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**in Coastal Ecosystem of Andhra Pradesh,
Karnataka, Kerala and Tamilnadu**

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AND TAMILNADU
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Chapter 2

BENCH MARK SURVEY OF SELECTED VILLAGES

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ABSTRACT

The research project "Studies on fisherwomen in the Coastal Ecosystems of Andhra Pradesh, Karnataka, Kerala and Tamilnadu" was carried out with an aim to study the socio-economic, nutritional and health status of the fisherwomen besides imparting them training in alternate income generating activities to improve their standard of living. To facilitate the conduct of this project a benchmark survey was conducted and the basic information on different aspects of the fisherwomen and general features such as physical and geographical, demographical and other related information were collected. The information thus collected reveal that the Andhra Pradesh lies on the east coast, Karnataka and Kerala lies on the west coast while Tamilnadu covers both east and west coast. Total coastal length of the study area is 2940 km and the landing centers were 1243. Out of 34 coastal Districts in these four states, present study was conducted in 13 districts covering 27 villages and 5744 households. The total fisher population of the study area is 33,65,452, with an active fisher folk population of 8,45,354. There are a total 661 ice plants, 118 freezing plants, 214 processing plants, 594 peeling sheds and 106 other units mainly cold storage and net making units. There are 28,169 mechanized crafts, 35,938 motorized units and 1,23,877 traditional crafts in operation in the entire study area. As much as 9,98,596 ha of potential area are available for aquaculture and a total production of 4,76,945 tones is recorded. The average family size is 4.5 and the most dominant age group is youth, aged between 7 and 25 years. Literacy rate is 65.6% and 54.7% of women in the study area are involved in fishery related activities. Most of the fishing families belongs to back ward community practicing Hinduism. Majority of them live in own house and the type prevalent is tiled house. Most of them are land less and consequently do not participate in aquaculture activities. Nearly 60.5% of fisherwomen earn between Rs.1000 and 2000 per month indicating a very low income earning and are poor. Many of them are not members in women self help groups.

INTRODUCTION

The basic fundamental requirement is the detailed information on the resource potentials, infrastructure availability and prevailing status of developmental activities under progress in the ecosystem for harnessing an eco-friendly sustainable development in any ecosystem under consideration. This can be obtained through a proper bench mark survey of the ecosystem. The "Bench Mark Survey" refers to the survey of the area where we want to conduct a research project or implement a scheme before the commencement of the work to collect some basic information against which the impact of the project can be evaluated.

A Research Project entitled, "Studies on fisherwomen in the Coastal Ecosystems of Andhra Pradesh, Karnataka, Kerala and Tamilnadu" was proposed by the A.N.G.Ranga Agricultural University in collaboration with Central Marine Fisheries Research Institute and University of Agricultural Sciences, Mangalore under the National Agricultural Technology Project (NATP) funded by World Bank. The project aimed to study the socio-economic, nutritional and health status of the fisherwomen besides imparting them training in alternate income generating activities to improve their standard of living. With this theme in focus, in these four states 27 coastal villages spread across 13 districts were selected for the study. To facilitate the conduct of this project a benchmark survey was conducted in these villages to collect the basic information about different aspects of the fisherwomen and general features of the selected regions (Physical and Geographical, Demographical and related information). The information

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thus collected are presented in this paper in two parts-Part I dealing with the macro level data pertaining to fishery and fishery related aspects and Part II summarizing the salient features of the selected villages which supported the selection of these villages for this study.

Methodology

The required information was collected from two sources namely primary and secondary. The secondary sources included the publications of the State Government Departments of the respective states, statistical yearbooks published by the Directorate of Economics and Statistics of the concerned State Governments, the Annual Reports of the respective State Fisheries Departments and other published information from the gazettes and journals. The information was collected with the help of a planned schedule and compiled in Part I. The primary data was collected with the help of the questionnaire prepared after during the discussion in the first meeting of the Research Project Team. A Preliminary Survey was conducted in about 1000 households in each State covering different groups of fisherwomen. It was proposed to give coverage for all the three groups of fishery sector namely, mechanized, motorized and non-mechanised sectors. The salient features of the preliminary survey are presented in Part II.

Statistical analysis

The data generated has been utilized to meet the objectives of the study. Frequency distributions, Mean and Standard Deviations and tests of significance were utilized and the results are provided for each of the variables studied. Analysis variance, Chisquare test and multiple comparison 't' test procedures were utilized and the results are been provided in the chapters (Visveswara Rao, 1996)

Results and Discussion

The analysis of the information collected from the primary and secondary sources have been done in two parts as mentioned below.

PART I

General Details of the Study Area -Macro Level Information

3.1 Geographical Location

The survey was carried out in four maritime states of India Andhra Pradesh, Karnataka, Kerala and Tamilnadu and the general details of the study area such as the geographic locations, boundaries of these states and other details are given here under. The details of the geographical location of the States are presented in Table 1. The geographic locations of the four maritime states are summarized in the following table. This shows that these states are located in a tropical belt with prolonged sunshine and bestowed with two monsoons.

Table 1 Geographical Location of the Selected States

| Details | Andhra Pradesh | Karnataka | Kerala | Tamilnadu |
|-----------|------------------------|------------------------|------------------------|------------------------|
| Latitude | 12° 14' – 19° 54' N | 12° 50' – 14° 48' N | 8° 18' – 12° 48' N | 8° 5' – 13° 35' N |
| Longitude | 76° 50' – 84° 50' E | 74° 5' – 74° 8' E | 74° 52' – 77° 22' E | 76° 15' – 80° 20' E |

3.2 Boundaries of the States

The data regarding the boundaries of the study area are presented in

Table 2: Boundaries of the study areas

| Directions | Andhra pradesh | Karnataka | Kerala | Tamilnadu |
|------------|------------------------|------------------------------|-----------------------|--|
| North | Chattisgarh & Orissa | Maharashtra & Andhra pradesh | Karnataka | Andhra pradesh & Karnataka |
| South | Tamilnadu & Karnataka | Kerala & Tamilnadu | Tamilnadu | Gulf of Mannar & Indian Ocean |
| East | Bay of Bengal | Andhrapradesh & Tamilnadu | Tamilnadu & Karnataka | Bay of Bengal, Palk Bay & Gulf of Mannar |
| West | Karnataka & Mahārahtra | Arabian Sea | Arabian Sea | Kerala & Arabian sea |

It can be summarized from Table 2 that, the whole study area is surrounded by sea on three sides ie, south by Indian ocean, west by Arabian sea and east by Bay of Bengal, and north is covered by Chattisgarh, Orissa and Maharastra. Among the States, Andhra Pradesh lies in the east coast, Tamilnadu covers both east and west coast, Kerala and Karnataka lies in the west coast.

3.3 Fishery resources of the Selected States

The fishery resources of the States include the length of the coastal line, coastal districts, fishermen population (total and active), crafts and gears operated, fishery resources like the species of fish that are harvested, fishery infrastructure and the area under aquaculture (brackish and fresh water). These information have been discussed below.

3.3.1 Details of Coastal length and Coastal districts

The details of the coastal length and the number of coastal districts in the selected States are presented in table 3.

Table 3: Coastal length, number of landing centers, total Districts and coastal Districts in the selected States.

| Particulars | Andhra | Karnataka | Kerala | Tamilnadu | Total |
|------------------------|--------|-----------|--------|-----------|-------|
| Coastal Length (Kms) | 974 | 300 | 590 | 1076 | 2940 |
| Landing centres (No) | 508 | 34 | 333 | 368 | 1243 |
| Total Districts (No) | 23 | 27 | 14 | 29 | 93 |
| Coastal Districts (No) | 9 | 3 | 9 | 13 | 34 |
| % of Coastal districts | 39.1 | 11.1 | 64.3 | 44.8 | 36.5 |

Note: Percentage of coastal districts are different between states ($P < 0.01$, $\chi^2 = 13.20$)

It is seen from the table, that the study covered a total coastal length of 2940 km, which encompassed 1243 landing centres and 34 coastal districts. Among the different States, Tamilnadu has the maximum coastal length covering east and west coasts (60 km in the west). It was also observed that

out of the four states covered under the present study Kerala has more percentage of coastal districts ie, 64.3, followed by Tamilnadu (44.8%), Andhra (39.1%) and Karnataka (11.1%).

3.3.2 Demography

The data regarding the fishermen population both total and active are presented in table 4.

Table 4: Fishermen population in the selected States

| Details | Andhra Pradesh | Karnataka | Kerala | Tamilnadu | Total |
|-----------------------|----------------|-----------|---------|-----------|---------|
| Total Fishermen pop. | 871709 | 764032 | 1050000 | 679711 | 3365452 |
| Active Fishermen pop. | 204417 | 204347 | 164148 | 272442 | 845354 |
| Active Fishermen (%) | 23.4 | 26.7 | 15.6 | 40.1 | 25.1 |

Note: Variations in active fishermen (%) are significant between states ($P < 0.01$)

It is seen from the table, that the total fishermen population of the selected States is 33,65,452, out of which, the active fishermen population is only 8,45,354 ie, 25.1 per cent. Among the selected States, Tamilnadu has the highest active fishermen population (40.1%) followed by Karnataka (26.7%), Andhra (23.4%) and Kerala (15.6%). The differences are found significant ($P < 0.01$)

3.3.3 Fishing Crafts and Gears

The different types of fishing crafts and gears employed in the study States are presented in table 5.

Table 5: Fishing Crafts operated in the Selected States

| Details | Andhra Pradesh | Karnataka | Kerala | Tamilnadu | Total |
|-------------------|----------------------|--------------------------|--------------------------|----------------------|---------------------------|
| Mechanized | 8642 (13.8) | 6318 (24.7) | 5200 (10.3) | 8009 (16.1) | 28169 (15.0) |
| Non Mechanized | 50021 (80.1) | 19292 (75.3) | 28000 (55.8) | 26564 (53.5) | 123877 (65.9) |
| Motorised | 3832 (6.1) | 0 (0.0) | 17000 (33.9) | 15106 (30.4) | 35938 (19.1) |
| Total | 62495 (100.0) | 25610 (100.0) | 50200 (100.0) | 49679 (100.0) | 187984 (100.0) |
| Percentage | 33.3 | 13.6 | 26.7 | 26.4 | 100.0 |

Note 1: Figures in parenthesis are percentages

2: Variations between states are significant ($\chi^2 = 26036.9$, degrees of freedom, 6, $p < 0.001$)

It is seen from the above table that in Kerala, Tamilnadu and Andhra Pradesh, higher number of mechanized and motorized crafts are being operated compared to Karnataka State. This may be because of the spread of the coastal length, which is higher in these states. In the study area there are a total of 1,87,984 fishing units of different category in which 28,169 (15.0%) are mechanized crafts, 35,938 (19.1 %) are motorized country crafts and 1,23,877 (65.9%) are traditional crafts in operation for fishing.

3.3.4 Fishery resources of the Selected States

The important fishery resources of the Selected States are presented below in table 6.

Table 6: Important Fishery resources of the selected states

| Andhrapradesh | Karnataka | Kerala | Tamilnadu |
|--------------------|----------------|----------------|----------------|
| Sardines | Sardines | Sardines | Sardines |
| Penaeid prawns | Mackeral | Mackeral | Penaeid prawns |
| Non-penaeid prawns | Seerfish | Seerfish | Silverbellies |
| Ribbon fish | Ribbon fish | Ribbon fish | Anchovies |
| Cat fishes | Sciaenids | Sciaenids | Ribbon fish |
| Pomfrets | Carangids | Elasmobranches | Elasmobranchs |
| Mackerals | Catfish | Pomfrets | Pomfrets |
| Sharks | Panaeid prawns | Panaeid prawns | Mackerals |
| Carangids | Pomfrets | Anchovies | Perches |
| Sciaenids | | Carangids | Other clupeids |

The fishery resource potentials differ from coast to coast and from state to state. The fishery resources of the east coast are different from the west coast. However, the dominant resource appears to be the sardines, which includes the oil sardine and the lesser sardines followed by the Indian mackerel. The penaeid prawns occur in all the states with variation in the quantity. Whereas the non-penaeid prawns are dominant only in Andhra Pradesh. The perches are characteristics to Tamilnadu coast and the elasmobranches occur more on the south east and south west coasts. Silver bellies are dominant along the Tamilnadu coast.

3.3.5 Fishery infrastructure

The fishery infrastructure is important from the post harvest point of view in the fishery sector. A well-developed fishery infrastructures indicate a well established processing industry in the State. The details of the fishery infrastructures in the selected States are presented in table 7.

Table 7: Fishery Infrastructure of the selected States

| Details | Andhra Pradesh (%) | Karnataka(%) | Kerala (%) | Tamilnadu (%) | Total (%) |
|-------------------|--------------------|--------------------|--------------------|-------------------|---------------------|
| Ice plants | 355 (68.1) | 151 (53.5) | 140 (16.3) | 15 (50.0) | 661 (39.0) |
| Net making units | 0 (0.0) | 3 (1.1) | 4 (0.5) | | 7 (0.4) |
| Freezing plants | 38 (7.3) | 22 (7.8) | 53 (6.2) | 5 (16.7) | 118 (7.0) |
| Processing plants | 36 (6.9) | 25 (8.9) | 143 (16.6) | 10 (33.3) | 214 (12.6) |
| Peeling sheds | 48 (9.2) | 26 (9.2) | 520 (60.4) | | 594 (35.1) |
| Others | 44 (8.5) | 55 (19.5) | 0 (0.0) | 0 (0.0) | 99 (5.9) |
| Total | 521 (100.0) | 282 (100.0) | 860 (100.0) | 30 (100.0) | 1693 (100.0) |

Note: Figures in parenthesis are percentages

The details on the fishery infrastructure facilities available in these states indicate that out of the total 1693 units, there are 661 Ice plants, 7 net making units, 118 freezing plants, 214 processing plants, 594 peeling sheds and 99 other fishery infrastructure units mainly cold storage in these four states. Statewise details indicate that more number of units are available in Kerala followed by Andhra Pradesh, Karnataka and Tamilnadu. The poor number of fishery infrastructure facilities available in Tamilnadu when compared to its marine fish production may be owing to the best transport facilities available.

3.4 Aquaculture potential of the Selected States

With the capture fishery reaching a peak and remaining stagnated, a viable alternative was seen in aquaculture. The attention is now being given for utilizing the area under aquaculture and bringing more area under culture of different species to meet the export demand as well as the domestic demand. The

details of the potential area under aquaculture and the production in the selected States are presented in table 8.

Table 8: Potential area under aquaculture in the selected states

| Details | Andhra Pradesh | Karnataka | Kerala | Tamilnadu | Total |
|---------------------------|----------------|-----------|--------|-----------|--------|
| Area under culture (hect) | 62593 | 500000 | 65213 | 370790 | 998596 |
| Total production (tones) | 44856 | 264000 | 54000 | 114089 | 476945 |
| Rate of production/ha (t) | 0.72 | 0.53 | 0.83 | 0.31 | 0.48 |

Total area of 9,98,596 hectare is potentially available for aquaculture and a total production of 4,76,945 tones is recorded in the study area. Karnataka has the maximum potential area and recorded the maximum production among the four states of the study area. The rate of production roughly worked out for these four states indicates that Kerala ranks first followed by Andhra Pradesh, Karnataka and Tamilnadu. The over all production rate is only 0.48 t per ha which is very low and there is bright prospects for fish production through aquaculture in these states through appropriate eco-friendly methods.

PART II

Details of the Villages Selected for the Study

In this section, the details regarding the selection of the sample districts, villages and households are discussed. Besides the results of the preliminary survey conducted is also described.

4.1 Selection of districts and villages

The selection of districts for each State was decided during the first interaction meeting of the research project Team. It was decided to have four districts in A.P, two in Karnataka, three in Kerala and four in Tamilnadu

The districts were selected based on their relative importance with respect to fishing in the respective States. From the selected districts, the villages were selected, again based on their importance in fishing and giving representation to all the three sectors of fishery namely-Mechanised, Motorised and Non-mechanised. For example in North Tamilnadu, Pudmanaikuppam in Chennai is a predominantly a mechnised fishing village, Kovalam is a mortised fishing village and Pulicut is a non-mechanised fishing village. In South Tamilnadu, Thirespuram in Tuticorin is a mechanized fishing village, Punnakayal is motorized and Tharuvaikulam is a nonmechnaised fishing villages. The details of the number of districts and villages selected are presented in table 9.

Table 9: Details of the selected villages

| State | No. of dist. Covered | No. of villages covered | No. of households covered |
|---------------|----------------------|-------------------------|---------------------------|
| Andhrapradesh | 4 (30.8) | 9 (33.3) | 1800 (31.3) |
| Karnataka | 2 (15.4) | 8 (26.0) | 1008 (17.8) |
| Kerala | 3 (23.0) | 5 (18.5) | 1255 (21.8) |
| Tamilnadu | 4 (30.8) | 6 (22.2) | 1681 (29.3) |
| Total | 13 (100.0) | 28 (100.0) | 5744 (100.0) |

Note: Figures in parenthesis are percentages

The survey was conducted in 1800 households covering 9 villages of the 4 districts selected in Andhra Pradesh, 1008 households covering 7 villages in 2 districts in Karnataka, 1255 households in the 5 villages covering 3 districts in Kerala and 1681 households of 6 selected villages of the 4 districts in Tamilnadu.

4.2 Objectives for selection of villages

The villages for the study were selected based on the objectives and the different stakeholders in the coastal eco-system involving fisherwomen. Representations were given to mechanized, motorized

and non-mechanized fishing households; different post-harvest operations done by the fisherwomen and other activities.

4.3 General Information of the selected households

The general information of the selected households including family size, age group, literacy, occupation and income level are described below.

4.3.1 Family size

The details regarding the family size and composition of the selected households are given in table 10.

Table 10: State wise family size and sex composition of households studied

| Name of State | Men | Women | Children | Total | Average family size |
|----------------|------------------------|------------------------|------------------------|--------------------------|---------------------|
| Andhra Pradesh | 2015 (28.1) | 1912 (26.6) | 3255 (45.3) | 7182 (100.0) | 3.9 |
| Karnataka | 1830 (32.2) | 2110 (37.1) | 1741 (30.7) | 5681 (100.0) | 5.6 |
| Kerala | 1751 (32.3) | 1890 (34.8) | 1787 (32.9) | 5428 (100.0) | 4.3 |
| Tamilnadu | 3491 (44.0) | 3506 (44.2) | 935 (11.8) | 7932 (100.0) | 4.7 |
| Total | 9087 (34.7) | 9418 (35.9) | 7718 (29.4) | 26223 (100.0) | 4.5 |

Note 1: Figures in parenthesis are percentages

2: Sex composition of house holds are significant between states ($\chi^2 = 2118.34$, d.f. = 6, $p < 0.001$)

It is seen from the table that the lowest average family size of 3.9 was observed in Andhra Pradesh and the largest average family size of 5.6 was observed in Karnataka. And the average family size observed in the entire study area is 4.5. composition of the families studied is observed varying children are seen highest in Andhra and lowest in Tamilnadu, Kerala and Karnataka are seen with more or less same composition.

4.3.2 Age group of the fisherwomen

The details of the age group of the fisherwomen are presented in table 11

Table 11: Composition of women by age in years by states

| Name of State | Age in years | | | | | | Total |
|----------------|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------------------|
| | 0-6 | 7-15 | 16-25 | 26-35 | 36-45 | 45& above | |
| Andhra Pradesh | 260 (9.9) | 571 (21.3) | 485 (18.1) | 699 (26.1) | 365 (13.6) | 296 (11.1) | 2676 (100.0) |
| Karnataka | 247 (4.4) | 1034 (18.2) | 1030 (18.0) | 1605 (28.3) | 1165 (20.5) | 600 (10.6) | 5681 (100.0) |
| Kerala | 446 (7.9) | 1492 (26.3) | 1451 (25.6) | 880 (15.5) | 782 (13.8) | 615 (10.9) | 5666 (100.0) |
| Tamilnadu | 506 (12.6) | 926 (23.1) | 996 (24.8) | 768 (19.1) | 529 (13.2) | 290 (7.2) | 4015 (100.0) |
| Total | 1459 (8.0) | 4023 (22.3) | 3962 (22.0) | 3952 (21.9) | 2841 (15.8) | 1801 (10.0) | 18038 (100.0) |

Note1: Figures in parenthesis are percentages

2: Variations in age composition are significantly between states ($\chi^2 = 804.87$, d.f. = 15, $p < 0.001$)

It is observed that 8.1 % (1459) of the population are children below 6 years of age, 22.3 % (4023) are adolescent girls of age group 7-15 years, 22.0% (3962) are of the age group 16-25 years, 21.9% (3952) are of the age group 26-35 years, 15.7% (2841) are women of age group 36-45 years and the remaining 10.0% (1801) are women of age above 45 years.

The most dominant age group observed in the present study is adolescent girls of age between 7 and 15 years, followed by women of age 16 - 25 years indicating the presence of more youth among the population.

4.3.3 Literacy Status

The details of the literacy status of the respondents are given in table 12.

Table 12: Literacy status of respondents by states

| Name of State | Literates | Illiterates | Children | Literacy rate % |
|----------------|--------------|-------------|-------------|-----------------|
| Andhra Pradesh | 2653 | 4116 | 413 | 36.9 % |
| Karnataka | 4165 | 1516 | 247 | 70.3 % |
| Kerala | 4373 | 772 | 203 | 81.8 % |
| Tamilnadu | 6109 | 1216 | 607 | 77.0 % |
| Total | 17300 | 7620 | 1470 | 65.6 % |

Note: Variations in literacy status between states are significant ($\chi^2 = 4216.27$, d.f. = 3, $p < 0.001$)

It is observed in the study area that the overall literacy rate is 65.6%, while the lowest literacy rate is observed in Andhra Pradesh (36.9%) and the highest rate of literacy is observed in Kerala (81.8%).

4.3.4 Occupation

The fisherwomen involve themselves in some occupation with respect to post harvest fishery besides looking after the households. The relevant details are presented in table 13.

Table 13: Occupational status of fisherwomen by states

| Name of State | Fishing related | Housewives | Others | % women in fishing related activities |
|----------------|-----------------|------------|--------|---------------------------------------|
| Andhra Pradesh | 720 | 697 | 383 | 40.0 |
| Karnataka | 1008 | - | - | 100.0 |
| Kerala | 1971 | 448 | 157 | 76.5 |
| Tamilnadu | 169 | 1356 | 156 | 10.0 |
| Total | 3868 | 2501 | 696 | 54.8 |
| Percentage | 54.8 | 35.4 | 9.9 | |

Note: Occupational status is found significant between states ($\chi^2 = 1690.16$, d.f. = 4, $p < 0.001$)

In the present study, a total of 7065 fisherwomen were sampled, in which 54.8% are engaged in fishing related activities, 35.4% are housewives and the balance 9.9% are engaged in other activities which are not related to fishing. It is observed that all the fisherwomen in Karnataka have been observed to be involved in fishing related activities (100.0%). Whereas, in Tamilnadu only 10% of fisherwomen are engaged in fishing related activities and most of them are housewives. On an average 54.8% of fisherwomen are involved in fishing related activities.

4.3.5 Income

The information regarding the income earned by the fisherwomen households are presented in table 14.

Table 14: Income level (Rs/month) of the sample households of the selected states

| Name of the states | Range of income (Rs.) | | | | | | Total |
|--------------------|-----------------------|------------------------|------------------------|-----------------------|----------------------|----------------------|---------------------|
| | <1000 | 1000-1500 | 1500-2000 | 2000-3000 | 3000-5000 | >5000 | |
| Andhra Pradesh | 356 (23.5) | 567 (37.4) | 265 (17.5) | 214 (14.1) | 89 (5.9) | 24 (1.6) | 1515 (100.0) |
| Karnataka | 23 (2.3) | 219 (21.7) | 562 (55.8) | 198 (19.6) | 6 (0.6) | 0 (0.0) | 1008 (100.0) |
| Kerala | 91 (7.2) | 469 (37.4) | 563 (44.9) | 114 (9.1) | 18 (1.4) | 0 (0.0) | 1255 (100.0) |
| Tamilnadu | 404 (24.0) | 285 (17.0) | 374 (22.2) | 351 (20.9) | 181 (10.8) | 86 (5.1) | 1681 (100.0) |
| Total | 874 (16.0) | 1540 (28.2) | 1764 (32.3) | 877 (16.1) | 294 (5.4) | 110 (2.0) | 5459 (100.0) |

Note 1: Figures in parenthesis are percentages

2: Variations between states are significant ($\chi^2 = 1232.69, p < 0.001$)

It is seen from the table that the maximum number of households (32.3%) earns an annual income ranging between Rs.1500 and 2000, followed by Rs.1000-1500 group. This clearly indicates that the income generation by the fisherwomen is very low and most of them are poor. Andhra Pradesh and Tamilnadu are observed with higher number with lowest income of below Rs.1000 per month as well as with higher income of above Rs.3000 per month.

5. Religion, Caste, custom and community

The details regarding the religion, custom, caste and community are presented in this section in Tables 15 & 16.

Table 15: Caste structure of households studied by states

| Name of State | Castes | | | | Total |
|----------------|--------------------|--------------------|-------------------|-----------------|---------------------|
| | MBC | BC | SC/ST | Others | |
| Andhra Pradesh | 0 (0.0) | 1800 (100.0) | 0 (0.0) | 0 (0.0) | 1800 (100.0) |
| Karnataka | 0 (0.0) | 947 (93.9) | 45 (4.5) | 16 (1.6) | 1008 (100.0) |
| Kerala | 0 (0.0) | 804 (64.1) | 451 (35.9) | 0 (0.0) | 1255 (100.0) |
| Tamilnadu | 1316 (78.3) | 282 (16.8) | 83 (4.9) | 0 (0.0) | 1681 (100.0) |
| Total | 1316 (23.0) | 3833 (66.7) | 579 (10.0) | 16 (0.3) | 5744 (100.0) |

Note 1: Figures in parenthesis are percentages

2: Variations between states are significant ($p < 0.001$)

It is observed that the majority of the fishermen population belongs to backward caste (66.70%) followed by most backward caste (23.0%) (recorded only in Tamilnadu) and only a negligible (0.3%) group belong to other castes (observed only in Karnataka).

Table 16: Households studied by religion in states

| Name of state | Hindus | Muslims | Christian | Others | Total |
|----------------|--------------------|------------------|--------------------|----------------|---------------------|
| Andhra Pradesh | 1681 (93.4) | 0 (0.0) | 119 (6.6) | 0 (0.0) | 1800 (100.0) |
| Karnataka | 992 (98.1) | 10 (1.0) | 9 (0.9) | 0 (0.0) | 1011 (100.0) |
| Kerala | 131 (14.0) | 27 (2.9) | 777 (83.1) | 0 (0.0) | 935 (100.0) |
| Tamilnadu | 671 (39.9) | 132 (7.9) | 878 (52.2) | 0 (0.0) | 1581 (100.0) |
| Total | 3475 (64.0) | 169 (3.1) | 1783 (32.9) | 0 (0.0) | 5427 (100.0) |

Note 1: Figures in parenthesis are percentages

2: Variations between households studied by religion are significant ($\chi^2 = 2738.20$, $p < 0.001$)

It is observed the majority of the families follow Hinduism (64.03%), 32.85% of the families practices Christianity and only 3.1% of the families practices Islam. Christians constitute highest in Kerala followed by Tamilnadu. Andhra Pradesh and Karnataka are seen to be hindus mostly above 90%.

6. Ownership of house, land and water spread area

The data regarding asset ownership with respect to house, land and water spread areas are collected and presented in this section.

6.1 Ownership of house

The details regarding the ownership of house are presented in table 17

Table 17: House ownership details by states

| Name of state | Owned | Rented | Leased | Others | Total |
|----------------|--------------------|------------------|----------------|----------------|---------------------|
| Andhra Pradesh | 1767 (98.2) | 33 (1.8) | 0 (0.0) | 0 (0.0) | 1800 (100.0) |
| Karnataka | 945 (93.8) | 63 (6.2) | 0 (0.0) | 0 (0.0) | 1008 (100.0) |
| Kerala | 1245 (99.2) | 10 (0.8) | 0 (0.0) | 0 (0.0) | 1255 (100.0) |
| Tamilnadu | 1430 (85.1) | 245 (14.6) | 6 (0.3) | 0 (0.0) | 1681 (100.0) |
| Total | 5387 (93.8) | 351 (6.1) | 6 (0.1) | 0 (0.0) | 5744 (100.0) |

Note 1: Figures in parenthesis are percentages

2: Variations in ownership between states are significant $\chi^2 = 344.72$, $P < 0.001$

It is observed that most of the families (93.8%) live in their own house, whereas 6.1% of the families live in rented houses and a negligible (0.1%) of the population live in leased houses only in Tamilnadu about (15%) of the families have rented accommodations

6.2 Type of House

The details of different types of houses in which the respondents lived are presented in table 18

Table 18: Distribution of subjects by type of house

| Name of state | Thatched | Tiled | RCC | Others | Total |
|----------------|--------------------|--------------------|--------------------|----------------|---------------------|
| Andhra Pradesh | 740 (41.1) | 822 (45.7) | 238 (13.2) | 0 (0.0) | 1800 (100.0) |
| Karnataka | 156 (15.5) | 821 (81.4) | 31 (3.1) | 0 (0.0) | 1008 (100.0) |
| Kerala | 453 (36.1) | 587 (46.8) | 215 (17.1) | 0 (0.0) | 1255 (100.0) |
| Tamilnadu | 360 (21.4) | 666 (39.6) | 655 (39.0) | 0 (0.0) | 1681 (100.0) |
| Total | 1709 (29.8) | 2896 (50.4) | 1139 (19.8) | 0 (0.0) | 5744 (100.0) |

Note 1: Figures in parenthesis are percentages

2: Variations in type of house between states are significant ($\chi^2 = 943.43, p < 0.001$)

It is observed that most of the families (50.4%) live in tiled houses, while 29.8% of the families live in thatched houses and only 19.8% of the families live in RCC buildings. In Tamilnadu 78.6% of the families could avail tiled and RCC residential. In Andhra Pradesh only 41.1% of the families and 36.1% in Kerala could have thatched houses. RCC residence could be availed by 39% of the families in Tamilnadu.

6.3 Ownership of land

The data regarding the land ownership of the respondents are presented in table 19.

Table 19: Land ownership details of subjects investigated in the selected states

| Name of state | Owned | Leased | Landless | Total |
|----------------|--------------------|-----------------|--------------------|---------------------|
| Andhra Pradesh | 103 (5.7) | 0 (0.0) | 1697 (94.3) | 1800 (100.0) |
| Karnataka | 945 (93.8) | 63 (6.2) | 0 (0.0) | 1008 (100.0) |
| Kerala | 0 (0.0) | 0 (0.0) | 1255 (100.0) | 1255 (100.0) |
| Tamilnadu | 0 (0.0) | 0 (0.0) | 1681 (100.0) | 1681 (100.0) |
| Total | 1048 (18.2) | 63 (1.1) | 4633 (80.7) | 5744 (100.0) |

Note: Figures in parenthesis are percentages

It is observed that most of the families are (80.7%) landless, 18.2% of the families have own land (observed only in Andhra Pradesh and Karnataka) and a negligible proportion of families (1.1%) in Karnataka have leased their land holdings.

7. Participation in Aquaculture

Aquaculture is considered as the next best alternative to the fishing community offering scope for getting good remuneration. However, unlike open access fishery, aquaculture will not provide free access to all and one has to strive either to own suitable water spread area or to work in the farms. The details regarding the participation on aquaculture activities by the respondents were collected and are presented in table 20.

Table 20: Information on participation of subjects in aquaculture by states

| Name of state | Own farm | Leased farm | Labourer | None |
|----------------|------------------|----------------|------------------|--------------------|
| Andhra Pradesh | 155 (8.6) | 9 (0.5) | 132 (7.3) | 1504 (83.5) |
| Karnataka | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1008 (100.0) |
| Kerala | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1255 (100.0) |
| Tamilnadu | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1681 (100.0) |
| Total | 155 (2.7) | 9 (0.2) | 132 (2.3) | 5448 (94.8) |

Note: Figures in parenthesis are percentages

It is observed that most of the samples (94.8%) under the present study has no participation in aquaculture related activities. Only 2.7 per cent of the population had their own farms (observed only in Andhra Pradesh), 0.2 percent had leased farms and 2.3 per cent of the population worked as labourers in aquaculture farms (observed only in Andhra Pradesh). Overall only 5.2 per cent of the population covered in the present study has some participation in aquaculture activities.

8. Membership in Self Help Groups (SHG's)

The concept of SHG's –comparatively a recent introduction in the present day set up- has helped many people especially in the rural India. The National Bank for Agriculture and Rural Development (NABARD) encouraged this concept and offered all institutional support for the development of the rural community. Here the responsibility was entrusted to the women. The details regarding the membership in any SHG's by the respondents were collected and presented in table 21.

Table 21: Membership of subjects in women Self Help Groups in the selected states

| Name of state | Member | Not a member | Total |
|----------------|--------------------|--------------------|---------------------|
| Andhra Pradesh | 419 (23.3) | 1381 (76.7) | 1800 (100.0) |
| Karnataka | 223 (22.1) | 785 (77.9) | 1008 (100.0) |
| Kerala | 602 (48.0) | 653 (52.0) | 1255 (100.0) |
| Tamilnadu | 1096 (65.2) | 585 (34.8) | 1681 (100.0) |
| Total | 2340 (40.7) | 3404 (59.3) | 5744 (100.0) |

Note 1: Figures in parenthesis are percentages

2: Membership in self help groups is varying between states ($\chi^2=815.78, p<0.001$)

It is observed from the table that about 59.3 percent of the women are not members of women SHG's and the remaining 40.7 per cent of the women only are members of a few women SHG's operating in their localities. In Tamilnadu about 65% of the women only avail the membership in self help groups. More than 75% of the women could not avail the membership in the state of Andhra Pradesh and Karnataka. Keralites constitutes 48% with the membership in women self help groups.

9. SALIENT FINDINGS

The salient findings of this study are summarized below.

- The present study was conducted in 5744 households covering 27 villages in 13 districts of the 4 selected states.
- Andhra Pradesh lies on the east coast, Karnataka and Kerala lies on the west coast while Tamilnadu covers both east and west coast.
- Total coastal length of the study area is 2940 km and Tamilnadu has the longest coastline of 1076 km.
- Total number of landing centers is 1243; Andhra has the highest number of 508 and the lowest by Karnataka 34.
- Total number of coastal districts in the study area is 34.
- The total fisher population of the study area is 33,65,452, with an active fisher folk population of 8,45,354.
- There are a total 661 ice plants, 118 freezing plants, 214 processing plants, 594 peeling sheds and 106 other units mainly cold storage and net making units.
- There are 28,169 mechanized crafts, 35,938 motorized units and 1,23,877 traditional crafts in operation in the entire study area.
- Potential area available for aquaculture is 9,98,596ha with a production of 4,76,945 tones and a production rate of 0.48 t/ha.
- The average family size is 4.5.
- Presence of more youth aged between 7 and 25 years among the fisherwomen is reported in the study area.
- Literacy rate is reported to be 65.6%.
- 54.7 % of women in the study area are involved in fishery related activities.
- Majority of the fishing families belong to back ward community and most of them practice Hinduism.
- Most of the population live in own house and the tiled houses are more.
- Majority of the families are land less do not participate in aquaculture activities.
- Nearly 60.5% of fisherwomen earn between Rs.1000 and 2000 per month indicating a very low income and they are poor
- Most of the population are not members in women SHG's