change and effective and efficient implementation of various schemes is inevitable. Our fight against hunger is a long process agitation and it needs patients, endurance and great commitment (Gupta, 2006).

A study has been conducted in all the major coastal states and some selected inland states to understand the domestic marketing of fish in India. The total marketing costs of auctioneer, wholesaler, retailer, vendor, marine fishermen cooperative society and contractor/freshwater fishermen cooperative society have been found to be "0.98, "8.89, "6.61, "4.50, "6.00 and "3.51, respectively. The marketing efficiencies for Indian major carps (IMC) sardine and seer fish have been found to vary from 34 per cent to 74 per cent depending on the length of market channel. The marketing efficiency has been found more in the case of marine species than freshwater species, since the latter travel longer distances from the point of production to consumption centre, passing many intermediaries as compared to the former. The fisherman's share in consumer's rupee has shown variations across species, marketing channels and markets. The infrastructure facilities at most of the surveyed landing centres, fishing harbours and wholesale and retail markets have been found grossly inadequate and poorly maintained. The study has highlighted the need for formulating a uniform market policy for fishes for easy operation and regulation, so that the country's fish production is efficiently managed and delivered to the consuming
population, ensuring at the same time remunerative prices to the fishers (Ganesh Kumar, 2008).

A study on technology development, efficiency and socio personal characteristics of researchers in marine fisheries reported that 52.78 percent of the fishermen belonged to middle aged group followed by 40.28 percent in old age group and 6.9 percent in the young age group (J. Charles, 2009).

Nirmal Chandra et al., in their articles remarked that the fisherwomen of Gopalpur have a vibrant organisation called 'Kalinga Fish Workers Union' that fights for their rights. The women also assert their rights through self help groups (SHGs) and through participation in the Panchayat. The girl children are now sent to school. Women in the area with the help of the local NGOs began to protest against child marriages and child labour. They have also fought against illegal taxes. The economic contribution of fisherwomen to their families is quite significant. The income of the fisherwomen is mainly determined by the amount of time allocated to collection, processing and marketing of fish. The age, body weight, marital, maternity status and education do not significantly influence their income. They spend bulk of their time on fishery and household activities. There is no scope for leisure and pleasure. They are being exploited by the middlemen and traders belonging to their own community and others. The fisherwomen are aware of the conditions of sustainability such as diversity, alternative sources of income, community harmony and familial equilibrium. Their traditional ecological knowledge (tek) needs documentation, recognition and appreciation. The natural fishery capital stock in the sea and land resources in the coast needs protection. The fisher people's council should be recognised as a socio-political institution (Nirmal Chandra Sahu, 2009).
A study on the various problems of the fisherwomen viz. sex ration age groups, professions, employment, marketing, income, indebtedness, education, residence, water supplies, health care etc. were analysed. The analysis is based on a field visit, case study and at the same time to collect information through open-end questionnaire survey amongst 360 fisherwomen from three villages from coastal areas of Orissa, which is one of the poor states of India. Using the open end question and interview with fisherwomen, social- cultural life of fisher women was investigated. It is seen that men take over women’s work as production has changed from subsistence to the market economy. From the study it is inferred that the fisher women is changing though the process of change is slow. However, during the last decade, the pace of change has increased and it is expected to continue with significant implications for the fisher women society. The preceding discussion makes two things clear. The fisher women are changing though the process of change is slow. The change is more marked and substantive among fisher women girls than among middle age and elderly women. This research has addressed the research question as to what development goals have been achieved in India to date. One way to summarize an answer to this question by listing of five types of ‘development freedoms’ which he regards as important in going beyond simplistic development measures such as gross national product (Susmita Pataik, 2011).

Fishers’ socio-economic and cultural profile around the Loktak lake of Manipur had reported that (44Percent) of the fishermen were more than 46 years old belonging to the old age group (N.B.L. Devi, 2012a).

The study related to the socio – economic condition of the fisher community of Chandakhola wetland of Dhubri District, Assam, India showed that a very miserable condition of fishermen. The literacy among the fishermen is very poor. Among the literates, none has been found to have education above the X standard. Their families represent both extended and nuclear type. Statistically the family size is independent
of family type. Of the capable family members 53\% are adhering to fishing and the rest opts for other ways of livelihood (Samuel Sheikh, 2013).

One of the harsh realities of the 21st century is the existence of a persistence gap between the wages of men and women around the world. Wage difference on gender basis has been a great global concern for over a century now. Yet progress made to check the problem has been very slow. Even advanced industrialized countries like United States and Western Europe are struggling and fighting very hard to achieve a fair wage balance between men and women workers. But, when it comes to case of developing countries like ours i.e. India, the wage disparities on the basis of gender is far more striking. Among the BRIC (Brazil, Russia, India, and China) economies India ranks lowest on gender parity, this includes pay parity (i.e. difference between wages of men and women). This fact was revealed in the Global Gender Gap Report of 2010. The recent survey by the World Economic Forum (WEF) point out the Indian situation, ranking India among the bottom 10 countries in the world in terms of women’s participation in the economy. The WEF report exposed a very a shocking result regarding the disparity in wages between men and women in corporate India. The average annual income of a woman engaged in cooperate sector in India is US$ 1,185, where as that of her male counterpart is US$ 3,698. This clearly brings out the fact that an average woman’s is paid less than one-third of the average man’s pay in India. The WEF report further bring out in terms of “economic participation and opportunity” for women, India has fared worse than last year, pushing the country among the bottom 10 countries on the WEF list. Overall, in terms of gender equality India achieves a score of 59.4\% but in terms of economic participation and
opportunity, it scores 39.8\% which is very dismal. India’s general participation of women in the workforce stands at 36\%, where as for professional and technical workers, the figure is 21\%. As per the report of the Annual Survey of Industries for the year 2004-05, the gender wage gap for regular workers in the formal was 57\%, where as for casual workers in the formal sector it is 35-37\%. In agriculture sector, where the women participation rate is more than estimated 60\%, the hourly wage rates of women in 50 to 75\% of male rates. The discrimination and biases against women witnessed in social spheres gets mirrored on to economic spaces not only through direct, legitimate routes but also via the resilience in perceptions and mindsets among the agents of the labour markets that reconfigure to retain elements of gender imbalances (Shayan Javeed, 2013).

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
in 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 (John, 2014).

Fishermen contribute a lot in our economy. So improvement of their social-economic condition is very important in context of our national economic development and for that proper management is needed for the fisheries and proper training should also be given to the fishermen. Education plays a vital role in changing the life of the fishermen. If proper education is provided to them it should change their mindset of accepting the new technology of fishing and as the knowledge of the fishermen about technological knowhow is almost nil, hence proper literacy program should be implemented and general awareness program should be given from school level among the children of fisherman. Changes in financing policies are needed like easy accessible loan with low interest rate for the fishermen so that they would not further be exploited by the money lenders and the middle man. Proper facilities for cold storage should be provided to the fishermen. Necessary policy measures must be taken for organizing fishermen in appropriate organization to fetch good market price. Different fishing programs should be implemented by the fisheries department
because it would help in the development of fishing in the study area (Chakraborty, 2016).

2.3. Conclusion

The review of above empirical literatures revealed the importance of studying the socio-economic conditions of fisher folks as well as their existing status around the world. In order to explore the socio-economic status of people engaged in fisheries sector of India in detail, the following chapter discusses the fisheries sector in India and Tamilnadu.