5.1 Introduction
Livelihood is not only a group of activities that are carried out in order to earn income and access the food that individuals require for their sustenance. It is rather activities that are influenced by a complex set of factors which contributes to generate income or secure food supplies for an individual. Choice and strategies followed by people to ensure livelihood for their families and themselves need to be fully understood. To understand the livelihood of the fishermen of Chilika, it is important to know the level of dependence they have on the marine and coastal resources. Any analysis of livelihoods that focuses purely on the principal activities in which people are engaged in order to “make a living” will tend to ignore critical interactions that represent a fundamental aspect of people's livelihood. These exert very significant influences on what people do, why they do it and the “outcomes” of the livelihood strategies in which they are engaged. Livelihoods therefore need to be understood as dynamic, subject to shocks, changes and seasonal effects, particularly when they depend heavily on access to natural resources, as is often the case among people living in coastal areas. The dynamic nature of the coastal environment means that the ability of people to sustain their livelihoods in the face of shocks and changes is a major challenge in the coastal and marine areas.

The development of Indian fisheries over the last 50 years has resulted in the super imposition of a modern, capital-intensive, specialized technology on the existing traditional base, which originally was largely labour intensive and of great technical diversity. The result is that community-based, small-scale fishing has given way to production base on industrial principles of organization and complex technology in order to feed international markets. In sustainable livelihood terms, the fisheries sector in India developed largely on the principle of enhancing physical assets to maximize returns from the exploitation of natural assets. Any attention paid to the development of other assets, social, human or financial was in terms of enabling the acceptance of the physical assets. Thus the signs of fatigue in the natural resource base speak not only of the failure of the techno-centric model of development, but also of fishers' abilities to cope with this model.

It is the open-access or common property nature of the water-body that attracts large numbers of poor people to find their livelihoods, and they are badly affected when the terms of access to the resource change. Open access allows the entry of bigger players into the sector, who come to dominate or even monopolize access to resources often with the facilitation of the state and
marginalize traditional stakeholders. Development efforts have given rise to a hierarchy based on economic criteria in the villages. The diffusion of new technologies has benefited a few people, with the large majority becoming wage earners and several others becoming redundant. Changes in marketing patterns brought about a change in sharing patterns, transforming fishing crew from shareholders to employees, although they still retain a share in the catches. Modern systems have introduced a number of new players and reduced access to fish for many traditional users, including the producers.

Fisheries-related activities provide important sources of livelihoods for nearly 7 million people in India. (Government of India, 2000). A large percentage of fishers are involved in artisanal, small-scale fishing operations in open water bodies including the sea, rivers and creeks, as well as in fish trading, processing and related activities. Poverty in coastal areas often tends to be more relative than absolute and thus not always easily apparent, giving rise to the notion that coastal areas have fewer poor people than non-coastal areas. Based on the definition of poverty as the inability to secure a minimal standard of living (National Institute of Rural Development – NIRD, 1998: 5), the majority of coastal fishers can be defined as poor. In fact, the nature of their livelihoods and their living conditions make them one of the poorest and most marginalized groups in the country.

A majority of fishers are perpetually indebted. Borrowing during lean periods has come to constitute a livelihood strategy for many people. The single factor most responsible for the increasing levels of poverty, food insecurity and vulnerability in fishing communities is the steep decline in availability of fish in terms of quantity, quality and variety over the last decade. The seasonal availability of different varieties of fish has become uncertain. Increased population and market demand on the shore have resulted in the spreading of catches more thinly across a larger number of people and/or increasing prices to very high levels and thereby reducing access to fish.

Geographical and occupational migration by fishers in search of a livelihood is increasing, and much of this burden falls on women. With reduced earnings and increasing unemployment in the sector, more women are actively seeking employment elsewhere. The fishers’ choice of a new livelihood is not random, but is decided after a careful weighing of available options. But the problem of poor and unsustainable livelihoods persists and is growing rapidly, indicating that fishers are increasingly unable to find adequate solutions to their livelihood requirements. By making equity secondary to growth, fisheries policies have failed to foster and nurture the livelihoods of the poor. The geographical isolation of fishing communities has a strong bearing
on their poverty and vulnerability and is reflected in their limited access to infrastructure and
development assistance, poor transport and communication systems, alienation, extreme
poverty and vulnerability to natural disasters. In the fishing sector, poverty and food insecurity
are determined not so much by the prevalence of seasonal unemployment as by the ability of
different sectors of fishers to cope with it.

While a number of authors agree that dependency ratios, household size and geographic
variables are important correlates of poverty (Baulch and McCulloch, 1998), vulnerability is
more closely linked to the defenselessness, insecurity, and exposure to risk, shocks and stress,
and perhaps more than poverty is linked with net assets (Chambers, 1989). In this respect
personal assets, government support in creating livelihoods, fishers’s cooperatives, credit
structure, training and counseling facilities, all have a role to play in sustaining and maintaining
livelihoods. In addition, impact of Prawn Export, scientific way of storage of fish, insurance
coverage and fishers’s association can have a vital role in ensuring sustainable livelihood for
fishermen. The researcher has therefore tried to study each of these aspects through interviews
and getting deep into the life of fishermen and tried to provide social, economic and political
solutions, to ensure the legitimacy of changes for addressing the poverty gaps correlating them
with CPR, natural disaster and constant environmental degradations.

5.2 Livelihood Asset Structure
Assets are pre-requisite for maintaining the livelihoods of human beings. Assets in common
language mean anything that people own e.g. house, car, radio, cycles, the furniture. As per the
India Human Development Report 2010, household assets represented everything that was
owned by the household and had money value. Assets were broadly categorized as land,
buildings, livestock, agricultural machinery and hand implements, non-farm business equipment,
transport equipment, durable household goods, and financial assets (shares, dues receivable,
deposits, and the like). Assets were valued at the current market prices in their existing
conditions prevailing in the locality.

For the convenience of the study, the researcher has taken three kinds of assets, i.e. Land,
physical assets like motorbikes, television, sewing machines, etc. and animal assets.

Land use may be defined as the arrangements, activities and inputs people undertake in a
certain area to produce, change or maintain it. There is a growing concern over the degradation
of natural and agro-ecosystems in Chilika region. In this case, land use studies form the basis
for analyzing the causes which lead to degradation of agro-ecosystem outputs, or deterioration
of a natural ecosystem. More importantly, land use pattern also decides the economic status of
a family. Traditional belief is that, the person, who has more land is richer and the person with limited or no land were considered to be poor.

In terms of composition, land was by far the most important asset owned by rural households in India. As per India Human Development Report 2010, land along with buildings constituted more than 85 per cent of the total value of assets in rural India.

Interviews and discussions with local fishermen, who are also cultivating their lands were not only necessary for the collection of socioeconomic land use data, but was also very fruitful to understand the land use characterization from technical perspectives.

<table>
<thead>
<tr>
<th>Land type</th>
<th>Nil</th>
<th>&gt;0 dc to&lt;2 dc.</th>
<th>&gt;2 dc to&lt;4 dc.</th>
<th>&gt;4 dc to&lt;6 dc.</th>
<th>&gt;6 dc to&lt;8 dc.</th>
<th>&gt;8 dc to&lt;10 dc.</th>
<th>&gt;10 dc</th>
<th>Nos</th>
<th>%</th>
<th>Nos</th>
<th>%</th>
<th>Nos</th>
<th>%</th>
<th>Nos</th>
<th>%</th>
<th>Nos</th>
<th>%</th>
<th>Nos</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homestead land</td>
<td>37</td>
<td>8.2</td>
<td>111</td>
<td>24.7</td>
<td>50</td>
<td>11.1</td>
<td>44</td>
<td>9.8</td>
<td></td>
<td>53</td>
<td>11.8</td>
<td>28</td>
<td>6.2</td>
<td>127</td>
<td>28.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural land</td>
<td>298</td>
<td>66.2</td>
<td>8</td>
<td>1.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Land leased in</td>
<td>434</td>
<td>96.4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>16</td>
<td>3.6</td>
</tr>
<tr>
<td>Land leased out</td>
<td>437</td>
<td>97.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>13</td>
<td>2.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land operated otherwise</td>
<td>445</td>
<td>98.9</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>1.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The study reflects that 28% fishermen have more than 10 dc homestead land, whereas 25% have less than 2 dc of home stead land. Similarly 11.1% have 2 dc to 4 dc land, 9.8% have 4 dc to 6 dc land, 11.8% have 6 dc to 8 dc land and 6.2% have 8 dc to 10 dc homestead land. Only 8.2% have no homestead land at all. However 66% fishermen have no agriculture land, 2% have less than 2 dc agriculture lands, 1% has 4 to 6 dc land and 31% have more than 10 dc land. At the same time, only 3.6% have land leased in and 3% have land leased out. This means most of the fishermen have not either leased in or out. This portion of the study also reflects that only 1% respondents have lands which are used otherwise, including for setting up business.

The study therefore gives a mixed picture in terms of land holding pattern. While most of the fishermen do not have agriculture land, at least 31% have agriculture land more than 10 dc. This means this section of fishermen can make income out of agriculture.
Fishermen therefore need to be supported with technical support for farming. The fishermen who have smaller patch of land should also be supported for aquaculture. The main objective in promoting aquaculture should be to provide suitable alternatives to lake fishing. Like agriculture, aquaculture also presumes land ownership. Because land ownership is confined to a smaller percentage of people in fishing communities, the number of people who can become aquaculturists is limited. However, the potential for aquaculture to provide employment in some of the villages adjacent to Chilika is considerable.

It is evident that livelihood of the fishers in the Chilika area was adversely affected as a result of the spread of aquaculture in the area. Their efforts to stop development of a major aquaculture project proved successful, but aquaculture entered the area by other means. Aquaculture has not only affected the life and livelihoods of fishing communities but has also contributed extensively to the destruction of the environment. Therefore efforts should be made to ensure that further aquaculture in the area should not lead to degradation of the natural environment, including destruction of fish populations, pollution, spread of disease and loss of fishing grounds.

Similarly possessions of physical assets were ascertained through interview schedule. Possession of economic assets symbolizes authority and power. It provides security and confidence to the possessor also. In old age, ownership of valuables seems to influence care giving in the family. Economic attainment refers to access to or command over resources by households and individuals, which enhances their capabilities. At the most elementary level, the status of employment of household members and ownership of assets determine a household’s income, which to a very large extent determines the individual’s command over resources. In addition to their productive potential, assets also have collateral value and can be sold in the market. Thus, ownership of assets also provides a certain degree of security against adverse economic shocks. In other words, assets act as a cushion against income vulnerability, and households can fall back on them in times of economic crisis, either by selling them or by using them as collateral to obtain credit. Asset ownership is critical to both resilience and escaping poverty (Shepherd 2010). Thus assets are the most important indicators of a household’s material well-being, particularly in rural areas.

The recently conducted census 2011 also studied the household assets, both in India and Odisha, which is given in the following table:
Fishermen without assets become more vulnerable to economic crisis when earning from fishing becomes difficult throughout the year due to a decline in fish catch or bad weather conditions. For many fishermen, wages or earnings from fishing trade leave very little surplus beyond their regular needs. Even households who manage to generate some surplus income use it up quickly during lean periods or spend it on repairs of houses or for weddings and funerals. When the savings are spent or when the fishing season is low, fishers are forced to diversify or sell their household assets. However, this proves that basic household assets not only help in generating some regular income, but also help in getting some resources during crisis or lean period. The researcher therefore tried to understand the number of physical assets the fishermen possess, which help them both in generating extra resources, and also act as great support during the lean period.

### 5.3 Possession of assets by the Respondents

<table>
<thead>
<tr>
<th>Assets</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage</td>
</tr>
<tr>
<td>Scooter, Motorcycle, Bicycle</td>
<td>254</td>
<td>56.4-</td>
</tr>
<tr>
<td>Tape recorder, Audio system, Radio</td>
<td>117</td>
<td>26.0-</td>
</tr>
<tr>
<td>Television</td>
<td>85</td>
<td>18.9-</td>
</tr>
<tr>
<td>Sewing Machine</td>
<td>16</td>
<td>3.6-</td>
</tr>
<tr>
<td>Freeze</td>
<td>14</td>
<td>3.1-</td>
</tr>
<tr>
<td>Bullock cart, Rickshaw</td>
<td>8</td>
<td>1.8-</td>
</tr>
<tr>
<td>Fan, Air cooler</td>
<td>233</td>
<td>51.8-</td>
</tr>
</tbody>
</table>

The household assets possessed by each family like motorbike, television, refrigerator, etc., were observed through questionnaire method. The study shows that the economic status of the fishermen is not very good, in terms of possessing necessary assets. While 56% respondents possess some kind of motorbike in their family, 52% have fan or air cooler in their home. Only 26% respondents have audio systems in their home and 19% have televisions. A mere 3% respondent only possess refrigerator. The study also proves that 98% of the respondents do not possess bullock cart or rickshaw. This means most of the transportation is made through autos, buses or public transport systems.
This portion of the study does not give a good picture of the economic situation of the families in the study area. As most of the respondents do not possess TV, Radio, they are not able to get even important messages related to market weather forecast, which can actually help them.

Economic attainment and the well-being of fishermen are highly dependent on the status of employment and access to assets. Fishermen will be able to have access to the assets only when they will have steady income. New technologies such as provision of ice for cold storage, better transport facilities, effective credit linkage, all have impact on the fishery sectors.

Possession of animal assets was another important component, which was studied during the research. Fishermen are vulnerable to uncertain events. They often have insufficient resources to act as buffers during critical periods. Uncertainty arises in many different spheres. Natural hazards such as floods, cyclone may deplete fish catch and ruin the local economy. Seasonal changes although predictable in their occurrence are less predictable in their impact. Seasonal changes may occur in terms of reduced fish catch, increased prices for basic necessities, human and animal illnesses, pest attacks, labor demands, etc. Politically, households are vulnerable to changes in policies such as rural development policies, agricultural subsidies, etc, which influence household decision-making. Social uncertainties may also have negative effects on the fisherman's households.

Thus importance of domestic animals as assets and livestock has been recognized by the poor fishermen for livelihood activities. The livelihood requirements that the livestock can fulfill include: cash income from sales of animals, their products and/ or their services; as buffer stocks when other activities do not provide the returns required; as means of saving, accumulating assets, insurance and providing co-lateral for loans; as inputs and services for crop production; for transport, fuel, food, fibre for the household; and to fulfill the social and cultural functions through which livestock ownership provides status and identity.

In a fishermen's family, it is important to have the animals, as it provides them some income during the lean period. Therefore during the research it was intended to understand the number of animal assets the fishermen possess, which can be considered as an alternate livelihood for them.
Only 9.3% of the families have cows, whereas 4.4% families have buffalos. Similarly 4.4% families have pigs and only .2% families have goats. 2% families also have the poultry birds including chicken and ducks. This proves that fishermen do not have enough animal assets and makes them susceptible to the lean period, when the fishermen struggle to generate even minimum amount of income.

Fishers do not prefer to change their profession to non-fishing business. Therefore, it is desirable that some successful SHG's income generations activities are strengthened through providing them animal assets. This can be done by undertaking pilot projects in which the fishers can be encouraged to adopt alternate income generation activities. Goat farming is known as the profitable business for the community. Fishermen in and around Chilika should be advised for goat farming and government should provide financial support. Simultaneously market channel should be established in the area to ensure fishermen can sell the goats without much effort. Similarly diary can also be promoted for income generation, since milk demand is common in each village. Basically, milk marketing in Odisha is managed by Odisha State Cooperative Milk Producers Federation Limited (OMFED). Although OMFED has supported programs for the individual people as well as for the SHGs to go for dairy farming, OMFED can also purchase milk from the village when marketable surplus, (excluding consumption volume in the area) is more than 100 liters per day. Similarly poultry, duckery, etc can also be promoted by giving subsidies, so that the fishermen have a steady income even during distress. Since CDA has only fishery experts, they should form a technical committee which consists of experts from related departments, who can advise on this subject. Fishermen have no experience for goat and dairy farming. Therefore, technical trainings for the fishermen on these lines should be must. Training modules for goat and dairy can be developed by Department of Animal Resource Development. Similarly veterinary services should be provided, so that there is less mortality and there is more profitability.
5.3 Daily Fishing hours

Working time is the time duration that an individual spends at paid occupational labor. Unpaid labors such as personal housework are not considered part of the working time. Many countries regulate the work week by law, such as stipulating minimum daily rest periods, annual holidays and a maximum number of working hours per week. Working time is a quantity that can be measured for an individual or, in the aggregate, for a society. In that case, a 40-hour workweek would imply that individuals within the society, on an average work 40 hours per week. If the work week is too short compared to the society's ideal, then the society suffers from low availability of labor. Work week being equal, it will tend to result in lower real incomes and a lower standard of living. In contrast, a work week that is too long will result in earning more money at the cost of stress-related health problems as well as a "dearth of leisure." Furthermore, children are likely to receive less attention from busy parents. The exact ways that long workweeks have a direct impact on culture, public health, and education.

However, fisheries being self-employed job, no such working hours are mentioned. In Chilika most of the time the amount of fish catch depends on the amount of hours spent in the lake. This also varies depending on the season. Sometimes the fishermen are forced to spend more hours in the lake to catch the minimum amount for their survival. Many a times spending time in the lake also depends on the number of persons engaged for fishing. Working hour for the fishermen here is defined as per day of work.

For 35% of fishermen there is no fixed hour for fishing and it depends on the catch. However 32% fishermen spend more than 8 hours inside the lake for fishing. Similarly 17% fishermen spend around 4 to 8 hours, where as 15% fishermen spend up to four hours a day for fishing. When the fishermen goes in the sea for fishing, they take a longer time for returning back, which affects their both mental and physical health.

As there is no clear-cut guideline for an informal society like fishing industry, it is difficult to establish a set of guidelines to regulate the hours of fishing for the individual fishermen. But it is essential to ensure, that the fishermen get time to take a break, which will not only ensure a healthy life, but will increase productivity. Chilika being a common property, community has a bigger role to play, and regulating and managing hours of fishing, both in and outside the lake (sea) should be left to the community to manage. However, CDA should try and create awareness on the bad effect of long hours of fishing.
5.4 Ways of selling fish

Selling is offering to exchange something of value for something else. The something of value being offered may be tangible or intangible. Changes in marketing patterns, from local to international, from fresh to frozen, from informal to cash-based transactions have brought about changes in sharing patterns and has also changed the livelihood of fishermen in many areas of Chilika. Many of the fishermen have therefore shifted to selling fish collectively and sharing the cash returns. There is also a clear division of labour between men and women where women were involved in selling fish. However, in any case, independent traders fetch much lower prices than those offered by local businessmen. On the other hand, local cooperatives/selling points ensure regular and sure business for the fishermen.

The middleman-trader is relatively a new phenomenon. They came into scene only after the shrimp export markets began to grow. The increased demand for fish during the late 1980s and early 1990s led to a reorganization of fish procurement and trade networks and encouraged many fishers to set themselves up as middlemen, procuring fish for outside traders and processors.

Each agent has an arrangement with a particular company, which sometimes provides soft loans to procure shrimp from individual fishers on its behalf. The commission agent uses the money or inputs to make loans to fishers in return for their catches. For fishers, the advantage of working with the agent is that the agent buy their product immediately after landing, thereby relieving them of the responsibility of carrying it to a distant market. The agents also frequently lend fishers money during lean periods and for production and consumption needs. Considering that this kind of assistance is not forthcoming from other sources and that the interest is collected in kind, fishers are willing to forego a part of their income for this facility.

Fish traders can be easily classified into rich and poor by virtue of the investments involved. The hierarchy begins with traders, who deal in export varieties of fish, and proceeds downwards to the petty fish traders, who buy and sell fish in cash or kind entirely within the local area. In order to ascertain whether the fishermen gets his due, questions were asked to know where they usually sell their catch.

63% of fishermen sell their catch through middlemen. Whereas 29% sell their fish directly in the market and 2.7% sell it to the processing units. Only 2% sell fish directly through some middlemen. This shows that fishermen usually sell their catch to middleman (money lender) whom fishers usually rent money from at a predetermined price. It is also true that fishers sell their catch by themselves or through their family members in Chilika area.
There are some large scale landing stations in Chilika such as Kalupadaghat and Sorana in Northern sector and Balugaon in central sector. Some fishers in each sector land their catch to these larger centers. However, some of fishers land their catch in their own village also. They sell catch at the collection center in their villages. Some villages send their catch to major landing centers such as Balugaon after collection of their catch at the village. There are number of fish collection boats operated by whole sellers in Chilika who also collect the catch from the fishing boats inside the lagoon. These collection boats purchase fish from contracted fishing boats on the lagoon. Auctioneers do not trade fish themselves, but arrange the sale through an auction or bargaining system and charge a fixed sum or a percentage for the service. Auctioneers generally belong to the fishing community and often come from the same village as the sellers. In some villages, the auctioneers pay a certain fixed amount or a portion of their daily earnings to the village for the right to auction.

With increased demand for variety of fishes, many fishers procure fish as agents for outside traders. Majority of these resellers are mostly women and are considered very poor. This occupation allows them to earn a living without investing any money as they frequently collect money from the buyer before making payments to fishers. Their role is confined to participating in auctions, buying fish and handing it over to traders in return for a commission.

Identifying and linking poor primary fishermen to productive opportunities in fishing and fish sub-sectors can significantly increase incomes as they access high-value markets and sell value added produce. Sustainable supply chain development should be one area, which the government should try to develop. The five key sectors which need to be focused are developing input supply chains, promoting productive technologies, private sector-led training, adding value and linking producers to markets.

Under developing input supply chains, CDA should establish new input sellers or diversifying the product range sold by existing input sellers. This can be done by enhancing the access of poor fishermen to quality inputs, technical knowledge and market information. It should also promote productive technologies by linking research institutions, local traders. Private sector led training can facilitate the sustainable delivery of essential skills training for fishermen through local private sector actors who understand the potential of the bottom of the pyramid customers in expanding their sales. Similarly adding value through developing small processing units should be ensured where the fishermen can undertake product grading of their catch. Linking producers to markets can also be a major activity through which the fishermen can directly sell their products to the national and international players. This along with proper credit system by
the government can ensure that the fishermen have their own market linkage and have a better income.

5.5 Storage of fish.
To prevent economic losses the processing and preservation of fresh fish are of utmost importance since fish is highly susceptible to deterioration immediately after harvest (Okonta and Ekelemu, 2005). If fish is not sold fresh, preservation methods should be applied to extend shelf-life. Lack of adequate fish handling, processing techniques and storage facilities contribute significantly to the low supply of fish to poor rural dwellers that form three quarters of the population in developing countries (Ayuba and Omeji, 2006). The development of fishing machinery and techniques that can be employed for effective fish handling, harvesting, processing and storage can never be over-emphasized especially in the age when aquaculture development is fast gathering momentum. Fish processing is to increase the storage life of the fish and to give the product a form which is attractive to the consumers. The major criteria of the fish storage should ensure full health safety of the product, proper sanitary conditions as well as preserving it from the development of harmful micro-organisms and toxins. High quality products which are safe and satisfied to the consumers can be reached by compliance with processing parameters from the start of the operation to the storage and distribution of the final products. With improved technologies, fresh fish can be stored for any period required without any significant loss of quality.

This shows that for highly perishable items storage facilities are vitally important. Transportation and telecommunications facilities have made it possible to move fish over long distances in a very short time, and this has contributed to the rapid development of Chilika fish markets. In Odisha, road and rail transport networks are less developed than in the rest of the country (Government of Odisha, 1997: 20/4; 3/7). However, road transport by truck both insulated and un-insulated has increased rapidly in the last decade. Ice is one of the most important component for storing fish for a longer period. The introduction of ice in the 1990s changed the fisheries sector rapidly. Dahl and Forsgren (1988: 24) noted that the beach landing craft (BLC) from Pentakota carried salt on board to preserve the fish. However, by 1988 important fish landing centres such as Pentakota had ice plants, and fishers had ready access to ice after landing the catch.

Number of villages are located in the islands of Chilika, far away from the urban centers and therefore having storage facilities at the village level is difficult. During the survey questions of
storage facility were asked to ascertain, whether the fishermen have enough storage facilities, as without proper storage, there is a high chance that the fish will get wasted?

While 45% fishermen store the fish in their boat, before selling it or handing over to customers, 37% store them in a godown, which is safer. 16% store them in their own house and only 2% store them in other places. This proves that the maximum number of fishermen sell their fish directly in the market and therefore do not depend solely on the godown. Similarly the fishermen who have access to godowns, store their fish in the godown. This is also being done through the middlemen, who instantly take the fish from the fishermen. In any case it is important that the fishermen should have access to better storing facilities with ice, so that the fish does not get spoiled.

New technologies such as ice and better transport will definitely for sure help fish producers' obtain higher returns for their catch. Price of the fish will increase as ice as a preventable source will add to the maintenance cost. As a part of the endeavor to promote the sustainable fisheries in Chilika, the post-harvest fish quality management and maintenance of cold chain system should be considered imperative and a priority. This is essential to prevent loss, maintain high quality and realization of better price. CDA should initiate to supply highly efficient Insulated Fish Boxes to Chilika fishers having their own fishing boats. The facility can be extended through the Primary Fishermen Co-operative Society. Subsidy assistance should be provided to ensure that all the fishermen can buy and use the box. At the same time, it should be ensured that only the fishermen who have boats with valid registered license only get the box. This will promote a sense of awareness among the fishermen to have license for their boats and in turn will ensure their long term livelihood.

Similarly, packaging forms an important part of food processing because it facilitates handling during storage and distribution within the marketing chain. Packaging material must possess certain characteristics, such as adequate strength to protect the packaged product from damage. It must be readily available and easy to use, and should be clean to prevent contamination by undesirable substances. CDA along with MPEDA should ensure that high quality packaging materials are available with the fishermen with a lower price, so that they can keep the fish fresh.

5.6 Impact of Prawn Export on Local Livelihood

Fish are sold in numerous forms in Odisha, with the more important being: fresh for local sale, chilled mainly for distant domestic markets, frozen for export, dried both for export and local business. The main urban centres for fish within the state are: Cuttack, Puri, Bhubaneswar,
Rourkela, Berhampur and Sambalpur. Major out-of-state urban markets for fresh fish include Howrah, Chennai, Hyderabad and New Delhi. The inland markets in Odisha are of two types, those with good transport linkages and those without. Markets with good transport linkages receive large quantities of fresh fish from both capture and culture sectors.

More than 92 percent of the shrimp produced in the state are exported abroad or to other states (DOF, 1998: 14). The main international markets are Japan, the Middle East, Southeast Asia, the United States and Western Europe (Marine Products Export Development Authority, MPEDA, 1995: 2a; DOF, 1998: 76). The high demand and prices for these products have stimulated an efficient marketing and transport system.

A total number of 217 species of fresh- and brackish-water fish comprising 147 genera, 71 families and 15 orders were reported from Chilika Lake, as well as 24 species of prawns and shrimp, 9 families of crabs comprising 28 species and 136 species of molluscs under 66 families (Ayyappan and Jena, 2000: 242). Chilika is Odisha's leading centre for fish, prawn and crab fisheries. The growth of prawn aquaculture as a new technology has taken over traditional methods of fishing. The lake has become almost one vast prawn farm. In the process it has attained a doubtful division of being the major illegal aquaculture complex. Prawn culture mostly involved non-fishermen from outside including middlemen and local politicians who leased large areas of the lake, since it had demand in the global market as well as in the markets outside the state. On the other hand it does not require more investments and traditional knowledge of fishing.

Illegal prawn culture has led to many bloody battles in the lake areas. Leaving apart, lake's ecology is also in danger because of the illegal prawn farming over vast areas of fishing ground. The gheries block the water channels, affect the migration of fish juveniles and cause the loss of grazing ground for fish. They also act as silt traps and accelerate siltation. In the backdrop of this, in 1997, Odisha State Assembly's House Committee accepted that prawn culture indirectly make a serious impact on the living conditions of the fishermen who depend on the waves of Chilika for their livelihood such encroachment ultimately leads to exploitation of poor fishermen. However, so far no concrete step has been taken to stop this in Chilika. Apart from this a huge amount of prawn are also captured from the lake, which are transported to the foreign countries.

In the midst of all the issues, the most important issue which needs to be answered is, whether prawn export helps in generating local livelihood. This was tried to ascertain during the research through individual and group discussions.
While 42.89% respondents felt that prawn export helps in local livelihood, 46.67% respondents did not feel the same. 10.44% respondents have no idea about the debate. This proves that prawn fishing for export does not play a special role in the local livelihoods.

The study proves that the big exporters came into scene only after the shrimp export markets began to grow. Fish traders can be easily classified into rich and poor by virtue of the investments involved. The hierarchy begins with traders, who deal in export varieties of fish, and proceeds downwards to the small fish traders. Thus for the first group it is a fact that the limited number of exporters, who deals with prawn export, does not add much value to local economy, whereas the second group differs on this view. They feel even the small number of exporters helps in strengthening local economy. This is probably because they engage the local fishermen in packing and loading, they also buy the packing materials including ice and thermocol basket from the local market and thus helping in strengthening the local economy.

Increasing economic growth rates for a particular section of people is essential but it is not enough. The quality of economic growth, its sustainability, composition and equity is equally important. Inequalities in incomes and access to assets tend to undermine both the pace and quality of growth and hence it adversely affects the poverty reduction. When inequality gives rise to conflict and violence, it has disastrous impact on humans and the economics. Therefore government should focus on minimizing the gaps and ensure balance between the so called rich exporters and the traditional poor fishermen. It should also strictly review the tax aspects from fish export point of view. The collected tax can be used for the welfare of the local fishermen.

5.7 Fishing merchants/ boat owners employed local people on preference

Owners of mechanized and motorized category boats are usually considered a higher class among the fishermen. Sizeable investment is required to acquire a boat, and each fishing operation requires some working capital. A boat owner seldom goes fishing themselves, particularly in the mechanized sector, where boats are sometimes owned by people from non-fishing backgrounds, who are more concerned about returns on their investment. The mechanized boat owners constitute both new entrants from outside, younger fishermen and powerful local elite. These boat owners usually keep their own crew members, who catch fish for them.

In this case, the fisherman, who gets engaged, gets a standard salary; in addition, they also get a kind of bonus, when there is more catch. The fishermen engaged in this profession are both
from the local village and from the adjacent villages. However, they represent the people, who engage them; and not as a self-employed fishermen.

67% of the respondents informed that the farms never care about the local people and keep their own people. At the same time 31% informed that the farms keep local people as a preference. This proves that the local fishermen who have limited opportunity to be engaged in their areas, becomes even more vulnerable.

It is therefore important to ensure that the local fishermen are engaged for fishing by the crew owners. More stress should be given for the fishermen who are poor and vulnerable from economic point of view. The local Panchayati Raj members should be involved in the process of engaging these fishermen. Similarly government should identify the fishermen, who are old-aged, partially handicapped and put them into work with the fishing firms, who are engaged in exporting.

5.8 Need of a Traditional Fishermen’s Association

An association can be considered as a group of individuals who voluntarily enter into an agreement to accomplish a purpose. An association of traditional fishermen is a forum through which the traditional fishermen can express their concern to the government on the issues they are facing from time to time. The group can also work on various other issues which the traditional fishermen face, including the socio-economic. During the study, it was tried to understand, whether the fishermen feel the need of a traditional fishermen’s association and they feel insecure at any point of time about their livelihood.

The study reflects that 76% of respondents feel the need of establishing traditional fishermen’s association. Only 24% respondents do not feel the need of traditional fishermen’s association.

An Association matters because the members of the association understand their value and join together to make them work. Association matters only if the members believe that their voice matters. Members form societies in order to attempt to maximize their collective power, get the best possible benefits, and improve working conditions. The fishermen view the need of forming the traditional fishermen’s association to further strengthen their voice against their demands. In view of the constant threat from the outsiders and big businessmen, the need of traditional fishermen’s association becomes even much stronger.

Few of the fishermen during interaction, informed that there is an association comprising of only the traditional fisher communities as its members who work for the rights of fisher persons called "Matsyajibi Mahasangh". If such an institution already exists, it should be further
activated, strengthened, and has to be inter-linked with the government agencies like Chilika
Development Authority. The agency should have the power to plan and implement conservation
measures collectively. Sense of belongingness will bring more support towards both conserving
and developing the fishery resources in the lake. Regulation for the entry of non-fishers and
identification/ registration of all local fishers with issue of identity cards can help to improve the
situation.

5.9 Existing Government Support Structure
Welfare schemes can take a variety of forms, such as monetary payments, subsidies housing,
health facilities, subsidized loans, etc. Welfare schemes can be provided by the government,
non-governmental organizations, or a combination of the two. They may be funded directly by
governments, or in social insurance models, by the members of the welfare scheme. The
schemes are commonly designed for the individuals who are unemployed, those with illness or
disability, the elderly, those with dependent children, and veterans. Overall the schemes are
designed for a special cause and for the people who need them to fulfill their basic
requirements. In a more general sense, Welfare schemes aim for the well-being of individuals or
a group in other words, their health, happiness, safety, prosperity, and fortunes. India, being a
federal country, have different kinds of welfare schemes at both Central and State level. The
schemes are implemented by various Central and State Government Departments, while some
of the schemes are completely funded by the central government; some are funded by the state
government.

Similarly, training has specific goals of improving one’s capability, capacity, and performance. In
addition to the basic training required for a trade, occupation or profession, it is recognised that
time and again there is need for refresher trainings beyond initial orientation to maintain,
upgrade and update skills throughout working life. People within many professions and
occupations may refer to these sorts of trainings as professional development. Training plays an
important role in the life of people as well as in the life of trainers. Overall training helps in
improving self-confidence, motivation and at the same time fine tunes skills, which increases
productivity. It helps in taking initiative and become more innovative. It also increases the
fishermen’s ability to adapt to change. The skill based trainings can help in getting the
transferable skills which may result in more work opportunities.

There have been examples, where CPRs are being regulated further and have been made as
private or government property. Exclusion of the poor from common property is being enabled.
In influence of and in the name of a number of processes like liberalization, marketization,
environmental degradation agricultural intensification and industrializations, the poor are being deprived of the common property where as the rich & influential are increasingly trying to capture the common property used by the poor seeing the increase in value. In the fishing business the trend shows that the systems pertaining to the regulation of common property lands which existed in the past are weakening with time. The increase in population is adding to the pressure on resources, which has resulted in downgrading and damaging the properties.

Under the broad head of government support structure, the researcher has tried to study three components, i.e. knowledge of government schemes for fishermen, provision of technical support for the fishing activity in the area and provision of training on modern fishing technology.

Expression of rights of access and control over fisheries in any open area is the result of the planned management by local communities. In Chilika access rights are managed by the fishermen both in terms of spatial and temporal contexts. However, in the course of time several government departments have also started regulating Chilika’s water. During the research it was tried to ascertain whether the fishermen need that the access be controlled by any authority and if the regulation of water will add any value to their life and livelihood.

Out of 450 respondents 66.6% informed that the community should continue to regulate their access to Chilika, whereas 26.6% wanted that the state government to regulate the access. Only 6.8% respondents informed that the lake should be regulated by both government and community.

It is evident from the findings that a powerful indigenous management system is in operation in Chilika. This has supported the fishermen for generations and has proved to be beneficial for them. During informal discussions with some of the educated respondents from Mahisha, it was informed that the state’s interventions in Chilika lake at various levels including restrictions on traditional fishing rights, regulating fishing gear types, introduction of mechanized boats, declaring certain areas of the lake as protected and restricting access to resources in the designated areas have affected fishermen during the last few years. This is the reason why the fishermen do not want the government to regulate the Chilika and want open access.

Common property like Chilika Lake is of central importance to the fishermen, and should be an important part of development strategies. This should further be strengthened and the community should be allowed to own and manage it. However the authorities involved should identify and highlight aspects like mechanics of equity issues, understanding of evolution of community management over time and the key elements of traditional management structure.
which may be useful to support now a days. This will help the communities specially the marginalized groups to have better management and get good benefits.

Government department having control over Chilika was one of the key indicator which was studied during the research. Different views exist about the role of the government in creating and enforcing property rights. For example, in the classic liberal-utilitarian model, one can see a rigid contrast between state and civil society. The society is mainly understood as a network tied together by contractual relations with additional contracts between individuals. The state considers itself an authority responsible for enforcing the contracts. State management, therefore, focuses primarily on the control of access to resources and the coercive measures to execute the command and controls. In other contexts where the customary institutions are strong, the communities have their own enforcement rules and norms the state has a very small role.

Costal Odisha is rich for its fishery resources; however it is not free from the problems like environmental degradation, over fishing, traditional fishing pattern and minor conflicts between the fishermen regarding the ownerships. The problem gets compounded by the fact that, tensions not only exist between traditional use patterns and formal systems of ownership and use, but also at times is due to differences amongst different formal systems themselves. There are many players in the coastal environment; each with their own agenda, activities, roles and responsibilities, and it is often very difficult to determine their territories. For example, when intensive practices are seen to destroy the natural ecosystems, the environment department steps in, claiming ownership of the natural resources and regulating, restricting or closing off their access to everyone, including their traditional users. At the same time different other state organizations sharing the same objectives also get into action when required. For example, coastal conservation and management programmes are run under various state and central government initiatives, involving the departments of forests, fisheries, environment, industries, revenue, coast guard and tourism, besides a host of quasi-governmental and non-governmental organizations with overlapping roles and responsibilities. In number of cases, however, different organizations have countervailing agendas.

Conflicts arising due to unclear roles of multiple players adversely affect the access of the poor people, who are dependent for their livelihood on the traditional resources. In the recent years, Chilika at a broader level, the access has become more open as several new stakeholders have started claiming ownership and access on the lake water. These include various state government departments also. In addition several NGOs, and political parties also put a major
impact on the life of the fishermen. During the research, it was tried to understand, which departments are involved in managing, regulating the Chilika. This will give an idea on whether the lake water is regulated and also if the fishermen enjoy complete independence in terms of access.

The study provided an insight about which department of the government controls the Chilika according to their knowledge. Out of 450 respondents 40.67% informed that the Department of Revenue controls Chilika including the local administration. 16.22% informed that the Department of Forests and Wildlife and 14.89% informed that Department of Fisheries controls Chilika. 19.33% do not have any idea about who controls the lake. Only 8.89% viewed that some other department controls Chilika.

During informal discussion, it was revealed that most of these departments are interested in exercising their authority to execute controls which often leads to conflicts amongst themselves and with local fishing groups. In addition the most recent issue is involvement of Police Department. Followed by several bloody fights and after the interventions of Odisha High Court, the Police have also become active in the areas. It is thus evident that at a broader level there is a conflict between different state agencies due to opposing interests. The Department of Fisheries is interested in higher revenues by way of granting more leases to outsiders for aquaculture, whereas the Department of Forests and Wildlife is interested in closing some areas for better control. The Chilika Development Authority (CDA) is interested in overall development of the lake ecosystem. The major activities taken up by CDA were the desiltation of the channel connecting the lagoon to the sea and opening of a new mouth to restore the natural flows of water and salinity levels. Though CDA has taken up some alternate livelihood generation activities for the fishermen but they have not yielded any result at the same time CDA does not explicitly see the access controls to the lake resources as an important factor that needs to be addressed.

This proves that most of the fishermen are aware that the local district administration has more control on the lake and thus they can inform any of their grievances to the district administration. It also proves that the fishermen are aware about the other departments like Department of Forestry and Department of Fisheries, who have stake on the Chilika. Among others, few fishermen believe that Police Department controls the lake while few others think that Judiciary and political party control the lake.

Thus, while seeking greater collaboration with local, national, and international stakeholders including various departments, CDA should focus on creating an organizational culture which
facilitates greater cooperation and interdependence between various stakeholders. A study should be conducted, which can suggest solutions to bridge the gaps of the organisational ability to achieve the outlined objectives. There should be regular meetings of the various departments at the same place under the leadership of CDA, where various inter-departmental issues can be discussed and addressed. The fishermen should also get a floor to discuss the issues they face and accordingly can sort out. While overall responsibility should remain with CDA, the organisational structure need to be further strengthened.

Role of Chilika Development Authority for Development of Fishermen has always been under review by the researchers. Fishers and Mahajan (1997: 135) show that a plethora of agencies, such as the Odisha State Fisheries Cooperative Marketing Federation, Odisha Fish Seed Development Corporation, Odisha Maritime and Chilika Area Development Corporation, Central Fishermen Marketing Cooperative Society (Chilika), Directorate of Fisheries and various fish farmers’ development agencies have key responsibilities in the fisheries subsector. In addition, policies in other sectors such as revenue, forestry, health, education, transport, energy, agriculture, coastal area management and rural development have an impact on fishers of Chilika.

Chilika Development Authority (a Government of Odisha Agency) has been created under Forest & Environment Department of Government of Odisha in the year 1991 with an objective for conservation of ecology of Chilika lagoon and to bring an all-round development in and around the lagoon which calls for multi-dimensional and multi-disciplinary development activities. The broad objectives of Chilika Development Authority are to protect the Lake’s ecosystem with all its genetic diversity, to execute various multidimensional developmental activities either itself or through some other agency to enhance the economic condition of the community, to survey, plan and prepare the project proposal for integrated Resource Management, to cooperate and collaborate with other institutions of the State, National and International institutions for all-round development of the lake. CDA also is responsible to establish management information system for the lake and to promote long term multidisciplinary research, prepare environment status report and establish education centre for the lake. For its achievement CDA has won Ramsar Conservation Award and Indira Gandhi Paryavaran Puraskar in 2002.

Besides this, the other aims and objectives are to control the silt load in to the lagoon through catchments management in a participatory manner. Management of Macrophytes and invasive species, sustainable fishery resource development, conservation of biodiversity, eco-restoration of Islands including habitat improvement of birds, improvement of communication network,
promotion of eco-tourism, inventory and assessment of the lagoon resources, environmental impact assessment, upgrade the management and professional skills of the member associated with conservation and development of the Lagoon and to undertake preservation and management of other wetlands of the State are some of the objectives of CDA.

The general superintendence of the affairs of the authority is vested with the governing body. Chief Minister of Odisha is the Chairman of Chilika Development Authority, whereas Minister of the Forest & Environment Department is the working-Chairman. All the duties, powers, functions and rights whatsoever consequential or incidental to carry out of the objectives of the authority is exercised by the Chairman or by powers delegated to Vice-Chairman or Chief Executive. The Governing Body is bound to carry out all directions that the state government in Forests & Environment Department gives from time to time.

During the initial period, the major activities taken-up by CDA were the de-siltation of the channel connecting the lagoon to the sea and opening of a new mouth to restore the natural flows of water and salinity levels. There has been an increase in the lagoon's fish yield and a reduction of freshwater weeds due to the de-siltation process. In a later stage, CDA has taken up many developmental activities in the fishing villages adjacent to the lake.

During the study, it was tried to understand people's perception about the role of Chilika Development Authority for the development of fishermen. This helped to understand the linkage between the traditional fishermen and the CDA and the kind of benefits the fishermen explicitly expect from CDA.

While 45.11% respondents feel that CDA plays an active role in development of fishery and fishing activity in the lake, near about 55% respondents feel that the CDA does not play any role as per its objectives. So most of the respondent's view that the CDA does not play any remarkable role for the lake and the fishermen and the least of them feel that the authority plays an active role towards it.

This proves that CDA does not explicitly see the access controls to the lake resources as an important factor that needs to be addressed on priority, which has created a level of dissatisfaction among the fishermen. While CDA has done more work in environment sector, fishery development or community interaction has not got much attention. Ensuring sustainable livelihood involves a political process. It requires dedicated efforts to empower the poor fishermen by strengthening their voice and fostering democratic accountability, which CDA is currently lacking.
The complexity and dynamics of wetland ecosystem like, Chilika demands a robust work organisation which facilitates cutting edge research, supports the scientific, engineering and management interventions, regulates fishing, tourism, and various other activities, and promotes overall development of the Chilika's fishing community. However, present organizational structure of CDA is highly inappropriate with the scientific, managerial, regulatory, and developmental challenges faced by CDA, as there are huge gaps in the organizational hierarchy at all levels.

CDA must take proper steps to save its ecology from deterioration and environmental degradation. It should focus more on the socio economic issues and should try and correlate the environmental issues with it and not vice versa. CDA must ensure that the lake must not be used for 'culture fishing'. The interest of the poor and the marginalized section (fishing communities) who are its inhabitants since centuries must be taken into consideration. They must have the right to capture fish in Chilika as their livelihood/profession i.e., fishing to sell the products. Chilika as a common property should be managed by local collective action and CDA should play an active role as an autonomous body in which the fishermen community must have the majority. All the policies, bills and major decisions of the CDA should be taken in joint consultation with the fishermen. CDA should also initiate community mobilization process more appropriately through the local NGOs. The agency to a great extent has successfully mobilised funds for initiating alternate livelihood activities for the fishermen. Now it will be vital for the agency to see how the best practices which have emerged can be replicated in other villages, so that the fishermen get an opportunity to make more income. To initiate this activity the agency should launch a drive to bring back the confidence of people towards it. In such cases external agencies like Food and Agriculture Organisations can also play a vital role by supporting such activities. This will not only bring back the confidence of fishermen of Chilika on CDA, but will also ensure that the activities initiated by CDA are successfully implemented.

Government schemes for fishermen, one of the major support structures, were studied by the researcher. Some of the major centrally sponsored welfare scheme for the fishermen are, Centrally Sponsored Scheme on Development of Inland Fisheries and Aquaculture, Centrally Sponsored Scheme on Development of Marine Fisheries, Infrastructure and Post-harvest Operations, Centrally Sponsored National Scheme on Welfare of Fishermen, Central Sector Scheme on Strengthening of Database and Geographical Information System for the Fisheries Sector, National Fisheries Development Board (NFDB) and Issuance of Biometric Identity Cards to Coastal Fisherman.
National Fisheries Development Board (NFDB) was set up in September, 2006, with its headquarter at Hyderabad to realize the untapped potential of fisheries sector in inland and marine fish capture, culture, processing & marketing of fish, and overall growth of fisheries sector. This is done with the application of modern tools of research & development including biotechnology for optimizing production and productivity form fisheries. The activities of the board are focused mainly towards increasing the fish production of the country. Similarly in 1991-92 by amalgamating two schemes Janta Personal Accident Policy (Started in 1983) and National Welfare Fund for Fishermen (started in 1986-87). A new programme called Saving-cum-Relief. Training and Extension scheme (started in 1994-95 after modification of the scheme, namely, Training / Seminar/ Workshop) which was operated as a separate scheme till 2006-07 has been merged with the National Scheme of Welfare of Fisherman as a component of the Scheme. Government of Odisha has introduced a number of schemes for both culture and capture fishers in the state. Similarly, numbers of schemes are also introduced by the Department of Animal Husbandry & Dairying, Ministry of Agriculture, Government of India. While some of the schemes are applicable for the fresh water fishery, some are applicable for the marine fishery and brackish water fishery. Though there are no special schemes for the fishermen of Chilika, the common schemes applicable for the other fishermen also apply to them. However, in any of the cases, it is important that the fishermen should be aware of the schemes, so that they can avail the facilities. The research therefore tried to ascertain, whether the fishermen are aware of the welfare schemes, so that they can take the benefits. The study revealed that 95% fishermen are not aware of the major government schemes for the fishermen and only about 5% know about the schemes. This proves that the fishermen are not aware of the major schemes meant for them. Lack of awareness among fishermen about government schemes means they are vulnerable during the crisis as they remain deprived of adequate facilities during need for which they are entitled. The fishermen should be informed about the available welfare schemes to avail the benefits for timely support. Fishermen should be empowered with information on their legal and constitutional rights, entitlements (benefits from government schemes) and accountability mechanisms such as grievance redressal and the Right to Information Act. The methodology of 'learning by doing' can be adopted in order to encourage meaningful participation by fishing communities. The important step to create awareness that CDA can take is to provide a structured training to citizens on the important government schemes and their rights. Awareness generation through mode of legal literacy camps, wall paintings, and publications should be
explored. Similarly regular panel discussions, citizens and government interface will prove to be beneficial.

Provision of technical support for the fishing activity can always be an added advantage for the fishermen. This was closely studied by the researcher. Over the last 50 years, compared to the traditional approach of fishing which was largely labor intensive, great technical diversity has developed with modern, capital intensive, and specialized technology approach. The result is that community-based, small-scale fishing has given way to production based on industrial principles of organization and complex technology in order to feed international markets. Prolonged collaborative activity of community people is indispensable for community development based on the conservation of natural environment and sustainable use of fishery resources.

In order to promote fisheries sector Govt. of India has four institutes. These institutes help in providing technical Manpower to the sector. Central Institute of Fisheries Nautical and Engineering Training (CIFNET), Cochin, Integrated Fisheries Project (IFP), Cochin, Fishery Survey of India, Mumbai and Central Institute of Coastal Engineering for Fishery (CICEF), Bangalore. In addition, there are several State Government institutes on coastal ecosystems, mangroves and fisheries research.

As already reflected in the study, fishermen are still using traditional methods of fishing or sometimes such gears which are adversely affecting the population of fish and other species. There was also a concern that increased pressure (more harvesting than its reproduction capacity) on the same area has affected both the quality and availability of fishes.

The study reflects a poor status in terms of technical support for the fishing activity by the government. 98% respondents feel that technical support by government is nil, whereas, only 2% feel that government provides technical support for the fishing activities. This makes the fishermen ignorant of the technical expertise required for fishing which can help them improve their livelihood, thus without technical support from the government their productivity remains constant.

There are number of areas, which need technical support from the government. Value addition for fish catches is one of the areas, which needs to be effectively introduced with technical support. Sometimes the fishermen also seek technical support for using new technologies including fishing gears, motorized boats, etc. Similarly in many places the SHGs in the fishermen villages need technical support to start different Income Generating Activities (IGAs) from Government.
It is also essential that fishermen understand the risks, respect the warning service and should know how to react during a natural disaster. Different hazards require different response system. The response to drought or a slow natural disaster will completely vary from the response to any of the sudden disasters including cyclone or flood. Experiences gathered around the world show that some hazards are difficult to predict and therefore the plan response also sometime fails at times.

In view of insufficient fish availability in the lagoon, alternate livelihood option need to be strengthened in all fisher’s villages. Value addition for fish catches needs to be effectively introduced / promoted with technical and financial support. The fisher’s wives can be made involved in the activities to generate alternate incomes for the families. The existing women SHGs can further be strengthened to start different Income Generating Activities (IGAs) through financial and technical support from the government.

The viable Income Generating Activities as suggested by the fishers/fisher women are improvement of marketing linkages, provision of bank loan for fishing (boats, gears, nets etc.), dry fish marketing and other business such as diary, goat farming, poultry, vegetable marketing, and grocery shops in the villages. Making other business initiatives based on local availability of raw materials, tailoring, crab fattening, and fish feed preparation, aquaculture in the village ponds can also be initiated. Capacity building of stakeholders, especially the fishers for alternate livelihood options needs to be done through regular trainings, interactions, exposure visits. Chilika Development Authority (CDA) should take a lead role to promote awareness of fishers for conservation and sustainable use of fishery resources, and also to establish a system of support and collaboration among stakeholders and government agencies.

CDA should explore the possibility of involving private sector in promoting and developing the technical skills of fishermen. It is not only the fishermen who get benefited from the fishing activities, but also many private players, also get benefited from this business. Thus the private farms should chip into build the technical skills of fishermen.

There is a need to educate the fishermen about the limitations of given water body to produce more and more quantity of fishes, about the impact of a given fishing gear on the quality of catch and its impact on other species. Technical support should also be provided to promote animal husbandry (like, dairy, goatery) among the community members.

Training on modern fishing technology can increase fish production as well can increase fishermen’s ability to sustain their livelihood during the lean period. Whether the fishermen have
been imparted training was studied during the research. The term training refers to the acquisition of knowledge, skills, and competencies as a result of the teaching of vocational or practical skills and knowledge that relate to specific useful competencies. So training, in general, indicates totality of instructions with planned circumstances and directed activities to which all stakeholders are subjected to induce learning and subsequently apply it during the implementation.

There are a number of state initiatives to provide training to enhance people's skills, knowledge and ability to diversify. These are often linked to attractive support packages, including credit, subsidies or new marketing opportunities. These training packages have helped people in developing their skills and ultimately has supported in their livelihoods.

The researcher during the study was informed by the CDA officials that, in the recent past CDA have taken up several capacity building initiatives for the fishermen of Chilika. In collaboration with NETFISH (MPEDA), CDA initiated the capacity building training for the local fishers with effect from January 2010 with a target to cover all Primary Fishermen Cooperative Society. The programme was facilitated by a NGO. During the financial year 2010, around hundred training camps in 86 fishing villages covered 31 PFCSs.

While fishing is a traditional business and almost all the fishermen learn it either from their family members or the peers, very few of them get proper training. However, most of the training is meant for fine tuning the skills they already have. Sometime the trainings are provided on the new technologies also, including on driving motorized boats, using new set of nets and fish breeding.

Developing capacity in alternate livelihood issues is an important activity, given the present growing and projected pressures on the Chilika Lake. To promote sustainable fishery in the Lake the capacity building of fishers need to be given priority. As a part of the endeavor to promote the sustainable fisheries in Chilika, the post-harvest fish quality management and maintenance of cold chain system should be considered imperative and priority should be given in this not only by CDA but also by other stakeholders including, Forest and Environment Department, Tourism Department and Police department. It is essential to prevent loss, maintain high quality and realization of better price. Proper training also helps in saving lives and livelihood of the fishermen.

The study reveals that while 11% fishermen are trained on some or the other kinds of fishing technique, processing or something related to fishing, 89% fishermen are not trained on any
particular subject. This proves that fishing is basically a traditional business and the fishermen learn the basic techniques of fishing from their parents. However, with the modern technology being in the market, without proper training, fishermen may find themselves obsolete in future. This will also decrease their productivity and will adversely impact their livelihood.

The most important training programme, for the fishermen are post-harvest handling and preservation techniques. This training is not only important for the fishermen but also for the fishing women, as they also play an important role in fish handling. Similarly local fishing communities should be trained on how to conserve their coastal resources and biological diversity. They should also be trained to identify various types of fish, from brackish water, and which kind of fishing resources can be explored at what time of the year.

As the research shows that mock drills are not being conducted in the fishing villages, there may also be an argument for all people working on fishing vessels required to take a survival course. In this way, emergency procedures and survival equipment use would be familiar to all who work in the industry. More analysis of this data is required before further conclusions are drawn. A known denominator of full time equivalent positions would also give a major boost to analysis. However, it can be stated with certainty that the fatality rate will significantly reduce if these training will be provided.

Similarly training should also be provided on the sustainable ecotourism in Chilika. Villagers adjacent to Satapada, Sipakuda, Mirzapur, Gabakunda and Gangadharapur are involved in tourism and therefore the training programme will help sensitize the boat operators on sustainable eco-tourism, dolphin conservation as well as promoting nature-based tourism as an alternate source of livelihood. CDA, the Department of Forest and Tourism Department should take active part in this. CDA should also ensure that all the materials published by it is translated into local language, i.e. Oriya and is being circulated to the fishermen. Some of the Annual reports and magazines should also be printed in Oriya, so that the local fishermen can keep a track of all the progress in their area.

5.10 Existence of Fishermen cooperative

Cooperative is an autonomous association of people who volunteer to cooperate for their mutual social, economic, and cultural benefit. Cooperatives include non-profit community organizations and businesses that are owned and managed by the people who use its services and/or by the people who work there. Cooperatives have been used for channel development credit to the fisheries sector. The record of cooperatives in the sector is not very encouraging. Although they were promoted with financial support from the central and state governments, their role in
improving the lives of fishers has been limited. The Eighth Five-Year Plan (1992–1997) stated that except in Maharashtra, Gujarat, Tamil Nadu and Odisha, fishers' cooperatives do not play any significant role in the development of fisheries (PHFP, undated a: 28). A study conducted by the DFID-funded PHFP found that less than 10 percent of the marine fishers in Odisha were members of cooperative societies. Seven percent of the fisheries' cooperative societies in the state were marine, although they accounted for 21 percent of the total membership (PHFP, undated a: 58). In 1997, there were a total of 616 fishers' cooperative societies in Odisha, including six apex societies, with a total membership of about 70,000 people (DOF, 1998: 95). The PHFP study (66) concluded that the primary cooperative societies were credit-starved and most of them were defunct. Officials from the co-operative department, co-operative bank, rural development department, Panchayat, self-help group organisations and other concerned agencies which have a linkage with the co-operatives, are invited to meetings as guests and speakers. Their advice is valuable in reaching proper decisions. Such a step also strengthens co-operatives relations with local bodies and financial institutions. A co-operative may not have all the resources of its own to meet the social and economic needs of the members and the community, it can coordinate with local government and non-government development agencies for economic and technical expert support from them.

The British started a cooperative store in Balugaon in 1926 to provide fishing equipment to locals. In addition, the British constituted 25 Primary Fishermen Cooperatives during the Second World War (OFC undated). During these centuries of exclusive rights, fisher folk evolved a complex system of partitioning the fisheries of Chilika amongst themselves. After the abolition of zamindari in 1953, traditional fishing areas continued to be leased out to cooperatives of local fishermen.

Cooperatives had an important role in the history of Chilika. As fishing (particularly prawn fishing) became increasingly remunerative, outside interests started entering the area in the late 60s and early 70s. The leasing system broke down completely in 1991 when the Odisha government outlined leasing policy that would in essence have resulted in the auction of leases to the highest bidder. The cooperatives challenged the order in court, and the Odisha High Court directed the government to make changes that would safeguard traditional fishermen's interests. However, no new leases have been issued till date. As a result, chaos reigns and the local people are being marginalized by powerful outsiders (Das 1993).

The most important fishermen cooperative which exists now is the Primary Fishermen Co-operative Societies in Chilika. During the study it was also informed by the CDA that there are
eight fisher's cooperative societies which are constituted by the non-fisher caste fishers in Puri district. These societies are organized only in the villages in Puri district (a part of Southern sector and Outer channel) but no such society exists in Khurda and Ganjam districts.

Questions were asked to ascertain the views of fishermen, whether there are any fishermen cooperatives in the areas. If there is an effective cooperative, it will help in supporting the livelihoods of the fishermen in the area.

80% responded that there are fishing cooperative available in Chilika, whereas 20% answered negative. This proves that there are number of fishermen cooperatives in Chilika. Being in the fishing villages, the primary objectives of these cooperatives are to protect the interest of Chilika:

During the discussion, the older fishermen informed: that traditional fishing cooperatives in Chilika Lake obtain annual lease rights for extensive aquaculture operations using the Gheri system. The Revenue Department determines the leasing pattern and collects lease payments through the Chilika Development Authority. Many cooperatives illegally lease their fishing rights to outsiders for a fixed payment in return. In the villages where field research was conducted, cooperative societies seem to have been confined to paper and to a handful of people with strong decision-making powers in the community.

In hindsight; the expectation that societies would act as a just and transparent link between the communities and the state appears unrealistic. The leaders of: societies often came from the socially influential, politically active and economically powerful sectors of the communities. It was optimistic to the point of naivety to believe that they would allow genuinely democratic decision-making processes to take root in these societies. Some of these leaders strove to maintain social cohesion in the villages, ensured equal of opportunities where possible, and represented the majority viewpoint when it came to dealing with outsiders, but they were seldom democratic.

A dedicated and honest person should hold the office in a co-operative. The person should be completely devoted to the cause, basis and principles of the co-operation and should discharge his duties honestly and faithfully. It is, of course, very difficult to define 'honesty', 'integrity' and 'devotion', but there are common factors which determine a person to be honest and devoted. Such people help the co-operative in improving its goodwill. Such people make the organisation not only responsive to the needs of members but also responsible.
Meetings of co-operatives should be held regularly in accordance with the procedures laid down in the byelaws of the co-operative. The meetings should not be delayed or held in secrecy but should be well organized in participation of all members. Proper documentation should be prepared for the discussions held in each meeting; the meeting notice, agenda notice, agenda notes, audit report, and other project reports and documents should also be well maintained. The members should be informed well in advance and through personal contacts should be persuaded to participate in meetings. Officials from the co-operative department, co-operative bank, rural development department, panchayat, self-help group organisations and other concerned agencies which have a linkage with the co-operative, should be invited in meetings as guests and speakers. Their advice would be valuable in reaching proper decisions. Such a step also strengthens co-operatives relations with local bodies and financial institutions. Co-operatives are people-centered rather than capital-centered organisations. Therefore, training and extension is the most appropriate tool for developing the co-operatives' most valuable asset.

Co-operatives, especially the village level fishermen co-operatives, should diversify their business. They should not restrict only to fishing and selling. There are number of business avenues related to fishing business including fish processing, ice packing, net making, which should be explored by them. In the diversification of business women are known to have played significant roles. They can undertake activities like bee-keeping, livestock development, dairying, poultry, handicrafts, food preservation and processing on their own or through their self-help groups. Co-operatives can support them by providing technical support, market place and market information.

5.11 Credit System

The Indian Financial System broadly consists of two segments, formal and informal credit sector. The informal credit market in India is more visible in the rural areas. Lamberte (1987) classified informal credit markets into mainly five sub-sectors: Rosca, landlord moneylenders, traded miller moneylenders, farmer lenders and professional moneylenders. Kwack et.al. (1981) classified the rural credit markets into friends, relatives and neighbours, farmers, landlords, input dealers, output dealers, professional money lenders, pawn shops and Rosca. In rural areas most common source of getting loans are bank, money lenders and cooperatives.

A loan is a type of debt. Like all debt instruments, a loan entails the redistribution of financial assets over time, between the lender and the borrower. In a loan, the borrower initially receives or borrows an amount of money, called the principal, from the lender, and is obligated to pay
back or repay an equal amount of money to the lender at a later time. Typically, the money is paid back in regular installments, or partial repayments; in an annuity, each installment is of the same amount. The loan is generally provided at a cost, referred to as interest on the debt, which provides an incentive for the lender to engage in the loan. In a legal loan, each of these obligations and restrictions is enforced by a contract. In India sources of the loans can be categorized into formal and informal sources. Formal sources of loan can be received from commercial banks, regional rural banks, cooperative credit societies, whereas, Informal sources of loan are friends and relatives, moneylenders.

Credit does not necessarily require money. The credit concept can be applied in barter economies as well, based on the direct exchange of goods and services (Ingham 2004 p. 12-19). However, in modern societies credit is usually denominated by a unit of account. Unlike money, credit itself cannot act as a unit of account. Source of financial support was studied during the research to understand the credit structure in the area.

The modern banking system in India started in the colonial period. The Reserve Bank of India was established in 1935 and it was nationalized in 1949. In the colonial period the moneylenders were the main source of rural credit. The spread of banking system during that time was very limited. Rural credit disbursement of the moneylenders were characterized by high rate of interest with high exploitation of the poor. In the early 1950s it was found that the moneylenders, traders and rich landlords accounted for more than 75 per cent of rural credit (Shah, Mihir et al., 2007). The immediate action plan of the Government was to concentrate on Cooperative Credit Societies. In 1971, the share of cooperatives in rural credit rise to 20 percent (Shah, Mihir et al., 2007). But later, these cooperative societies were been seen to suffer from many shortcomings. The mutual concept between savings and credit functions, which is very important for the successful functioning of the cooperatives societies had been lacking in India. Considering these objectives the banks were nationalized in 1969. So only after 1969, the provision of credit in the countryside and to the needy was brought under a proper Government policy (Ramachandran, V.K. and M. Swaminathan, 2004). In the early 1980s employment generation and poverty alleviation were recognized as very important objectives in the Government policy. In order to benefit the weaker section of the society credit was started directing towards the intended segment of the society. Integrated Rural Development Programme, a scheme for the creation of productive income-bearing assets among the poor through the allocation of subsidized credits, started. But overall the phase between 1969 and 1990 saw unprecedented growth of commercial banking in terms of geographical spread and functional reach (Shetty,
1997 cited in Ramachandran, V.K. and M. Swaminathan, 2004). The phase of liberalization after 1991 came up with banking policy which is guided more by the market than the regulations set by the public authority. After 1990 mergers and swapping of rural branches became the norm. The share of agriculture in total bank credit has fallen from 19 per cent in 1990 to under 11 per cent in March 2005. (Shah, Mihir et al., 2007). The small cultivators were the worst affected by the post-1991 decline in credit to agriculture. In contrast advances to large cultivators have risen in the same period (Ramachandran, V.K. and M. Swaminathan, 2001, Shah, Mihir et al., 2007).

Incomes of the fishermen being seasonal, credit are needed to smoothen out the irregularity between the flow of earnings and level of expenditure. Even seventy years after independence, several rural areas in India have no guarantee of state provided education and health. The public distribution and social security systems are also weak and are backed by inefficiency and corruption. Social obligations also cast a heavy load on the fishermen. Each of the basic needs of health, education, food and social security, apart from the working capital and long-term investment requirements of rural livelihoods create a major demand for credit. One of the factors accentuating the dependency on others is that there is often intense competition amongst fishers in Chilika.

During the research an attempt was made to find out the opinion of fishermen on the availability of financial support during the need. If adequate financial support is available from reliable source, it can lead to sustainable livelihood structure in any particular society.

Maximum fishermen informed that they can easily get the loans or the financial support from money lenders during need. 78.5% of the respondents think that taking money from local Mahajan or the money lenders is most easy. 5.3% feel that getting support from bank is easier, whereas 6% feel that getting money from family members is most easy. Only 4% feel that getting financial support from government is easier and 2% feel that get it from co-operatives is easy. 3.6% however feel they can get monetary support from other sources. The study reflects that, though the fishermen have enough sources of getting financial support, but the easiest source are the money lenders. This re-establishes the notion that fishermen are prone to seasonal poverty, which leads to taking loans from various traditional money lenders, who either charge very high interest or take the fish catch against the loan. The study thus proves that credit for domestic needs and consumption is linked to the fisher's ability to repay or, rather, to the financier's perception of the fisher's ability to repay. When a fishing household borrows for domestic needs, it effectively signs away a part of its assumed earnings from the next season's fishing. Taking loans can limit marketing opportunities, as the lender may enjoy preferential
rights to the catch at agreed prices. This leads to the family being virtually bonded to a trader, with the trader becoming the de facto owner of the family's productive assets, for what they are worth.

It is thus suggested that a more formal system of credit should be established in the fishing village. This can be done by involving more number of nationalized and private banks. Even the Differential Rate of Interest scheme, which is meant to give small amount of loans with minimal interests to the poor people, can be a great help to the fishermen. Number of NGOs who are working in the sector of micro financing, can be brought in, to oversee the situation and suggest.

A boat owner indebted to a trader is vulnerable, because he is often forced to sell his catch at the rate demanded by the trader. An important indicator of poverty is the source of credit. Fishers whose only sources for loans are friends, neighbours and relatives are not sufficiently creditworthy in terms of assets or income to obtain loans from professional moneylenders and fish traders. Having an individual bank account is a sure sign of affluence, although not having an account is not necessarily a sign of poverty.

Similarly loan from money lenders was one of the indictor which was covered under this research. Schrader (1992) explained that the literature of sociology of development labeled moneylenders with two stereotypes for the most part. The first one considered them as "loan sharks" who sucked the poor and innocent peasants. The other stereotype reflected the dominant opinion in development that moneylenders were traditional forces, which prohibited progress. They had to be eliminated for the sake of rural development and replaced by banks and other formal savings and credit institutions. The positive aspects of low transaction costs and efficient operation in informal credit markets were totally dominated by the emphasis on the evil aspect of ICMs. Wai (1977) one of the first writers on ICMs estimated that informal loans were unproductive.

Lending by money lenders is an activity that antedates contemporary banking system from ancient times. They have been organized in the form of family or individual business. They vary in their size from small petty money lenders to substantial indigenous bankers whose businesses, at times, have exceeded that of commercial banks. In India, historically, money lenders have had a prominent position in the capital and credit markets. They are usually aligned along ethnic lines and are variously called as shroffs, seths, sahukars, mahajans, chettis in different parts of the country [Das-Gupta, 1990:9-12]. Money lenders lend money; act as money-changers and finance loan trade by means of bills of exchange. They usually use working capital of their own, and do not generally get deposits or solicit savings from the public.
They grant loans on personnel recommendation and guarantee to persons well-known to them. They also sometimes grant loans against securities such as gold, jewelry, land, promissory notes, etc. (Iqubal, 1988: 367-369).

Money Lenders in India come under control of the Money Lenders Act, promulgated by each of the different states. The act essentially sets out the appointment of a Registrar-General of Money-Lenders who maintains a register of money-lenders in their jurisdiction. The Registrar provides for a license to money lenders to carry out their business, regulates the terms and conditions under which a loan is provided to borrowers, and arbitrates in disputes between money-lenders and borrowers in cases of default or other aspects. Compliance with the Act is rare however, and majority of the money-lenders do not obtain such a license to operate.

Fishers are one of the most vulnerable targets and often enter into exploitative relationships with money lenders. This sometime prevents them from investing in production, or scaling up their activities. One of the most frequently observed money lending schemes is operated by intermediaries. Under this system, fishers borrow money from an intermediary to purchase or repair a boat or to stock up on food and supplies for long fishing voyages. They are then required to sell the catch to the intermediary. This acts as both principal and interest repayment. Fishers often receive credit from the same intermediaries in case of emergency to cover the expenses of marriage, to repair damaged equipment, or to purchase a new boat. Another practice is where fishermen who do not own a boat borrow the boat from a rich person. The boat owner decides whether to rent the boat out or not after reviewing the past record of the fisherman. Under the terms and conditions of acquiring the boat, the fisherman is required to provide a good amount to the owner.

During the research, it was tried to understand, whether the fishermen have taken loans from the money lenders. This will help in understanding, the livelihood condition of the fishermen, as loans are taken during need and if a fisherman has taken loan, he must be facing financial scarcity. The high interest rate and keeping some assets under securities also make the fishermen more vulnerable. The traditional money lenders follow traditional methods of keeping accounts and do not give receipts. At the same time they also charge high rate of interests in proportion to banking institutions. Therefore it is clear that the fishermen can be trapped anytime, by the money lenders.

The research observed that around 50% of the respondents have taken loans from the money lenders, whereas the other 50% have so far not taken any loan from the local money lenders. This proves that the fishermen seek financial support during crisis. This depends on the
seasons and the catch. Most of the time they also take financial support for the social needs like for marriages and festivals. Sometimes they seek financial support for buying fishing equipment including boats and nets. The financial support from the banks comes with low interest rates, but the informal money lenders usually charge more interest. Many a time fishermen are forced to deliver the catch to the money lenders in exchange of the interest. This however, puts them in a more vulnerable situation. The traditional fishermen from Chilika have little say on the price of their catch in the market. They have become hostages in the hands of money lenders who advance funds to them for their boats, nets and other needs. These moneylenders now control the fishing market, alleges Kanda Allaya, Sarpanch of Bhusandpur village of Khurda. Most of the loans taken by the fishermen are from private money lenders rather than nationalised banks. The gruesome paper work and need of a land patta make most fishermen unsuitable for loans from nationalised banks.

During the study the researcher identified, the informal credit structure with high interest rate from the money lenders to be one of the biggest bottlenecks in shaping the fishing community's long term livelihood. However, while discussing this issue with some of the elder fishermen; the researcher learnt that despite of the high interest rates the fishermen preferred borrowing money from money lenders rather than formal institutions. This was because the credit provided by money lenders is timely available when it is most needed. The money lenders also do not maintain regular business hours, and usually work throughout the day, thus making themselves available to the local fishermen at any time. At the same time the money lenders are easily accessible, being from the same locality. This was an interesting outcome of the discussion and this could not have been come out if the researcher would not have tried to go deep into it. While interacting with a local money lenders and knowing that they maintain a close relation with the fishermen which is important in case of financial transactions, further supported this finding. This interesting fact could be brought out because of the use of triangulation method.

People who belong to the lowest income group spend most of the income on food. It is true that mere extension of financial services to the poor fishermen will not reduce poverty. The purpose of the loan (i.e., for what purpose the loan is used), the literacy level of the head, availability of non-farm employment opportunities in surrounding area also play an important role in it. Fishing households with improved access to credits will be in a better position to adopt technology, increase their incomes, and improve quality food intake than those who do not have access to credit.
It is therefore proposed that government should ensure better financial services for the fishermen who are in need. The financial services can be provided by establishing grameen (village) banks and cooperatives. More number of small fishermen associations can be created and can be linked with micro finance. The financial services must be complemented with other services like improving access to basic literacy level, nutrition and health care. This will not only ensure a healthy financial structure within the fishing community, but will also ensure that the fishermen have alternate livelihood options through linkage to effective credit structure in the area.

Whether the fishermen purchase their equipments on loan or credit was ascertained through interviews. Credit is the trust which allows one party to provide resources to another party where that second party does not reimburse the first party immediately (thereby generating a debt), but instead arranges either to repay or return those resources (or other materials of equal value) at a later date. The resources provided may be financial (e.g. granting a loan), or it may consist of goods or services (e.g. consumer credit). Credit is extended by a creditor, also known as a lender, to a debtor or borrower. Credit, in commerce and finance, is a term used to denote transactions involving the transfer of money or other property on promise of repayment, usually at a fixed future date. The transferor thereby becomes a creditor, and the receiver becomes a debtor; hence credit and debt are simply terms describing the same operation viewed from opposite standpoints.

Many credit systems have been set up with development motives i.e. to reduce the dependence of the poor on moneylenders, trader-financiers and middlemen. The difference between formal and informal systems of credit delivery is that in the formal system once credit is given it is expected to be repaid regardless of the ability of the debtor to repay. Informal systems on the other hand, being more commercially oriented, ensure that fishers continue fishing to be able to repay their loans and the sizeable interest on them.

In India during the early 1980s the Agricultural Refinance and Development Corporation was converted into a separate bank known as the National Bank for Agriculture and Rural Development (NABARD) to refinance entire credit packages for agriculture, rural and village industries. Until very recently, however, growth processes in rural credit excluded artisanal marine fisher folk. The traditional cooperative system was not successful among fisher folk, nor did it emerge as a viable form of organization. Commercial banks with very few exceptions did not have the required expertise and had no focus on artisanal fishing. The reasons for this include the remote location of fishing villages and the low social status of fisher folk and fishing
compared to agriculture. Only during the past ten years have some artisanal fisher folk been included in credit schemes under rural development programmes.

Most of the time fishermen buy either the boats or net for fishing. In addition they also buy other things like ice, baskets for fish storing purpose. It is therefore necessary to establish a system of purchase of fishing equipment on credit with very flexible conditions, without which the fishermen can get into the trap of money lenders.

71% fishermen do not buy any equipment (fishing) on credit, whereas only 30% fishermen buy the fishing equipment on credit. This proves that probably because of high interest rate or lack of credit structure the fishermen do not buy the equipment in credit. The other reason, which can lead to this situation, may be either a small price of the equipment, for which the fishermen do not require loans or a very high prices, for which they do not take the risk to take loans. It has also been proved that as maximum number of fishermen work for crews of other's boat, they do not buy their own fishing instruments, like boats and nets, rather the basic things are provided by the boat owners. However this clearly reflects a market without proper credit linkage and subsidies for the fishermen.

Providing credit at concessional rates should be one of the important elements of the strategy for deployment of rural credit. The justification for offering credit at concessional rates to fishermen should be based on the argument that farm based investment activity in the short run does not always yield a return which enables regular servicing of loans and at the same time meet the minimum consumption requirements. The soft loans with minimum interest can help fishermen to have their own equipment including fishing gears, nets. Though the study did not cover the banking facilities in the region, it is true that commercial banks being more focused on profitability tend to cherry pick and give comparatively less priority to rural areas.

Moneylenders, who advance funds for mechanised boats usually hold claim to almost all the fish catch from these vessels. This leads to a situation wherein trade in fish is being increasingly controlled by a handful of powerful individuals, or their agents. In this situation they can literally dictate the price of fish, by controlling the auction mechanism or by demanding the entire catch for the funds already advanced. The middlemen in trading of fish products also exploit the gullible fishermen by making payments once in a fortnight or month. But they get payments from the higher-up in the trading network at least twice a week. "In a way they reinvest the money meant for payment of fishermen as loans," alleges Mr. Panda from Mahisha village. This can only be checked, if proper mechanisms of providing loans are available.
Similarly, whether the fishermen provide credit to their customers was ascertained during the research. Credit by definition means the ability to obtain goods or services before payment, based on the trust that payment will be made in the future. The Indian Financial System broadly consists of two segments - Formal and Informal credit sector. The informal credit market is an important part of the financial system of the Indian society. They play a decisive role in channeling credit to small and poor borrowers in both urban and rural areas. They also constitute an important source of working capital of all sizes and serve generally to ameliorate inefficiencies in the allocation of formal sector credit. There are two views concerning the importance of the informal credit markets viz. Traditional view and Modern view. As per traditional views informal finance was often thought to be anti-developmental, exploitative, and prone to consumption rather than investment behavior and incapable of expanding to provide an appropriate volume and range of financial services (Pischke et al., 1983). However the modern view looked more sympathetic than the traditional one. UNDP (1997) study made it clear that informal credit market works directly in the community and had simplified application procedures, quickness in extending credit, focus on the local market, providing larger loans based on successful repayments, charge high rate of interest, addressing the need of the poor clients and consider reputation in the community as more important than collateral.

In Chilika traders advancing money to fishers in return for fish is an old tradition. However, most of the time fishermen also give credit to the customers against selling their catch. In this case credit is linked to the buyer’s ability to repay or, rather, to the fishermen’s perception about the buyer’s ability to repay. While giving credit, it is sometimes anticipated that the credited amount is not been repaid and thus become a bad debt. In case of fishermen, if he gives a huge amount of credit, it may so happen that, he has himself to take loan for his own survivals. Therefore during the research, it was tried to understand, whether the fishermen give credit to the customers, whom they usually sell their fish.

52% respondents replied that they do not give credit to the customers, whereas 48% give credit to their customers. This proves that there has been an important change in the fishing sector regarding the increasing monetization of transactions. With the arrival of outsiders, fishers cannot afford to, or do not need to, sell their fish on credit. Even local buyers now need to carry cash in hand to pay for fish purchases. The monetization of transactions also means that many social activities such as helping out with net mending or in fish processing have become paid jobs. This also re-establishes the notion that, as the fishermen get loans from the money lenders, they sell their catch to them only, left with limited scope to deal in the open market.
Social relations in a fishing village traditionally influenced economic activities. For instance, fishers would generally sell their fish to women processors and traders. On special occasions, fishers would give time to the processors dry fish and take it to the market for sale before expecting to be paid. In effect, then, processors did not need to invest anything up front. Similarly the processors give the dry fish or the processed fish to the shopkeeper without any expectations and get the money after sale of the fish. Without the formal credit linkage, this whole social structure will be in distress. The traditional credit structure at the fishing village symbolizes a value chain, which usually results in setting up a strong bondage between the communities. Proper channel of credit among the community members can ensure livelihood for many and most importantly the women and most disadvantaged in the area, which usually do not have any capital. Ensuring flow of credit should enable marginal and oppressed sections of the village communities (landless, small and marginal farmers, women) to gain maximum benefit. However, existing power relations based on caste, class and gender differences need to be addressed in order to offer improved livelihood opportunities of poor households in the fishing village. As already proved, this should be regulated by the community members themselves; however, in any case this should also be facilitated by external agencies like NGOs.

On the other hand whether the fishermen charge extra money for giving credit to their customers was ascertained during the research. Credit markets have, historically, played a crucial role in sustaining growth in almost all countries, including advanced countries, which now have fully developed capital markets. Credit markets perform the critical function of intermediation of funds between savers and investors and improve the allocative efficiency of resources. Banks, which are key players in the credit market, play an important role in providing various financial services and products, including evading of risks. Credit markets also play a major role in the monetary transmission mechanism. Extension of credit, however, also poses some risks, which range from pure credit risk to the risk of over-lending. Pure credit risk is the risk of loss due to non-payment by the borrower, even though adequate precautions are taken at the time of loan origination. The risk of over-lending arises when the credit provider extends loan without appropriate credit appraisal and due diligence on account of excessive optimism for future prospects.

Credit markets in developing countries, in particular, play an important role, where apart from industry; farm sector is also important segment of the economy. The rural market sector of India, which is not always able to access the capital market, depends on the credit for their
survival. During prehistoric time when there was no currency system the India economy system followed barter system for trading i.e. the excess of agricultural produce were exchanged against other items. The agriculture produce and system in India are varied and thus offers a wide agricultural product portfolio.

During economic transaction, interest rates are decided between the giver and taker, or in case of formal system, interest rates are pre-decided. This is not applicable in case of exchange of food items. The whole supply system in the rural areas is systematic. While most of the small grocery shops and vendors are from the same locality, items are provided in credit with a proper account keeping system. The rural families usually pay the amount in a periodic basis, mostly weekly or monthly. The shopkeepers usually charge a small amount on credit, which is negligible.

This system of transaction is common in the villages of Odisha. As already discussed, social relations in fishing village traditionally influences the economic activities. Question was therefore asked to ascertain whether the fishermen charge some extra money for giving credit? While it is revealed that the fishermen give a small interest on the money that they borrow from the middlemen, it is indeed important to understand, whether they take extra amount, and provide the catch in credit.

The study reveals that 87% of the respondents do not charge extra for giving credit, whereas only 13% charge extra for giving credit. This proves that credit in the fish business is not linked to interest and is more of informal. Fish has a diminishing value, if not sold fresh thus; fishermen are bound to sell them on credit. Similarly the fish workers involved in production and trading operations that require investments, the returns from one cycle of operations finance to the next. This means the fishermen often have no option but to sell their products at whatever price is offered, rather than waiting for a better opportunity. The study reflects that while maximum numbers of fishermen actually sell their fish to the middlemen, the rest, who are independent, have to sell it in the open market with credit and without interest.

While it is difficult to ensure that fishermen get some extra amount on the credits that they give, it is important to ensure that they sell their catch in proper price. It will be helpful for fishermen to keep sources like mobile phones, so that they get to know the supply and demand of fish in different landing centers and which market to go to when they return with their catch. This will ensure that they get the appropriate returns on their catch and do not lose anything on the ground of credit. Some of the fishermen population may not have access to a particular income generating activities because they lack the required capital or assets to establish an exchange
relationship with the institutional counterparts related to that channel. For them market linkage will be one of the most important issue.

5.11 Overview

The household assets, animal assets and land holding pattern possessed by each family were observed through interview method. The study gives a mix picture in terms of land holding pattern. In terms of agricultural land, only 31% fishermen have agriculture land more than 10 dc. This means this section of fishermen can make income out of agriculture. The fishermen who have smaller patch of land should also be supported for aquaculture. Similarly the study proves that the fishermen do not have enough animal assets as an alternate livelihood option. It is desirable that some successful SHG's income generations' activities be strengthened through providing them animal assets. Government subsidies should be provided to fishermen for buying cows, doing poultry, duckery, etc. so that the fishermen have a steady income even during distress. Fishermen will be able to have the access to the assets, when they will have steady income.

32% fishermen spend more than 8 hours in the lake for fishing which reflects that while the fishermen goes in the sea for fishing, they take a longer period for returning back, which affects both their mental and physical health. It is therefore essential to ensure, the fishermen get time to take a break, which will not only ensure a healthy life, but will increase productivity.

63% of fishermen sell their catch through some middlemen. There are number of fish collection boats operated by whole sellers in Chilika who also collect the catch from the fishing boats inside the lagoon. Identifying and linking poor primary fishermen to productive opportunities in the fishing and fish sub-sectors can significantly increase incomes as they access high-value markets and sell value added produce. The five key sectors which need to be focused are developing input supply chains, promoting productive technologies, private sector-led training, adding value and linking producers to markets. This along with proper credit system by the government can ensure that the fishermen have their own market linkage and have a better income. Similarly, maximum numbers of fishermen sell their fish directly in the market or to the middlemen and do not depend solely on the godown to store their fish. It is important that the fishermen should have access to better storing facilities, so that the fish does not lose its quality. This is essential to prevent loss, maintain high quality and realization of better price and CDA should initiate to supply highly efficient Insulated Fish Boxes to Chilika fishers having their own fishing boats.
Maximum numbers of respondents feel that the local fish farms never care about the local people and keep their own people. This proves that the local fishermen who have limited opportunity to be engaged in their areas, becomes even more vulnerable. Therefore enough stress should be given for the fishermen who are poor and vulnerable from economic point of view. The local Panchayati Raj members should be involved in the process of engaging these fishermen. It was also proved that the big exporters came into the scene only after the shrimp export markets began to grow. The hierarchy begins with traders, who deal in export varieties of fish, and proceeds downwards to the petty fish traders. It is suggested that increasing economic growth rates for a particular section of people is essential but it is not enough. The quality of economic growth, its sustainability, composition and equity is equally important. Therefore government should put focus on minimizing the gaps between the so called rich exporters and the traditional poor fishermen. It should also strictly review the tax aspects from fish export point of view. The collected tax can be used for the welfare of the local fishermen.

The study also revealed that 95% fishermen are not aware of the major government schemes for the fishermen, which makes them even more vulnerable during the crisis and may not get adequate facilities during need. It is therefore important that the fishermen be empowered with information on their legal and constitutional rights, entitlements (benefits from government schemes) and accountability mechanisms such as grievance redressal and the Right to Information Act.

There are number of areas, which require technical support from government. Value addition for fish catches is one of the areas, which needs to be effectively introduced with technical support. Sometime the fishermen also seek technical support for using new technologies including fishing gears, motorized boats, etc. Similarly in several places the SHGs in the fishermen villages need technical support from the government to start different Income Generating Activities (IGAs). Chilika Development Authority (CDA) should take a lead role to promote awareness of fishers for conservation and sustainable use of fishery resources, and also to establish a system of support and collaboration among stakeholders and government agencies.

The study reveals that 89% fishermen are not trained on any particular subject related to fishing. With the modern technology being in the market, without proper training, fishermen may find themselves obsolete in future. This will also decrease their productivity and will impact their livelihood. The most important training programme, for the fishermen are post-harvest handling and preservation techniques. This training is not only important for the fishermen but also for the fishing women. They should also be trained to identify various types of fish, from brackish water,
and which kind of fishing resources can be exploited at what time of the year. Similarly training should be provided on the sustainable ecotourism in Chilika. Villagers adjacent to Satapada, Sipakuda, Mirzapur, Gabakunda and Gangadharapur are involved in tourism and therefore the training programme will help sensitize the boat operators on sustainable eco-tourism, dolphin conservation as well as promoting nature-based tourism as an alternate source of livelihood.

The study observes that the fishermen feel the importance of the formation of traditional fishermen's association to further strengthen their voice against their demands. In view of the constant threat from the outsiders and big businessmen, the need of traditional fishermen's association becomes even much stronger. It is thus suggested that the already existing association should have the power to plan and implement conservation measures collectively. Regulation for the entry of non-fishers and identification/registration of all local fishers with issue of identity cards can help to improve the situation. Similarly, the complexity and dynamics of wetland ecosystem like Chilika demands a robust work organisation and therefore CDA should focus more on the socio economic issues and should try and correlate the environmental issues with it and not vice versa. CDA must ensure that the lake must not be used for 'culture fishing'. The interest of the poor and the marginalized fishing communities who are its inhabitants since centuries must be taken into consideration. Common property like Chilika Lake is of central importance to the fishermen, and should be an important part of development strategies.

It is also suggested that government should ensure some restrictions for the fishermen in order increase in fish catch and safety of environment. For auto migration of juveniles and fish from the Bay of Bengal to the lagoon, the sensitive areas, such as outer channel, Magarmukh channel, Palur canal should be prescribed as no fishing zone and use of any type of nets and more specifically Khanda in these areas need to be strictly prohibited. As the study proves that fishing in Chilika is generational, without having a constant supply of fish, they are susceptible to falling into the trap of poverty. In order to address the challenge of sustainable livelihood, there is a requirement of structured investigation to understand the root causes of poverty in the wider context as well as within the core of fishermen's livelihoods.

The study reflects that number of fishermen cooperatives exists in Chilika. Primary objectives of these cooperatives are to protect the interest of Chilika. In the villages in which field research was conducted, cooperative societies seem to have been confined to paper and to a handful of people with strong decision-making powers in the community. Regular meetings should be held in accordance with the procedures laid down in the byelaws of the co-operative. Officials from
department, and other concerned agencies which have a linkage with the co-operative, should be invited to meetings as guests and speakers.

The study reflects that, though the fishermen have enough sources of getting financial support, however the easiest source is to get from the money lenders. 78.5% of the respondents think that taking money from local mahajan or the money lenders is most easy. At the same time, the research observed that around 50% of the respondents have taken loans from the money lenders. This re-establishes the fact that when a fishing household borrows for HH needs, it effectively signs away a part of its assumed earnings from the next season's fishing. Taking loans can limit marketing opportunities, as the lender may enjoy preferential rights to the catch at agreed prices. It is thus suggested that a more formal system of credit should be established in the fishing village. This can be done by involving more number of nationalized and other banks. Even the Differential Rate of Interest scheme, which is meant for giving the poor people loans of small amount to the poor people with minimum interest, can be a great help to the fishermen. However, mere extension of financial services to the poor fishermen will not reduce poverty. The purpose of the loan (i.e., for what purpose the loan is used), the literacy level of the head, availability of non-farm employment opportunities in surrounding area also play an important role in it. It is proposed that government should ensure better financial services for the fishermen who are in need. The financial services can be provided through establishing grameen (village) banks and cooperatives.

Because of high interest rate or lack of credit structure the fishermen do not buy the equipment in credit. It is also been proved while maximum number of fishermen work as crew in other's boat, they do not buy their fishing instruments, like boats and nets, rather provided with the basic things by the boat owners. Providing credit at concessional rates should be one of the important elements of the strategy for deployment of rural credit. The justification for offering credit at concessional rates to fishermen should be based on the argument that farm based investment activity in the short run does not always yield a return which enables regular servicing of loans and at the same time meet the minimum consumption requirements. The soft loans with minimum interest can help fishermen in having their own equipment including fishing gears, nets.

However, there has been an important change in the fishing sector regarding the increasing monetization of transactions. With the arrival of outsiders, fishers do not sell their fish on credit. Even local buyers now need to carry money in hand to pay for fish purchases. The monetization of transactions also means that many social activities such as helping out with net mending or in
fish processing have become paid jobs. The traditional credit structure at the fishing village symbolizes a value chain, which usually results in setting up a strong bondage between the communities. Proper channel of credit within the community members can ensure livelihood for many and most importantly the women and most disadvantaged in the area, who usually do not have any capital. Thus the existing power relations based on caste, class and gender differences are need to be addressed in order to offer improved livelihood opportunities to poor households in the fishing village. The study also reveals that 87% of the respondents do not charge extra for giving credit. This proves that credit in the fish business is not linked to interest and more of informal. Fish having diminishing value, if not sold fresh, fishermen are bound to sell them on credit. This means the fishermen often have no option but to sell their products at whatever price is offered, rather than waiting for a better opportunity. The study reflects that while maximum numbers of fishermen actually sell their fish to the middlemen, the rest, who are independent, have to sell it in the open market with credit and without interest. It is therefore important to ensure that the fishermen sell their catch against proper price. Fishermen should be advised to keep mobile phones, so that they get to know the supply and demand of fish in different landing centers and which market to go to when they reach land.

The following framework describes the outcome of this chapter.
The fishery livelihood suffers from multiple issues, including poor asset base, improper government structure, poor credit structure and lack of knowledge. In order to meet these challenges, four key factors are required, knowledge base, physical base, socio-economic base and legal base. Each of these bases need further support with proper planning and monitoring and also inter-related. Ultimately these four bases will result in economic upliftment through better credit provision, market linkage, capacity building and Govt. support.

The next chapter discusses about the Environmental Issues and Natural Disasters and its impact on the livelihood of fishermen in the area.