CHAPTER VI

IMPACT STUDY OF SELECTED SAMPLE
FISHERY POPULATION - BASED ON
PRIMARY DATA
In the two coastal districts of the state, Dakshina Kannada and Uttara Kannada, the former is leading in the fishery activities with a higher production and wider area of operation and a full time active fishermen of about 9,500 whereas the latter district has only about 8,200 active fishermen. Part-time fishermen engaged in fishing activities in Dakshina Kannada is worked out to be 4,000 and in Uttara Kannada it is around 1,500 fishermen. Occasional fishermen in the former district is about 1,000 and in the latter it is 800.

The fishing villages in both districts are 86 and 118 each with a total fishing village of 204. These two coastal districts have the following distribution of fishermen engaged in fishing (Table 6.1).

**TABLE 6.1**

**DISTRIBUTION OF FISHERMEN ENGAGED IN FISHING IN COASTAL DISTRICTS OF KARNATAKA STATE**

<table>
<thead>
<tr>
<th>Fishermen engaged in actual fishing</th>
<th>Dakshina Kannada</th>
<th>Uttara Kannada</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Full time</td>
<td>9502</td>
<td>8162</td>
<td>17664</td>
</tr>
<tr>
<td>2. Part time</td>
<td>4014</td>
<td>1544</td>
<td>5558</td>
</tr>
<tr>
<td>3. Occasional</td>
<td>975</td>
<td>808</td>
<td>1783</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14491</strong></td>
<td><strong>10514</strong></td>
<td><strong>25005</strong></td>
</tr>
</tbody>
</table>

Source: Computed data.
The main landings centres in the above districts are 12 and 16 each and, the sample selected fishermen in these main landing centres are 10 each. Hence the total number of sample fishermen in both districts are 120 and 160.

In Uttara Kannada district, the 16 major fishing centres are Majali, Karwar, Binaga, Arga, Chendia, Kodar, Harwada, Keni, Gangavali, Tadri, Kumta, Honnavar, Manki, Murdeshwar, Shirali and Bhatkal. Fishing activities in this district is more concentrated in the landing centres like Karwar, Bhatkal, Honnavar and Tadri. Above 78 percent of the catch in this district is from the above four landing centres. The remaining important landing centres share the rest of the quality of catch in the same district.

In the primary data analysis only the full time fishermen engaged in actual fishing are taken into account and the remaining part time and occasional fishermen engaged in actual fishing do not come under the purview of the analysis.

The twelve major fishing centres in Dakshina Kannada district are Ullal, Mangalore, Mulki, Kulai, Pollipu, Udayavar, Malpe, Hungarcutta, Gangolli, Beejadi, Navunda and Tarapathy. Among the above twelve important fishing centres, Mangalore and Malpe occupy the prime place.
in the total landings of the fish. The fishing activities are also greatly centered there and more than 78 percent of the catch is from these two centres in the same district.

6.1.0 MARINE FISH CATCH IN TERMS OF QUANTITY IN SELECTED DISTRICTS AMONG SAMPLE FISHERMEN

The selected sample study area of the marine landing centres a total 2980 metric tonnes of fish was landed by 280 fishermen. In the 12 main landing centres of Dakshina Kannada district 120 fishermen had a total landings of 1860 metric tonnes of fish which account for 62.42 percent of the total catch, whereas in the 16 main landings centres of Uttara Kannada district 160 fishermen had a total catch of fish weighing 1120 metric tonnes i.e. only 37.58 percent of the total catch.

The production of fish by the sample fishermen includes all varieties of fish during the period 1990-91 (Table 6.2).

<table>
<thead>
<tr>
<th>Features</th>
<th>Dakshina Kannada</th>
<th>Uttara Kannada</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No. of sample Fishermen</td>
<td>120</td>
<td>160</td>
<td>280</td>
</tr>
<tr>
<td>2. Production in Metric tonnes</td>
<td>1860</td>
<td>1120</td>
<td>2980</td>
</tr>
<tr>
<td>3. Productivity per Fishermen Mt.</td>
<td>15.5</td>
<td>7.0</td>
<td>10.64</td>
</tr>
</tbody>
</table>

Source: Computed Data
The average productivity per fishermen in Dakshina Kannada is highest with 15.5 metric tonnes whereas in the Uttara Kannada district it is 7 metric tonnes and the total average productivity is 10.64 metric tonnes. The productivity is more than double in the former district and hence there is more concentration of fishing activities in the same district.

The present productivity is below the potential productivity per fishermen and also per square kilometer area of operation. The average potential productivity is estimated as 24.06 metric tonnes per full time marine fishermen. Here the actual catch is much lower to this estimated potential, that clearly indicates the scope for further catch.

6.2.0 MARINE FISH CATCH POTENTIAL IN SELECTED SAMPLE DISTRICTS

The primary data analysis in respect of production in both districts shows the gap of potential productivity and the actual productivity. In case of Dakshina Kannada district nearly 64.42 percent of the potential is being tapped whereas in Uttara Kannada only 29.09 percent of the potential only is being tapped so far.

The 280 total sample fishermen in both districts had fished an area of 142.80 sq. kilometers. But the total potential area that could have been exploited remains to be
In the above table the gap between potential production and actual production is identified as 35.57 percent in Dakshina Kannada district and 70.91 percent in Uttara Kannada district among selected sample fishermen.

Similarly the area under operation for the harvest of marine fish also lies below the potential area. Offshore fishing activities are yet to gain momentum due to technical and man power bottlenecks. The following table exhibits the potential and actual marine waters for the harvest (Table 6.4).

**TABLE - 6.4**

**DIFFERENCE BETWEEN THE POTENTIAL AND ACTUAL AREA UNDER MARINE FISHING IN THE SELECTED SAMPLE LANDING CENTRES BY THE SAMPLE FISHERMEN IN BOTH DISTRICTS**

(Area square kilometers)

<table>
<thead>
<tr>
<th>Features</th>
<th>Dakshina Kannada</th>
<th>Uttara Kannada</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No. of sample fishermen sq.km</td>
<td>120</td>
<td>160</td>
<td>280</td>
</tr>
<tr>
<td>2. Potential area fishing sq.km</td>
<td>591.60</td>
<td>788.80</td>
<td>1380.40</td>
</tr>
<tr>
<td>3. Actual area of fishing sq.km</td>
<td>61.20</td>
<td>81.60</td>
<td>142.80</td>
</tr>
<tr>
<td>4. Gap between 2 &amp; 3 sq.km</td>
<td>530.40</td>
<td>707.20</td>
<td>1237.60</td>
</tr>
</tbody>
</table>

Source: Computed from primary data

From the total potential area under marine fishing only a little above 10 percent of the potential area remains untapped so far.
6.3.0 THE QUANTITY AND VALUE OF MARINE FISH FROM THE SELECTED SAMPLE FISHERMEN

Among the selected sample fishermen in the selected landing centres the quality and value varied in both the marine districts. Though the catch is high in Dakshina Kannada district, average value of the fish is highest in pollipu where the quantity of the catch is low.

The quantity and value of the marine catch by the sample fishermen in Dakshina Kannada district are 1,860 metric tonnes and Rs. 60.45 lakhs (Table 6.5).

<table>
<thead>
<tr>
<th>No. of Fishermen</th>
<th>Quantity in Metric tonnes</th>
<th>Value in lakh Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>1860</td>
<td>60.45</td>
</tr>
</tbody>
</table>

Average value 0.50

Source: Computed data.

Similarly the quantity and value of marine fish in Uttara Kannada by the selected sample fishermen are 1,120 metric tonnes and Rs. 53.20 lakhs (Table 6.6).
TABLE - 6.6

QUANTITY AND VALUE OF CATCH AMONG SAMPLE FISHERMEN OF
UTTARA KANNADA

No. of Fishermen | Quantity in Metric tonnes | Value in lakh Rs.
-------------------|--------------------------|------------------
160                | 1120                     | 53.20

Average value     |                          | 0.33

Source: Computed data.

From the above tables the average income of the fishermen is more in Dakshina Kannada District than in Uttara Kannada district. The concentration of fishing activities are more in the former district.

In the latter district Karwar and Honnavar are leading in production followed by Tadri and Bhatkal. In terms of the average value of the fish in the period 1990-91 Binaga landing centre stands first followed by Gangavali and Kumta. The average value of Binaga landing centres catch is a little above Rs. 7000/- per tonnes followed by Gangavali (above Rs. 6000/- per tonnes) and Kumta (above Rs. 54,000/- per tonnes).

In Dakshina Kannada District the landing centre fetch the maximum average value is Pollipu in the same year that comes to more than Rs. 10,800 per tonne. Kulai landing centre comes next with an average value of more than Rs. 7,100 per tonne followed by Mulki Rs. 6,400/- per tonne,
Hungarcutta Rs. 6,000/- per tonne and Ullal Rs. 5,400/- per tonne. The value of the catch vary depending on the variety of the fish harvested by the fishermen and also due to the type of capital, especially gear used in harvesting the resources. In all the landing centres the average value differ due to both technical and natural reasons. Changes are also noticed year wise as well as season wise. It is difficult to exactly evolve as to how these changes are taking place. Thus the quantity and value of marine catch vary widely due to several factors.

6.4.0 MARKETING OF MARINE FISH - CHANNELS

Of all varieties of fish harvested by the sample fishermen in both coastal districts of the state, the marketing of fresh occupies an important place. Around 50 percent of the total catch is being marketed as fresh. The next channel of disposition is in the form of curing. Freezing of the catch of the sample fishermen in Dakshina Kannada and Uttara Kannada is 4 and 7 percent respectively. The catches in both districts are being marketed for canning deduction, fishermen and other miscellaneous uses.

The total catch of 1860 metric tonnes of fish by the sample marine fishermen in Dakshina Kannada marketed the same by disposing 43 percent as fresh (799.8 Metric tonne) and 30 percent of the catch consisting of 558 metric tonnes of fish is marketed for curing. 74.4 metric tonnes of fish,
i.e. 4 percent of the total catch is used for freezing and an equal amount is also used for reduction. Of the total catch 2 percent is marketed for canning which is 37.2 metric tonnes of fish. Fish manure and miscellaneous account for 3.5 and 1.35 percent which is 65.1 and 251.1 metric tonnes respectively (Table 6.7).

### TABLE - 6.7

**DISPOSITION OF CATCH BY SAMPLE FISHERMEN IN DAKSHINA KANNADA DISTRICT 1990-91**

<table>
<thead>
<tr>
<th>Features</th>
<th>Quantity in Metric tonnes</th>
<th>Percentage of disposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of sample fishermen</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Total catch (t)</td>
<td>1860</td>
<td></td>
</tr>
<tr>
<td>Disposition (metric tonnes)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>1. Marketing fresh</td>
<td>799.8</td>
<td>43</td>
</tr>
<tr>
<td>2. Curing</td>
<td>558</td>
<td>30</td>
</tr>
<tr>
<td>3. Freezing</td>
<td>74.4</td>
<td>4</td>
</tr>
<tr>
<td>4. Reduction</td>
<td>74.4</td>
<td>4</td>
</tr>
<tr>
<td>5. Canning</td>
<td>37.2</td>
<td>2</td>
</tr>
<tr>
<td>6. Fisher manure</td>
<td>65.1</td>
<td>3.5</td>
</tr>
<tr>
<td>7. Miscellaneous</td>
<td>251.1</td>
<td>13.5</td>
</tr>
</tbody>
</table>

Source: Computed from primary data.
### TABLE 6.8

**DISPOSITION OF CATCH BY SAMPLE FISHERMEN IN UTTARA KANNADA DISTRICT 1990-91**

<table>
<thead>
<tr>
<th>Features</th>
<th>Quantity in Metric tonnes</th>
<th>Percentage of disposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of sample fishermen</td>
<td>160</td>
<td>-</td>
</tr>
<tr>
<td>Total catch (t)</td>
<td>1120</td>
<td>-</td>
</tr>
<tr>
<td>Disposition (Metric tonnes)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1. Marketing Fresh</td>
<td>582.4</td>
<td>52</td>
</tr>
<tr>
<td>2. Curing</td>
<td>134.4</td>
<td>12</td>
</tr>
<tr>
<td>3. Freezing</td>
<td>78.4</td>
<td>7</td>
</tr>
<tr>
<td>4. Reduction</td>
<td>28.0</td>
<td>2.5</td>
</tr>
<tr>
<td>5. Canning</td>
<td>22.4</td>
<td>2</td>
</tr>
<tr>
<td>6. Fisher manure</td>
<td>39.2</td>
<td>3.5</td>
</tr>
<tr>
<td>7. Miscellaneous</td>
<td>235.2</td>
<td>21.0</td>
</tr>
</tbody>
</table>

Source: Computed from primary data.

In Uttara Kannada district the marketing of the different varieties of fish in the marine sector is not uniform in respect of the disposition. The marketing of fresh is more in the district which comes to 52 percent of the total catch of 1860 metric tonnes by 160 sample fishermen i.e., 967.2 metric tonnes is disposed as fresh. For curing 12 percent of the catch is disposed of which comes to 223.2 metric tonnes. 7 percent of the catch is set apart for freezing i.e. 130.2 metric tonnes and 2.5 percent i.e. 46.5 metric tonnes is disposed for reduction.
Canning takes the share of 2 percent of the total catch which amounts to 37.2 metric tonnes. Fish manure accounts for 3.5 percent of the total catch (65.1 metric tonnes). Finally 21 percent i.e. 390.6 metric tonnes are marketed out of total catch for miscellaneous uses (Table 6.8).

Thus the tendency of marketing fresh fish is at a higher level as there are more internal demand for fresh fish especially in the coastal regions.

**TABLE - 6.9**

**DISPOSITION OF CATCH BY SAMPLE FISHERMEN IN BOTH COASTAL DISTRICTS OF THE STATE**

<table>
<thead>
<tr>
<th>Features</th>
<th>Dakshina Kannada</th>
<th>Uttara Kannada</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of sample fishermen</td>
<td>120</td>
<td>160</td>
<td>280</td>
</tr>
<tr>
<td>Total catch (t)</td>
<td>1860</td>
<td>1120</td>
<td>2980</td>
</tr>
</tbody>
</table>

Disposition (Metric tonnes)

1. Marketing Fresh  799.8 (43)  582.4 (52)  1382.2 (46.4)
2. Curing          558 (30)     134.4 (12)   692.4 (23.2)
3. Freezing        74.4 (4)     78.4 (7)     152.8 (5.1)
4. Reduction       74.4 (4)     28.0(2.5)    102.4(3.5)
5. Canning         37.2 (2)     22.4(2)      59.6(2)
6. Fisher manure   65.1 (3.5)   39.2(3.5)    104.3 (3.5)
7. Miscellaneous   251.1 (13.5) 235.2(21)  486.3 (16.3)

Source: Computed from primary data
The disposition of the marketing of fresh in both coastal districts combined together constitutes 46.4 percent of the total catch. 23.2 percent is marketed for curing, 5.1 percent of the total catch of both districts is set apart for freezing, 3.5 percent for reduction, 2 percent for canning, 3.5 percent for fish manure and 16.3 percent for fish manure and 16.3 percent for miscellaneous uses (Table 6.9).

Thus the disposition of the catch in both districts are almost identical with only some small difference in the percentage. There are multiple opportunities for further dispositions, if new lines of processings are taken up in the marine sector.

District co-operative Marketing Federation Ltd., (Karwar, U.K.) plays an important role in the marketing of fish especially prawn, ranging Rs. 25/- to 200 per kg. The fishermen who are members of the federation part with only 50 percent of the catch. The rest 50 percent they sell to any other private parties.

Federation to promote marketing usually gives advances around Rs. 10,000 to each members and also for buying spare parts etc. The same is recovered from the catch they give to the marketing federation. Payments usually are made once in a month by the federation.
The catch received from the fishermen is further sold to the freezing companies by the federation and usually the federation also gets the payment once in a month by the freezing companies.

The transactions are taken place in the landing centre itself. Agents of marketing federation, fishermen and freezing companies assembles every day in the landing centres. The federation collect 4 percent of the value as landing charges. Immediate transport facilities are arranged by the freezing companies.

The marketing of prawn by the federation is properly regulated with a competitive price in the market. Once in every fortnight there is a discussion on fixing the price of prawn. Representations from freezing companies, fishermen and federation jointly participate in fixing prices. The representation from fishermen side will be usually more in such discussions. Normally prices will be fixed on market demand and several other in turned and external factors. There were also instances that such discussions were broken due to lack of composition of price between fishermen and freezing owners. At such times there are severe problems for the federation to find out alternative freezing companies etc.

With all these, reasonable prices are assured to the fishermen and the federation helps to the fishermen
from the exploitation of middlemen in marketing their catch and rendering a good service in the fishery marketing. The physical flow of marine fish inside the district is concentrated to a higher level in case of fresh. Of the total catch in Dakshina Kannada district in 1990-91 around 18 percent is marketed as fresh inside the district. Similarly in Uttara Kannada district also about 20 percent of the total catches were being marketed inside the district during the same period. This shows that the demand for fresh in and around the coastal areas remains more both the districts.

6.5.0 ECONOMICS OF PONDS AND TANKS FISH FARMING BASED ON FIELD STUDY

Two inland districts of the State, Shimoga and Chickmagalur had been taken for field study to analyse the selected variables such as production of fish, productivity, cost structure, income and net returns from fish farming in the inland sectors. The selected sample districts, Shimoga and Chickamagalur are situated in the south-central part of the state (Figure 6.1) and 30 sample fishermen were chosen from each district for this study.

6.5.1 General profile of the Fishery population

Inland fishermen consists of fish farmers, fishing workers and market intermediaries dealing in fish. The profile of the fish farmers highlights their motivation for
6.5.2 Motivation

Inland fishery is no longer a profession of backward caste people, even forward communities had undertaken the venture. From the selected sample districts the result of the probe was particularly striking (Table 6.10).

**TABLE - 6.10**

<table>
<thead>
<tr>
<th>Districts</th>
<th>No. of fish farmers</th>
<th>Distribution of Fish farmers by caste(%)</th>
<th>Pond title status (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Forward B.C. SC</td>
<td>ST</td>
</tr>
<tr>
<td>Shimoga</td>
<td>30</td>
<td>91</td>
<td>09</td>
</tr>
<tr>
<td>Chickmaga-</td>
<td>30</td>
<td>23</td>
<td>60</td>
</tr>
<tr>
<td>luru</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average %</td>
<td>30</td>
<td>57</td>
<td>34.5</td>
</tr>
</tbody>
</table>

Source: Computed data.

Of the total selected sample fish farmers of 60, 57 percent belong to forward caste/communities, 34.5 percent to Backward castes, 5 percent to SC and 3.5 percent to ST category. The economic viability and quick yield in this sector had attracted and drawn many people from different walks of life to this inland fish farming. Thus the trend is that many landlord lobbies belonging to various cross section of the people had taken to this venture. The
excellent example of Shimoga district shows that 91 percent of forward class is involved in fish farming activities, whereas in Chickmagalur district the backward class predominates fish farming and nearly 60 percent of them are in the inland fishery field as fish farmers. The category belonging to SC/ST are extremely low which worked out to be an average of 5 percent from both the selected districts.

The interest evinced by the upper class strata in this field had drawn many people with a clear transition of traditional fish farming. Even without agricultural background now there is entry of many persons due to the economic viability of this emerging resources sustainable over a period of time.

6.5.3 Training

Modern inland fish farming is an advanced art compared to the traditional one and therefore, training is an important factor pursuing aquaculture in this line. Fish Farmers Development Agency had invited such training to the selected youths between the age group of 18 to 45 for a period of one month on stipendary basis. These trainees are further encouraged by loan facilities, subsidy and allotment of ponds for fish culture on lease basis. This has attracted many youths and there is an intense competition among them to get selected for the training due to such provisions.
The trainees are given subsidies at the rate of 25% and 33.33% of the total cost, to general and SC/ST categories respectively. A sum of Rs. 150/- is paid as stipend for the period of training and certain subsidy is also granted for the construction of tanks. The FFDA is undoubtedly rendering good services for the promotion of inland fishery, however there are several difficulties faced by it.

6.5.4 Lease and ownership of pond

Nearly 93 percent of the ponds are taken on lease by the fish farmers from FFDA or Zilla Parishad or Mandal panchayat. The lease amount varied from Rs. 25/- per hectare to Rs. 50/- per hectare per year depending on the location, soil and water resources of the ponds. The lease period also varied from one year to five years and most of the seasonal tanks are only for one year while perennial tanks are given for a period of 3 years and above. In Chickamagalur district some planters had constructed their own ponds for multiple purpose such as fish culture, irrigation and domestic use, for which they had availed subsidy from FFDA.

6.5.5 Economic Analysis of Fish Culture

Shimoga and Chickmagalur are the two inland districts of the state that are chosen for the field
study. It will be useful to understand the production, productivity, cost structure and economic benefits of the fish farming in the study area for evolving a suitable policy for the development of culture fisheries.

6.5.6 Fish production

Fish culture in ponds and tanks depends on the availability of seed, variety of seed, water, feed and several favourable natural conditions like soil, climate etc. More of common carp is preferred by the fish farmers in the study districts than Catla and Rohu (Table 6.11).

**TABLE - 6.11**

**FISH PRODUCTION PER POND BY VARIETY**

<table>
<thead>
<tr>
<th>District</th>
<th>No. of Farmers</th>
<th>Average pond area in hectare</th>
<th>Actual water spread</th>
<th>Fish production variety</th>
<th>Common carp</th>
<th>Catla</th>
<th>Rohu</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shimoga</td>
<td>30</td>
<td>3.63</td>
<td>2.72</td>
<td>2,450</td>
<td>1,470</td>
<td>980</td>
<td>4,900</td>
<td></td>
</tr>
<tr>
<td>Chickmagalur</td>
<td>30</td>
<td>2.75</td>
<td>2.20</td>
<td>3,300</td>
<td>1,200</td>
<td>1,000</td>
<td>5,500</td>
<td></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>30</td>
<td>3.19</td>
<td>2.46</td>
<td>2,875</td>
<td>1,335</td>
<td>990</td>
<td>5,200</td>
<td></td>
</tr>
</tbody>
</table>

Source: Computed from field survey 1990-91.

The average fish production from both the study area was 5,200 Kg including all the three major varieties of culture. The production in Chickamagalur district was more due to practice of intensive culture encouraged by
FFDA and Zilla Parishad. The production of common carp excelled, which was 3,300 Kg in Chickamagalur and 2,450 Kg in Shimoga. The average production of catla was 1,335 Kg and that of Rohu was 990 Kg.

6.5.7 Fish yield of productivity per hectare

The economic viability of fish farming depends on the yield or productivity. In an estimate of the Fishery Department, Government of Karnataka a fish farmer can get an average yield of 2,500 to 5,000 kg per hectare or even more depending on the nature of fish culture. But the yield obtained from the sample district is less than the same (Table 6.12).

**TABLE - 6.12**

**FISH PRODUCTION PER HECTARE OF ACTUAL WATER SPREAD AREA BY VARIETY IN THE STUDY DISTRICT**

<table>
<thead>
<tr>
<th>District</th>
<th>Actual water spread area</th>
<th>Fish production (hectare) by variety in hectares</th>
<th>Common carp</th>
<th>Catla</th>
<th>Rohu</th>
<th>total in Kgs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shimoga</td>
<td>2.72</td>
<td></td>
<td>900</td>
<td>540</td>
<td>360</td>
<td>1800</td>
</tr>
<tr>
<td>Chickmagalur</td>
<td>2.20</td>
<td></td>
<td>1,500</td>
<td>545</td>
<td>455</td>
<td>2,500</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>2.46</strong></td>
<td></td>
<td>1,200</td>
<td>542.5</td>
<td>407.5</td>
<td><strong>2,150</strong></td>
</tr>
</tbody>
</table>

Source: Computed from field data 1990-91.

The average yield per hectare obtained was 2,150 Kg. i.e. 1,800 Kg and 2,500 Kg in Shimoga and Chickmagalur districts respectively. Thus it was obvious
FIGURE - 6.2

KARNATAKA - MEAN ANNUAL RAINFALL

- ABOVE 4000
- 3000-4000
- 2000-3000
- 1000-2000
- 800-1000
- 600-800
- 500-600
- BELOW 500

[Map showing different rainfall zones in KARNATAKA]
that the per hectare yield was less than the estimated yield by the department of fishery. It was mainly due to inadequate water availability in ponds/tanks as a result of the outlet for irrigation and other purposes. However, the districts selected for the study come under sufficiently rain-fed area ranging from 1,000 to 3,000 mm of rainfall (Figure 6.2).

It had also been observed that the low yield was the result of the inadequate management of the sector. It was confronted with a number of problems like poaching, predators, sub-leasing etc. The potential productivity to these stretches of waterbodies really remain high if fish farming is undertaken with intensive techniques and proper management.

6.5.8 Income from fish farming

It is the income that induces every fish farmer to pursue the task of culture in this field. The gross income from the study districts is not uniform and it varying (Table 6.13).

The gross income of Rs. 47,200 stands higher in Chickmagalur than Shimoga where it is only Rs. 44,590. The gross income from common carp in both the selected districts stands highest compared to catla and rohu.
TABLE - 6.13

GROSS INCOME FROM FISH CULTURE PER POND AND PER HECTARE OF WATER SPREAD AREA IN THE STUDY DISTRICTS

(In rupees)

<table>
<thead>
<tr>
<th>Districts</th>
<th>Gross income per pond</th>
<th></th>
<th>Gross income per hectare</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Common Catla Rohu Total carp</td>
<td></td>
<td>Common Catla Rohu Total carp</td>
<td></td>
</tr>
<tr>
<td>Shimoga</td>
<td>19,600 14,700 10,290</td>
<td>44,590</td>
<td>7,206 5,404 3,787</td>
<td>16393</td>
</tr>
<tr>
<td>Chick-magalur</td>
<td>26,400 10,800 10,000</td>
<td>47,200</td>
<td>12000 4,909 4,545</td>
<td>21454</td>
</tr>
<tr>
<td>Average</td>
<td>23000 12750 10145</td>
<td>45895</td>
<td>9603 5165.5 4166</td>
<td>18923.5</td>
</tr>
</tbody>
</table>

Source: Computed from field data 1990-91.

6.5.9 Cost structure

The cost incurred by the fish farmers is calculated by taking both paid out expenses and imputed values of family inputs like labour and manures. This cost includes the different cost components such as lease rent, cost of pond preparation, seed cost, fertilizers and supplementary, feed cost and labour cost (Table 6.14).

The overall average gross cost per pond was Rs. 27,091. The preparation cost and rent is higher in Shimoga than in Chickmagalur. In Shimoga rent is worked out to be Rs. 91 whereas it is Rs. 69 in Chickmagalur. The seed cost in Shimoga is comparatively less because it has a major seed producing centre in the State. Hence the seed cost in Shimoga is Rs. 2,069 whereas it is Rs. 3,115 in
Chickmagalur. Fertilizer cost is more in Shimoga which is Rs. 8,152 and it is only Rs. 5,355 in Chickmagalur. On the contrary the feed cost is less in Shimoga, that is Rs. 5,431, the same is costed Rs. 7,646/- in Chickmagalur. Labour cost is higher in Chickamagalur i.e., Rs. 10,195 and the same in Shimoga is Rs. 8,017. The cost-wise analysis clearly indicates that the overall cost is higher in Chickamagalur than in Shimoga which are Rs. 28,320 and Rs. 25,862 respectively.

**TABLE - 6.14**

**DIFFERENT COST COMPONENTS IN THE TOTAL COST OF PRODUCTION OF FISH IN THE STUDY AREA**

<table>
<thead>
<tr>
<th>Districts</th>
<th>Rent</th>
<th>Pond</th>
<th>Seed</th>
<th>Fertilizer</th>
<th>Supply</th>
<th>Labour</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shimoga</td>
<td>91</td>
<td>1,400</td>
<td>2,069</td>
<td>8,152</td>
<td>5,431</td>
<td>8,017</td>
<td>702</td>
<td>25,862</td>
</tr>
<tr>
<td>Chikamagalur</td>
<td>69</td>
<td>1,108</td>
<td>3,115</td>
<td>5,355</td>
<td>7,646</td>
<td>10,195</td>
<td>832</td>
<td>28,320</td>
</tr>
<tr>
<td>Average</td>
<td>80</td>
<td>1,259</td>
<td>2,592</td>
<td>6,753.5</td>
<td>6,538.5</td>
<td>9,106</td>
<td>767</td>
<td>27,091</td>
</tr>
</tbody>
</table>

Source: Computed from field study 1990-91.

**6.5.10 Per Hectare cost**

The total cost per hectare is an indicator of efficiency in production or improved method of production, if
production per unit of pond size is the same in all places. However, the pond size varied from district to district. Under such a situation, average cost defined as the total cost per unit of fish pond provides a measure of productive efficiency. In the selected sample districts the cost incurred on various heads are not uniform (Table 6.15).

TABLE- 6.15

PER HECTARE COST STRUCTURE OF FISH FARMING 1991

<table>
<thead>
<tr>
<th>Districts</th>
<th>Rent</th>
<th>Pond</th>
<th>Seed</th>
<th>Fertilizer</th>
<th>Supply</th>
<th>Labour</th>
<th>Oth</th>
<th>Total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shimoga</td>
<td>33</td>
<td>515</td>
<td>760</td>
<td>2,997</td>
<td>1,996</td>
<td>2,947</td>
<td>258</td>
<td>9,506</td>
</tr>
<tr>
<td>Chikamagalur</td>
<td>31</td>
<td>503</td>
<td>1,415</td>
<td>2,434</td>
<td>3,475</td>
<td>4,634</td>
<td>378</td>
<td>12,870</td>
</tr>
<tr>
<td>Average</td>
<td>32</td>
<td>509</td>
<td>1087.5</td>
<td>2715.5</td>
<td>2735.5</td>
<td>3790.5</td>
<td>318</td>
<td>11,188</td>
</tr>
</tbody>
</table>

Source: Computed from field study 1990-91.

The overall cost per hectare is more in Chikamagalur district (Rs. 12,870). In Shimoga it is Rs. 9,506. The cost structure, therefore, vary in each district. Certain items of costs are high in one district and vice-versa.
sustained mainly due to subsidy by the FFDA and the loan facility from the bank. It is doubtful whether the same inducement of production prevails once these facilities are withdrawn. Better alternatives with higher productivity and greater income are being worked out in the sector as an experimental measure which ultimately would popularise the culture in the inland sector. Several efforts are being made to intensify the culture with a view to achieve a higher harvest in this emerging resources.

6.5.11 Profitability of fish farming

Profitability refers to net return from fish farming obtained after subtracting gross cost from gross income per pond as well as per hectare (Table 6.17).

**TABLE - 6.17**

<table>
<thead>
<tr>
<th>Districts</th>
<th>Net income per pond</th>
<th>Net income per hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shimoga</td>
<td>18,728</td>
<td>6,887</td>
</tr>
<tr>
<td>Chickmagalur</td>
<td>18,880</td>
<td>8,584</td>
</tr>
</tbody>
</table>

Average returns

| Average returns | 18,804 | 7,735.5 |

Source: Computed from field survey 1991

The net income from both the selected sample district reveals that the latter district leads in both
net income per pond and net income per hectare. The average net income from both the study districts worked out to be Rs. 18,804 and the average net income per hectare was Rs. 7,735.50.

The present yield and average net income in the selected sample districts are very low compared to the yield in the neighbouring states like Andhra Pradesh and Tamil Nadu, where they have already undertaken intensive fish farming in several water spread areas of their states. It clearly focuses attention as to how this state can also rise to the level of other states in the production and profitable harvesting of the inland fishery resources. A well knit marketing system is also a very influential factor in achieving a higher production.

6.6.0 MARKETING OF INLAND FISH

A successful operation of the marketing system is a sine-qua-non of fishery development. Though in the changing scenario of fishery sector with intensive technique and higher yield, production over a period has increased, the market system of the inland fishery is yet to develop. Since the supply of fresh water fish is generally in small quantities, and is scattered, it is the retail market which has more significance than the wholesale market.
Unlike marine fish market the mode of sale in the inland sector is so difficult that they are unable to command a higher price due to inadequate marketing infrastructure. In the selected sample district of Chickamagalur nearly 100 percent of the fish harvested are taken directly to consumers (Table 6.18).

**TABLE - 6.18**

DISTRIBUTION OF FISH FARMERS BY MODE OF SALE OF FISH (In percentages)

<table>
<thead>
<tr>
<th>Districts</th>
<th>Direct to consumers</th>
<th>Mode of sales to Retailers</th>
<th>Agents</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shimoga</td>
<td>97.6</td>
<td>3.3</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>Chickamagalur</td>
<td>100.0</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td><strong>Average sale percentage</strong></td>
<td><strong>98.8</strong></td>
<td><strong>1.65</strong></td>
<td>-</td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Computed from field study 1990-91.

The fish farmers in the study districts had to face the problem of marketing. The harvested fish had sometimes sold at unreasonable price and had to make a distress sale. As the fish is most perishable, the catch is to be disposed before evening and as evening approached, the price is also reduced. Thus the price of a kg of fish varied between Rs. 20 and Rs. 10 and even less sometimes. Inadequate marketing system in the inland fishery is a major constraint for its development in the districts. The role of co-operatives and marketing federations are almost nil in this sector unlike marine fishery sector.
The fish farmers had to face several problems at the pond level such as poaching, predatory, weed fishes and weeds which in turn had adversely affected the production and marketing of the inland fish. In both the selected sample districts the above problems were faced by all the fish farmers and it was cent percent.

For instance poaching was a major problem faced by fish farmers and they were hesitant to invest. Predatory fishes and similar creatures, weed fishes and weeds are equally harmful to raise cultured fish in the farms. As a result of this, mortality rate of fish ranged from 50 to 70 percent. This pond level problems had emerged as a big hindrance in utilising the full potential of ponds in the State.
CHAPTER - VII

IDENTIFIED
IN FISHERY SECTOR OF KARNATAKA
The Major constraints of the developments of fishery sector in Karnataka are broadly classified into:

a] common constraints of both marine and inland fishery and specific constraints of each sub-system and

b] marketing constraints.

There are many inadequacies and problems related to the development of fishery in Karnataka. The identified constraints are helpful to plug the loopholes in the development of this sector to have a perspective planning for a sustained development.

7.1.0 Inadequate Data

Data pertaining to marine as well as inland fisheries are inadequate. More specific information on resource availability for particular fishing grounds are inadequate in the marine sector in spite of the remote sensing data developed in the recent times. The surveys conducted in respect of this have so far not been established any commercial viability of the deep sea fishing. CMFRI and FSI are planning to do more specific estimates of the major deep sea fisheries resources. This could successfully be materialized with the co-operation of the research and survey institutions and industry.
Data deficiency is prevalent in respect of brackish and inland fisheries. In case of reservoir fisheries it is mainly because the official agency's failure to collect necessary data on time series basis. This is a major constraint in planning and monitoring the reservoir fisheries development project. The urge for strong data base of the riverine fishery of the state is also projected because of fast depletion of several species, changes in production due to natural causes like flood, drought etc. and man made causes like water pollution and constructions of barrages that obstruct the regeneration of many species of fishes.

7.1.2 Financial Constraints

Marine sector faces financial inadequacy in respect of securing deep sea vessels, post harvest technology such as processing, marketing of the fishery products both in domestic and foreign markets. As adequate finance is required for all stages of production and marketing any shortage of finance hinders the progress of production and marketing. In the inland fishery there are several financial constraints for the development of fishery. They are in different forms such as inadequate credit provisions to such fish farmers through lead banks. Farmers are not in a position to procure loans from the banks on the basis of short lease periods. Loans on renovation of ponds are given in
instalments which delay the execution of work. Adequate finance is required for farm equipments, water charges, feed, fertilizer, seed, and several other efforts in production. This should be made available timely to enable farmers to increase the production and develop the market.

7.1.3 Licensing and Leasing constraints

The delay in issuing licenses in marine sector causes more hardship among the fishermen. The cumbersome official procedures and undue delay of four to six months for getting the licenses to the acquisition of deep sea vessels remain as a stumbling block and cause severe difficulties for the smooth functioning of this sector. Such delay, therefore, affects both production and marketing of fish.

The leasing policy of the government does not suit the development of brackish water fisheries. According to policy guidelines, about 40 percent of the area may be leased out to private entrepreneurs including companies. But there is considerable lack of clarity here and at the operational stage there are undue delay in processing applications for licenses. If such delay and slow implementation of leasing policy is followed even in future, it would be a major set back in the development of brackish water fishery.

Absence of a proper leasing policy is a major constraint in raising good crop from ponds and tanks. There
may be overlapping of leasing in case of several ponds and tanks. Both Zilla Parishat and local government simultaneously have the claim of leasing the same ponds or tanks in several places of the state. Another big constraint in the period of leasing which is usually very short, i.e., one or two years. But it must be sufficiently long say, 10 years, so that fishermen can motivate for a long term benefit.

Different leasing systems exists in reservoir fishery. Thus lack of uniform leasing policy leads to lack of motivation, meaningless data base, etc which hinder the proper progress in production.

In riverine fishery too lack of uniform leasing policy leads to indiscriminate exploitation of resources. In case of seasonal rivers, there may be complete removal of fish from the deeper pools where the fish take shelter during summer. Thus the leasing of fishery rights have to be re-examined and remedial measures are to be arrived at.

7.1.4 Inadequate Infrastructure facilities

In the marine sector, both coastal areas of Dakshina Kannada and Uttara Kannada are poorly equipped with landing, berthing and other service facilities. The domestic infrastructural facilities for processing low value species into fish products also lack adequate attention
in the state. The transport bottleneck in case of edible fish products from processors to consumer market too faces severe problems. The road as well railway transport for monitoring the movement of fish must be in the insulated and refrigerated vans and containers. Such facilities are extremely inadequate. The Air lift for fish also needs proper attention. Non-availability of adequate refrigerator cargo space for Indian goods creates problem for exports in terms of the delivery time which is 70 to 80 days as against 10 to 30 days for the competitors. The infrastructure facilities existed in the state remain quite inadequate both in terms of production and marketing.

The inland fishery sector in the state is also in the infant stage in respect of the infrastructure facilities existed. Many improvements have to be achieved in providing adequate infrastructure facilities such as roads, ice-storages, fast insulated and refrigerated vans etc.

7.2.0 SPECIFIC CONSTRAINTS OF MARINE FISHERY

7.2.1 Deficiency of modern vessels

The tapping of deep sea resources requires long liners, purse seiners and similar modern deep sea vessels and gears. Karnataka, a maritime state has little know-how on the designs of various types of vessels for the deep sea/
high sea resources. Besides, the gestation period for the production of vessels also takes 6 times more than the foreign yard. The deplorable production conditions and the undue delay in delivery of vessels indigenously add further constraints. Adequate deep sea vessels for the wild harvest is lacking and as such the potential resources remain unexploited in the EEZ.

7.2.2 Promotion constraints

The development of the export of processed fish products are yet to gather momentum in the state due to many reasons. The export of frozen fish is the raw material for reprocessing factories in developed countries. Though feasibility of IQF products are know to Indian exporters, several problems like high capital outlay, inadequate finance, bureaucratic delays and lack of international quality packing material are the major obstacles of IQF exports. Marine Products Export Development Agency (MPEDA) should take major initiative in this regard to promote the exports of the state food products.

7.2.3 Constraints in Joint ventures

The government's policy in respect of joint ventures was not very free and liberal, though some attempts were made earlier. The scope of joint venture deep sea fishing in the state is promising as the lion's share of the
sea resources of EEZ is yet to be tapped. Foreign capital, technology, marketing experience and man-power are required to realise the fruits of joint ventures. But there is a lot of problem for the state to equip with these necessary requirements. The latest policy of the government, such as liberalisation and globalisation in attracting foreign investors and multinational corporations for the deep sea fishing paves the way for more exploitation and wider market for the fishing products.

7.2.4 High incidence of tax

It is one of the biggest constraints in the marketing of fish products. Sale tax vary from place to place. This high incidence of tax not only rises the price of the products beyond the acceptable level, but also prevents the companies from broadening the consumer base.

7.2.5 Official delay and low catch

Many government permissions are required for deep sea fishing like tuna vessels operations and registration of these vessels with various authorities under the Merchant Shipping Act, MPEDA Act and several other official formalities take considerable time and undue delay. Besides, the financial viability of deep sea fishing is yet to be fully satisfied as there is a wide gap between the estimated production and the actual catch. In reality the actual catch
ranged between 10 to 25 percent of the projected figure. This raises questions of the reliability of the resources data of the deep sea fishing grounds.

7.2.6 Problems relating to spare parts, accessories and crews

Duty free or low duty processing machinery and equipment required for this sector may be made available. To find an Indian crew for deep sea fishing is difficult and as such it is necessary to get permission for hiring foreign crew. But again it is not easy and fast to get a clearance from both the ministry of Agriculture and Home Affairs. These kinds of practical constraints are obviously a big hindrance in the development of marine fishery, especially deep sea fishing.

7.3.0 COMMON CONSTRAINTS OF INLAND FISHERY SECTOR

Inland fishery sector here refers brackish water fishery, fresh water fishery such as tanks and ponds, reservoirs and riverine. The constraints identified are as follows.

7.3.1 Inadequate Supply of Seed

The brackish water fishery development in Karnataka state is lagging behind when compared to neighbouring maritime states of Tamilnadu, Kerala and Andhra Pradesh where hatcheries are already established. To cater to the needs of
future requirements a chain of hatcheries must be established in the state, especially in the coastal districts. In the light of uncertain and irregular wild catch, culture fisheries are gaining significance in the recent times. Therefore adequate supply of seeds of special varieties of prawn such as tiger prawn, white prawn and other important varieties of seeds are to be supplied in large quantities to meet both domestic and foreign demand. The area surveyed for suitable prawn culture is 8,000 hectares in the State and only 1800 hectares is currently under cultivation. Supply of adequate seed is inevitably needed for both extension and intensive prawn culture in the state. MPEDA has already extended financial assistance of Rs. 0.50 million to Karnataka state for establishing prawn hatcheries with technical assistance of CMFRI. One hatchery is being established in private sector in the State. But all these are quite inadequate compared to other maritime states abroad.

In ponds and tanks, the success of fishery development depends on the adequate supply of quality seeds. The seed production and availability at present are much below the requirements of culture. It will be still very low when more potential area are being used for fish culture in ponds and tanks. Hence there is an urgent need to introduce the latest technologies in commercial seed
production and more fish seed farms and hatcheries are to be set up. The present seed production by both government and private agencies must also be increased and more provisions must be made to raise the quality of production. The same constraints of inadequate seed exists even in the development of reservoir fishery in the state.

7.3.2 Inadequate quality feed

For both intensive and semi-intensive brackish water fish farming good quality feed is an inevitable input. At present there is a great constraint in getting good quality feed for aquaculture within the state, unless it is imported which definitely adds up further crises in foreign exchanges. The ministry of Agriculture, with UNDP assistance are stepping forward to establish pilot feed plants. MPEDA and several private companies are also coming forward in this direction and as such there in an urgent need to set up necessary infrastructure and input for the same. The feed requirement for prawn culture per hectare would be about 6 tonnes. Unless commercial feed mills are not established soon, it will not only be a hindrance for the present development of brackish water fishery but also to tap the future potential. In Karwar district of Karnataka 1252.44 hectares are covered under prawn farming. The feed at present supplied is only 9.555 tonnes as against the requirement of about 7514.64 tonnes.
In ponds and tanks fisheries too acceptable quality feed prepared out of local ingredients are to be provided to the farmers. Such facilities are yet to be developed in the state to meet the increasing requirements. Pellet type feed which neither dissolve in water nor pollute, has been in use extensively in many countries. The same way also be used widely in the state.

7.3.3 Inadequate Extension service and Trained man-power

Brackish water fishery in the state encounters the above problem. In case of small and marginal farmers necessary training and extension service is quite essential, whereas companies, corporations and entrepreneurs who venture in this field mobilize their own resources, technology and management services. The non-availability of adequate technical manpower remains to be a major constraint in this field to carry out extension service for the promotion of production and sales.

In ponds and tanks fishery extension worker and officer is assigned with larger areas of work leading to increasing work load of extension personnel and fish farmers are dropped out due to lack of contact. The proper functioning of FFDA is also hindered due to the assignment of extension workers to other duties under deputation. Thus under-staffing of extension services is a severe obstacle for the development of tank and pond fishery.

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7.3.4 Inadequate Regulatory Measures

Reservoir fishery is mainly a stocking-cum-capture system. Most of the reservoirs do not follow any systematic stocking policy. Hence an appropriate regulatory system is absolutely necessary for the development of reservoir fishery.

It has been noted that there are over exploitation of certain stretches of rivers due to non-enforcement of regulatory measures. But these regulations also have played some subordinate role due to enforcement problems and difficulties in subsequent monitoring of the activities of the user group. Hence proper analysis and examination are needed in this regard.

7.4.0 SPECIFIC CONSTRAINTS OF BRACKISH WATER FISHERY DEVELOPMENT

7.4.1 Selection and preparation of suitable sites

The foremost work in respect of brackish water fishery culture is to ascertain suitable sites for fish culture. It is not an easy task as it requires both detailed micro and macro level surveys of the areas, their potential productivity, economic viability and other suitable factors for culture. Such kinds of identifications are not being made immediately due to high cost of these surveys. Both central as well as state agencies must come forward to carry out these tasks. There is no much headway
in this regard and hardly be there any sufficient progress in the near future too. Thus lack of proper identification of suitable sites at the required pace every year is a major constraint in expanding brackish water culture to the optimum level.

7.4.2 Constraints on Technology and Engineering Inputs

Appropriate technology and its effective application is most needed to step up production of fish in brackish water. Countries like Mexico, Taiwan etc have developed modern technology to bring about higher production. Taiwan with its semi-intensive method is able to raise 20 tones of Shrimps hectare per year, which they are going to raise 40 tonnes/ha/year with intensive method of prawn farming, whereas it is extremely low in India, particularly in Karnataka state. Thus failure to adopt proper technology will result in low yield and hence lead to under utilisation of actual production potential of identified areas.

Inadequate engineering input is a yet another constraint. The state government has inadequate techniques in surveying large areas, farm design and construction. Unless the state govt. takes initiative in building up adequate engineering designing and planning needed for the brackish water aquaculture, the development in this sector will definitely be prolonged. If the state fisheries department takes interest in this regard with its own engineers and
biologists to cover as many area as possible, faster development can be achieved.

7.4.3 Inadequate support systems

The support systems like finance, insurance, infrastructure, marketing and information are supposed to be the most stimulant factors responsible for the development of this sector. But these factors are not properly geared for a faster change in the sector. For example, the initial capital investment in this i.e. pond construction alone needs Rs. 50,000 to 1,00,000 per hectare, depending on the terrain and soil conditions. In addition a sum of Rs. 75,000 towards capital cost and Rs. 17,000 and Rs. 10,500 towards operation cost towards I and II year crops have to be set apart for extensive shrimp farming. Though banks have come forward with financial assistance under the NABARD refinancing, there are several difficulties in getting loans. Subsidies are provided by BFDA and MPEDA and even then prawn farming has not come up as expected.

There is no proper insurance coverage against risk like flood, cyclone, drought, disease and poaching which affect the production adversely. As the insurance premium is high and that too the cover is only for total loss of crop, many farmers are prepared to take the risk rather than paying the heavy premium. Hence a fresh look in liberalising the terms of insurance must be made to plug the loop holes.
Infrastructure facilities like all weather roads, transport, electricity, drinking water supply, living facilities and several other requirements are not adequate to meet the needs of the farmers. So government has to come forward to provide such facilities.

The marketing bottleneck is experienced due to lack of storage facilities by the farmers and also due to the differences in the price at the pond site and in the open market. Hence these constraints must be properly eliminated.

7.5.0 SPECIFIC CONSTRAINTS OF PONDS AND TANKS FISHERY DEVELOPMENT

7.5.1 Technology constraint

Inadequate technology in the ponds and tanks fishery reduces the production at a higher level. Even to reach the level of 2 tonnes per hectare per year is difficult. There is an urgent need to upgrade the production technology and also to transfer the technologies to match a higher level of production.

7.6.0 SPECIFIC CONSTRAINTS IN THE DEVELOPMENT OF RESERVOIR FISHERIES (Stocking-cum-capture fisheries)

7.6.1 Royalty

As many of the reservoirs are owned by the irrigation department the fishery department has to pay a fee or Royalty to obtain fishing rights. But in turn irrigation
department or hydel electric department does not perform any service to fisheries development. Thus it has to be re-examined to abolish the royalty or to persuade the departments to do some important services for fisheries development.

7.6.2 Lack of initial involvement of fisheries department

This has created problem in harvesting fish, from the reservoirs. Because at the time of starting the construction of reservoirs there is no coordination with fisheries department in removing trees, tree trunks, rocks etc from reservoir beds. In the initial stages of reservoirs, proper provision for fisheries development must also be made by preparing good ground for fish production and harvesting.

7.6.3 Lack of proper conservation

Proper conservation of fisheries is not getting more attention. Strict vigilance to restrict harvest during breeding seasons and checking the industrial and other pollution to the reservoir are to be followed. As a result of this fish in many small reservoirs are completely destroyed.

7.7.0 SPECIFIC CONSTRAINTS OF RIVERINE FISHERY
(Capture fishery)

7.7.1 Destruction of Breeding grounds

Industrial effluents have destructed many valuable
breeding grounds in the river systems of the state. Human concentration and fast development of cities and towns along the river banks caused severe damage to the life in the river system.

7.7.2 Physical destruction to migration of fishes

Many migrating fishes like 'hilsa' are reduced as low as 5 percent compared to a decade ago. It is due to the fact that construction of dams, barrages and bridges across the rivers creates physical destruction to the migration of fishes.

7.8.0 MARKETING CONSTRAINTS.

A deep insight into the fish marketing and processing and their major constraints are important guidelines to prepare genuine and adequate grounds for the fishery development. Increased production of fish unaccompanied by effective demand would definitely create a major constraint in the market. There are several market bottlenecks identified in this sector.

7.8.1 Unfamiliar species and varieties of fish

Some varieties of the catch are not used by the consumers, and as such they are discarded as by-catching at the sea. The delivery for only some important varieties remain always high, where as some other varieties, though
they have high food values are not demanded by the consumers due to their shape, appearance etc. Apart from these there may be cultural barriers that also prevent the consumers from the use of different varieties of marine fish.

To overcome such constraints there must be improvements in processing, introduction of new uses for fish and non-traditional foods from fish. This is to be carried out initially by government and then subsequently by private enterprise.

7.8.2 Low inland market for marine fish

There are several constraints to capture the inland market for marine fish. In general the absence of an adequate fish marketing infrastructure in the inland has resulted in the high concentration of market in the coastal regions. It is also necessary to examine the potential consumer demand in these regions depending upon the consumer preference for different varieties such as dried, smoked or salted fish.

7.8.3 Inefficient domestic marketing and distribution system

If the distribution chain shows signs of monopolistic controls it will affect both fishermen and consumers adversely. Fishermen are paid very low and consumers are charged high price. As a result less is
produced and demanded than under competitive conditions. This is to be changed by improving and reforming the existing market channels.

7.8.4 Constraints of marine fish exports

This also has a serious constraining effect on production. Both tariff and non tariff barriers and reluctance to accept new sources of supply are some of the difficulties in expanding foreign market. The reasons for this may partly be the inability of potential exporters to produce a product with a sufficiently high and constant standard of quality. Lack of communication on market intelligence between potential exporters and importers is yet another constraint though this is being remedied by the work of regional marketing advisory services were initiated by FAO.

In addition to these constraints there are several other constraints from administrators, policy makers etc. The constraints of fish marketing operation systems are observed from producers, traders, administrators and policy makers. From the producers side the problem area may broadly be divided into 1) Market outlet, 2) Market position and 3) specific risk. In the market out let the problem points are lack of buyers, transport, cash and credit, storage facilities, preservation facilities etc. In case of market position the problem points are dependence on traders, lack
of information, low product prices, high costs of offering supplies, and limited marketing management capacity. Specific risk in respect of price or supply fluctuations has high physical losses and income instability.

From the traders side, the problem area may also be divided into three 1) supplies 2) Market position & 3) specific risks. The problems relating to supplies are unstable or dispersed offers, small lots, and deficient transport system. In regard to market position the main problem points are intensive competition, lack of information, political discrimination, high costs and inappropriate market regulations. The specific risk from the traders side arises out of price fluctuations, high losses, unstable supplies and credit given to purchasers.

Major constraints from administrators are broadly worked out as 1) working conditions 2) Economy and 3) Specific problems. The bottle necks of working conditions are from rigid and ineffective regulations, administrative incapacities, isolation from fishermen and traders, information inflow problems, and slow operation of bureaucracy. Constraints with domestic marketing system from the economy side are cost of administration, fees and inefficiency of public enterprises. The specific problems related to administration are fluctuations of personnel, political influence and corruption.
The problem area from policy makers are mainly two viz. 1) Supply of fish population and 2) Specific problems. The problem regarding the supply of population may be the inadequacy of transport or storage system, processing, losses, price levels and productivity. Policy makers specific problems are monitoring integration of functions information and promotion and effectiveness of measures.

In brief, the constraints of (Karnataka state) fishery may be both pre-harvest and post-harvest constraints. There are technical and institutional constraints. A systematic approach to uproot these constraints has been attempted in the proceeding chapter.