# SOCIO-ECONOMIC STATUS OF FISHERS OF RESERVOIRS IN INDIA

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The present study is a rapid assessment of socio-economic status to estimate income, illiteracy and health of reservoir fishers in seven states of India. Structured data from 415 fishermen were collected. The result indicated that against the Indian average literacy rate of 74.52% the literacy rate of 63.32% was recorded among the sampled fishers. The school dropouts were more at secondary level of education (57.75%). Fishers' children were vaccinated in most of the states as per the recommendation of Indian Council of Medical Research. The average monthly expenditure of the households was worked out to be Rs. 3148.3 only, which is very low to sustain livelihood; often lead to indebtness.

Key words : Socio-economics, reservoir, fishers, income, literacy, health

## Introduction

India has constructed large number of dams across the country for generating power and for Irrigation. At present the total reservoir area in the country is 3.15 m ha, out of which small reservoirs occupy 1.49 m ha, followed by large (1.14 m ha) and medium reservoirs (0.52 m ha). These water bodies, due to their high biogenic production potential, form very important fisheries resources of the country and are highly conducive for fishery activities. Over the years, reservoir fisheries has played a great role in socio-economic development of the country as it contributes to income and livelihoods to a large section of economically underprivileged population in India. (FAO 1997; Thilsted *et al.,* 1997). It has also been recognized as a powerful income and employment generator in different fora. However, consistent, regular and reliable socio-economic information of the reservoir-dependent fishers are lacking. The objective of the study was to document the socio-economic status of reservoir fishers, mainly focusing on their status of literacy, health and income. The study will provide a framework of socio-economic parameters to the planners and policy makers for formulating suitable programmes for the upliftment of their socio-economic status.

## Materials and methods

The study focused on the households deriving their income and livelihood, partially or fully from fisheries and related activities. Multistage random sampling was done at first stage and states having significant reservoir area were picked to select the units of the sample (Hankin, 1984). At the second stage, important districts and area having the constituent water bodies were selected. Fig.1. shows the schematic diagram of the procedures followed in the selection of sample household of fishing community. Ultimately, the fishers operating in these inland waters were selected randomly to collect the primary data.
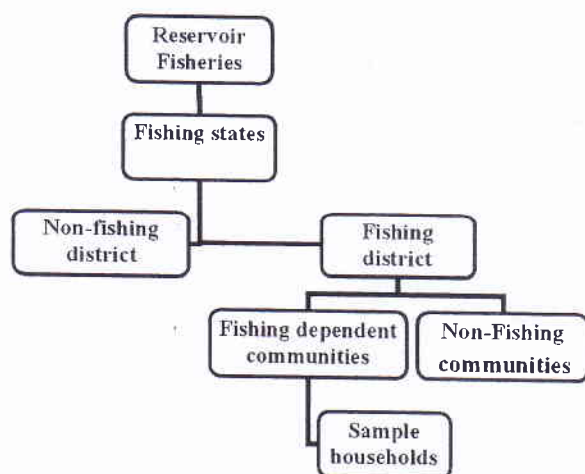
Fig.1. Sample selection of fishing dependent households

The study covered 415 respondent households from 7 states, *viz.* Andhra Pradesh (A. P.), Himachal Pradesh (H. P.), Jharkhand (JH), Kerala, Madhya Pradesh (M. P.), Tamil Nadu (T. N.) and Uttar Pradesh (U. P.). The total households representing reservoir capture fisheries sector is given in Table 1.The state wise sample size varied from 50 to 64 respondents. The sample size of Jharkhand was higher compared to other states as the fishermen of Jharkhand were heavily dependent on reservoir compared to other Inland resources.

*Data collection*

The study was based on the data collected mainly from primary sources through personal interview using comprehensive and pre-tested schedules.

*Variables and analysis*

The socio-economic indicators considered for the study were gender, age, literacy, health, employment, income, expenditure pattern, savings and indebtedness parameters. The household was taken as unit of analysis. Statistical techniques such as frequency distribution, mean, percentages were used to analyze the data.

## Results and discussion

*Demographic Details*

The age of the respondents were divided into three sub groups, *viz*, 15-35 year age group, 36-55 year age group and >56 year age group. Fishing was an activity mostly of fishers' in the age group of 36-55 years which constituted about 54.70 per cent of the respondents. The distribution also indicated the representation of young group (33.49 per cent) in fisheries activities. The fishers with age more than 56 had the least share with 11.81 per cent in total, indicating the personal difficulties of the fishing operation at old age. Since fisheries were a low income generating, laborious and risky enterprise, an occupational shift was observed for the younger groups. Among the sampled states, the percentage of younger people involved in active fishing was found to be comparatively less, on account of available alternative avocations and the diminishing popularity of fishing business among the younger generation; only in the state of Madhya Pradesh and Jharkhand considerable younger fishers (>44 percent) were involved in fishing activities. The percentage of middle aged group fishers was more than 40 per cent in almost all states. It was highest for Kerala and Tamil Nadu (70.59%) followed by Uttar Pradesh (62.00%). The old age fishers had highest percentage in Andhra Pradesh (26.92%), followed by Himachal Pradesh and Uttar Pradesh (18%). The result also indicated non - existence of old fisher in Kerala and Madhya Pradesh.

The family composition of the sample respondents is given in Table 2 which indicated that males outnumbered females in most of the states except in Jharkhand and Kerala. The male-female ratio for the entire sample was 1.03 and is in parity with the national scenario.

Table 1. Age distribution of the sample respondents of the households

| States | No.of households studied | Age Group (years) | | | |
|---|---|---|---|---|---|
| | | 15-35 | 36-55 | >56 | Total |
| Andhra Pradesh | 52 | 15 (28.85) | 23 (44.23) | 14 (26.92) | 52 (100.00) |
| Himachal Pradesh | 50 | 12 (24.00) | 29 (58.00) | 9 (18.00) | 50 (100.00) |
| Jharkhand | 97 | 43 (44.33) | 41 (42.27) | 13 (13.40) | 97 (100.00) |
| Kerala | 51 | 15 (29.41) | 36 (70.59) | 0 (0.00) | 51 (100.00) |
| Madhya Pradesh | 64 | 33 (51.56) | 31 (48.44) | 0 (0.00) | 64 (100.00) |
| Tamil Nadu | 51 | 11 (21.57) | 36 (70.59) | 4 (7.84) | 51 (100.00) |
| Uttar Pradesh | 50 | 10 (20.00) | 31 (62.00) | 9 (18.00) | 50 (100.00) |
| Total | 415 | 139 (33.49) | 227 (54.70) | 49 (11.81) | 415 (100.00) |

Note- Values in parenthesis are in percent age

Table 2. Family composition of the respondent households (Number)

| States | Male | Female | Total | Male - Female ratio | Average family size |
|---|---|---|---|---|---|
| Andhra Pradesh | 126 (51.85) | 117 (48.15) | 243 (100.00) | 1.08 | 5.06 |
| Himachal Pradesh | 97 (50.52) | 95 (49.48) | 192 (100.00) | 1.02 | 3.76 |
| Jharkhand | 221 (48.79) | 232 (51.21) | 453 (100.00) | 0.95 | 4.67 |
| Kerala | 103 (45.98) | 121 (54.02) | 224 (100.00) | 0.85 | 4.39 |
| Madhya Pradesh | 171 (53.44) | 149 (46.56) | 320 (100.00) | 1.15 | 5.00 |
| Tamil Nadu | 97 (50.52) | 95 (49.48) | 192 (100.00) | 1.02 | 3.76 |
| Uttar Pradesh | 122 (53.98) | 104 (46.02) | 226 (100.00) | 1.17 | 2.52 |
| Total | 937 (50.65) | 913 (49.35) | 1850 (100.00) | 1.03 | 4.25 |

Values in parenthesis are in percentage

The male-female ratio of both adult and children is also given in Fig. 2, which depicts that states like Andhra Pradesh, Himachal Pradesh and Jharkhand have uniform (more than 1) male-female ratio both for children and adults. In Kerala, male-female ratio is almost equal for both children & adult but ratio is less than one. In Tamil Nadu and Uttar Pradesh, the ratio is less for children that means females are more than males among children, whereas in adults the number of females is less than males. It is a good indication that the sex ratio among children is getting better.

The family size plays an important role in defining the demographic features of a particular area. For fishers of low income group, bigger family size means minimal access to basic needs like health, education, proper nutrition etc. The average family size of sample respondents' was worked out to be 4.25. Altogether 48.32 percent of the households belong to family size of 2-4 members per household. Andhra Pradesh (51.92%), Himachal Pradesh (66.67%), Kerala (54.90%) and Tamil Nadu (72.55%) have family size of 2-4 in more than 50 per cent of households except in Madhya Pradesh and Uttar Pradesh where family size of 4-6 is predominant with 48.44 and 42.00 percent respectively. Only 10 number of total respondents' household had more than 10 members in their families which indicates that most of the sampled population preferred small family size.
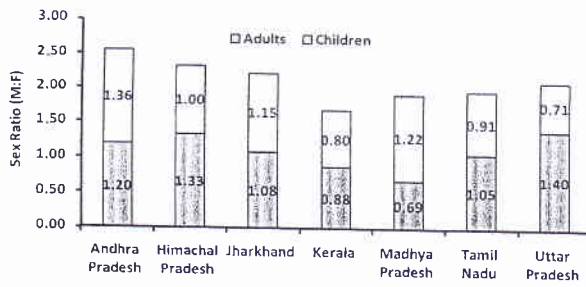
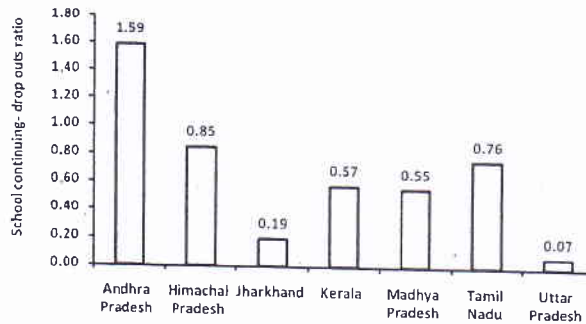Fig. 2. Comparative male- female ratio among adults and children



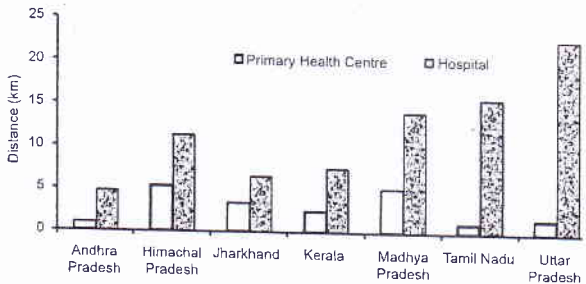Fig. 3. Continuing-drop out ratio of sample respondents (statewise)



Fig. 4. Access to health care

*Literacy and education attainment*

The literacy status includes the level of education as indicated by primary, secondary and collegiate level. The primary level indicated schooling till fourth grade, secondary level indicated by high school, secondary and vocational education. The college level of education was denoted by college and professional education. The literacy status of the respondent households was analyzed through the literacy level, continuing and dropouts and access to educational facilities. The illiterate indicates fisher without any formal education and doesn't even possess functional literacy. The details of education attainment are given in Table 3.

The current literacy rate of India as a whole is 74.52 per cent (Census, 2011), but the literacy rate of different states in the present study indicated a diverse scenario. The states like Andhra Pradesh, Madhya Pradesh, Jharkhand and Uttar Pradesh had literacy rate below 70 percent. The states of Himachal Pradesh, Kerala and Tamil Nadu showed high literacy rate with 88, 90.5 and 76.60 percent respectively. The continuing out drop ratio (Fig. 3) of sampled respondents revealed that states like Jharkhand, Uttar Pradesh had more dropouts with ratio 0.19 and 0.07 respectively.

*Health situation*

The health status of the respondent households was studied based on the parameters like administration of vaccines, failure to vaccination, incidence of common diseases and special ailments. The average age of administration of various vaccines varied among states (Table 4). The incidence of discontinuation was found in the states of Himachal Pradesh, Jharkhand and Uttar Pradesh and Andhra Pradesh. The maximum incidence of discontinuation was observed for MMR with 13.33 followed by pox and polio with 11.30 percent and 11.11 percent respectively. The states having high literacy rates have nil incidence of discontinuation as compared to states with less literacy rate.

Literacy plays an important role in creating awareness for understanding the health care facilities *etc.* Distance also plays an important role in availing the health care facilities, therefore the

Table 3. Education attainment of reservoir fishers.

| Districts | Total | Illiterate | Literate | Primary level* | Secondary level* | College level* |
|---|---|---|---|---|---|---|
| Andhra Pradesh | 238 (100.00) | 119 (50.00) | 119 (50.00) | 35 (29.41) | 64 (53.78) | 20 (16.81) |
| Himachal Pradesh | 50 (100.00) | 6 (12.00) | 44 (88.00) | 32 (72.73) | 11 (25.00) | 1 (2.27) |
| Jharkhand | 410 (100.00) | 175 (42.68) | 235 (57.32) | 121 (51.49) | 105 (44.68) | 9 (3.83) |
| Kerala | 211 (100.00) | 21 (9.95) | 190 (90.45) | 53 (27.89) | 131 (68.95) | 6 (3.16) |
| Madhya Pradesh | 279 (100.00) | 141 (50.54) | 138 (49.46) | 115 (83.33) | 23 (16.67) | 0 (0.00) |
| Tamil Nadu | 188 (100.00) | 44 (23.40) | 144 (76.60) | 40 (27.78) | 93 (64.58) | 11 (7.64) |
| Uttar Pradesh | 50 (100.00) | 17 (34.00) | 33 (66.00) | 23 (69.70) | 4 (12.12) | 6 (18.18) |
| Total | 1426 (100.00) | 523 (36.68) | 903 (63.32) | 419 (46.40) | 431 (47.73) | 53 (5.87) |

Note- values in parenthesis are in percentage
* values in parenthesis are in percentage w.r.t. literate population only

Table 4. Average age of vaccine administration and incidence of discontinuation (percentage)

| States | Pox | | BCG | | MMR | | Polio | | Others | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Age (years) | IOD (%) | Age (years) | IOD (%) | Age (years) | IOD (%) | Age (years) | IOD (%) | Age (years) | IOD (%) |
| Andhra Pradesh | 1 | 5.3 | 1 | 2.1 | 1 | 1.2 | 5 | 0 | - | - |
| Himachal Pradesh | 3.08 | 6.67 | 0.54 | 8.89 | 1.30 | 13.33 | 4.94 | 11.11 | 5.43 | 9.37 |
| Jharkhand | 1.00 | 11.30 | 1.00 | 3.00 | 1.00 | 3.00 | 5 | 0 | - | - |
| Kerala | 0.44 | 0 | 0.73 | 0 | 0.57 | 0 | 2.58 | 0 | - | - |
| Madhya Pradesh | 1.00 | 0 | 1 | 0 | 1.00 | 0 | 5 | 0 | - | - |
| Tamil Nadu | 0.88 | 0 | 0.42 | 0 | 0.50 | 0 | 3.85 | 0 | - | - |
| Uttar Pradesh | 1.33 | 30.43 | 0.21 | 0 | 0.82 | 0.00 | 3.5 | 0 | 0.6 | 0 |
| Average | 1.25 | 7.67 | 0.70 | 2.00 | 0.88 | 2.50 | 4.27 | 1.59 | 0.86 | 1.34 |

IOD- Incidence of discontinuation (The percentage of sampled population discontinued administration of vaccines)
POX, BCG, MMR, POLLO, Others

nearest District hospital or Primary health centre (PHC) from the respondent's household was recorded. (Fig. 4). The average farthest distance was documented in states of Himachal Pradesh, Madhya Pradesh and Jharkhand with 5.33, 5.2 and 3.4 km respectively. The distance of District hospital varied from 4.8 km in Andhra Pradesh to 22.75 km in Uttar Pradesh.

The annual frequency of incidence of disease of the respondent household was shown in Table 5. Fever flu, body ache, diahhorea, and other gastroenteric problems were common diseases observed in almost all states. Skin problem was highest in female respondents in Uttar Pradesh with

an annual frequency of 6.09. The incidence of anaemia was found in females of Jharkhand with an annual frequency of 0.13 in a year. In Jharkhand, 6 cases of cardiac failure in males and 5 cases of TB in females were documented among sample respondents. In M.P. four cases of cardiac failure were noted.

*Occupational status*

Occupational status showed the contribution of different income sources in supporting livelihood of the household. In addition to the primary occupation *i.e.* fishing, the fishers of reservoir were engaged in other activities. The major non-fishing

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Table 5. The annual frequency of incidence (No. of times occurred in a year) of diseases

| Disease | Andhra Pradesh | | Himachal Pradesh | | Jharkhand | | Kerala | | Madhya Pradesh | | Tamil Nadu | | Uttar Pradesh | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | F | M | F | M | F | M | F | M | F | M | F | M | F |
| Fever/Flu | 1.08 (37) | 1.27 (37) | 2.05 (47) | 0.14 (2) | 1.38 (67) | 1.39 (75) | 1.96 (80) | 1.18 (67) | 3.60 (64) | 4.80 (63) | 2.305 (81) | 3.11 (72) | 3.15 (86) | 4.02 (79) |
| Body aches | 3.06 (32) | 4.6 (39) | 1.02 (34) | 0.39 (6) | 0.57 (25) | 0.17 (9) | 1.16 (61) | 0.70 (53) | 3.70 (9) | 2.50 (2) | 1.31 (69) | 1.44 (25) | 3.43 (43) | 4.11 (48) |
| Diarrhoea | 1.04 (24) | 1.22 (27) | 0.20 (14) | 0.29 (6) | 0.01 (1) | 0.08 (5) | 0.11 (11) | 0.05 (6) | 5.00 (2) | 4.50 (2) | 2.33 (6) | 6.00 (1) | 4.13 (35) | 5.25 (30) |
| Other gastro-enteric diseases | 3.3 (3) | 3 (6) | 0.52 (14) | 0.25 (8) | 0.61 (28) | 0.53 (27) | 0.63 (25) | 0.26 (13) | 3.80 (4) | 4.30 (3) | 2.63 (4) | 4.43 (14) | 7.44 (32) | 21.5 (8) |
| Skin disorders | - | - | 0.29 (14) | 0.19 (4) | - | 0.11 (6) | 0.50 (12) | 0.14 (5) | 4.00 (1) | 5.70 (3) | 5.85 (13) | 0.20 (4) | 24.0 (14) | 6.09 (37) |
| Cardiac failure | - | - | 0.02 (1) | 0.02 (1) | 0.06 (6) | 0.0 (2) | 0.02 (3) | - | 6.30 (4) | - | - | - | 30.0 (1) | - |
| TB | - | - | 0.02 (1) | - | 0.01 (1) | 0.05 (5) | - | 0.01 (1) | 6.40 (5) | 8.00 (1) | 0.50 (1) | - | 180 (1) | 60.0 (1) |
| Anaemia | - | - | - | - | 0.05 (3) | 0.13 (8) | 0.01 (2) | 0.01 (1) | 4.30 (3) | 3.50 (2) | - | - | - | - |
| Diabetes | - | - | 0.02 (1) | - | - | - | - | - | - | - | - | - | - | - |
| Blood pressures | - | - | 0.06 (3) | - | - | - | - | - | - | - | - | - | - | - |
| AIDS | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Others | - | - | - | 0.02 (1) | 0.20 (11) | 0.05 (3) | 0.16 (6) | 0.20 (4) | 3.70 (6) | 3.70 (3) | - | - | 120 (1) | 154 (2) |

M- Male, F-Female

Note- values in parenthesis represent no. of affected persons in the sample population

activities in which fishers involved themselves were labour, agriculture, business, and other service sectors with a contribution of 54.51, 18.68, 16.26, and 10.55 per cent respectively to family income. In the States of Andhra Pradesh and Uttar Pradesh, more than 85 percent of fishers were involved in activities other than fisheries. Only in the state of Madhya Pradesh the respondent's involvement in non-fishing activities was very low, *i.e.* 5.71 percent. Overall, the fisheries activities itself was not able to support livelihood of the fisher.

*Income and expenditure pattern*

The income and expenditure pattern of the respondent household was analyzed using the monthly income and expenses across the sampled reservoir states of India (Table 6). The data revealed that the total monthly income was highest in Andhra Pradesh followed by Uttar access to resources might be the major determinants of levels of low socio-economic status. (Ruddle 1994, 1998; Béné 2003). The fuller utilisation of the human power potentiality can be achieved through infrastructure, investments, technology intensification, diversification and value addition. Various issues related to fishing activities in India need to be addressed in a time bound manner with mutual understanding and cooperation between public and private sectors.

Pradesh, Himachal Pradesh and Tamil Nadu. The income was lowest in Madhya Pradesh (Rs. 533.60) which was below poverty line. The income-expenditure ratio of Andhra Pradesh and Uttar Pradesh was less than one which meant their expenditure was more than their monthly earnings. Expenditure was measured for 8 most common expenses *i.e.* food and materials purchased and consumed at home and elsewhere, clothing, fuel, medicines, education, entertainment, personal expenses and consumer durable items and did not includes expenses towards business purposes. The expenditure pattern of the respondent household is given in Table 7. According to Deaton and Muellbauer (1980), poorer the household the higher the share of total income or consumption assigned to food. It was observed that the fisher of almost all the states spends their maximum earnings on food. The fishers in the state of Andhra Pradesh with highest income spent the least (39.93 per cent) on food as compared to other states, and whole in Madhya Pradesh with very low income spent more than 55 percent of their earning on food items. This agrees with the well known finding that as household income increases, the percentage of expenditures on food decreases (Engel, 1957). The fishers of Tamil Nadu spend 16.45 percent of their income on medical charges. Though the income of fisher of M.P. is less, they spent 19.55 per cent of their income on personal items and 7.77 percent on entertainment, while expenditure on education was only 3.63 percent. Despite low income, spending on these items indicated their indulgence in ill habits like liquor consumption, chewing of pan, Gutka, tobacco *etc.*

*Saving and debt position*

The study indicated that 48.49 per cent of the respondents had no savings. Around 29.43 per cent of the respondent households could save an amount of less than Rs 50,000 per annum and
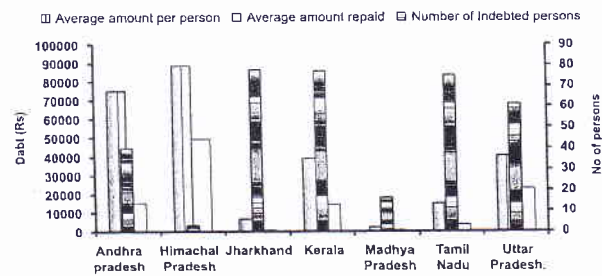


Fig. 5. The debt scenario of respondent's household of different states

18.73 per cent of the respondents have an annual saving of Rs 50 thousand to 1 lakh. Around 3.34 per cent of the respondent households had a savings of more than one lakh rupee. It was found that the frequency of respondents possessing savings varied across the states from zero in Andhra Pradesh and 92.16 percent in Kerala. In Jharkhand, U.P. and M.P., the percentage of respondents having savings were high (= 75 percent) but the amount saved were very low (< Rs. 5000) due to stumpy income levels. On the contrary, the percentage of respondents having reserves with more savings was found in the state of Himachal Pradesh. The lack of savings and the need for the sustenance of the livelihood often lead to indebtedness given in Fig.5. The results indicated that the highest average amount of indebtedness was recorded in Himachal Pradesh with Rs. 88750 per annum and lowest in Jharkhand with Rs. 6547 per annum. The highest number of respondents who borrowed money for different purposes was found in Jharkhand (78), followed by in Kerala (77) and Tamil Nadu (75) In Himachal Pradesh though the persons availed credit was less (3 nos.) but the credit amount was highest as compared to the other sampled states.

**Conclusion**

The study showed that the literacy rate of reservoir fishers was less than the average national literacy of the country. Low income from

Table 6. Monthly income (Rs.) of respondent households

| Enterprise | Andhra Pradesh | Himachal Pradesh | Jharkhand | Kerala | Madhya Pradesh | Tamil Nadu | Uttar Pradesh |
|---|---|---|---|---|---|---|---|
| Fishery | 5515.47(56.51) | 1512(40.91) | 467.2(64.23) | 1284.4(82.20) | 530.5(99.42) | 1593.61(85.12) | 1942(49.95) |
| Labour | 2983.85(30.57) | 832(22.51) | 131.2(18.04) | 206.49(13.21) | 3.1(0.58) | 254.18(13.58) | 844.5(21.72) |
| Agri-culture | 929.1(9.52) | 595(16.10) | 57.5(7.90) | 9.88(0.63) | 0(0.00) | 0(0.00) | 498.5(12.82) |
| Business | 331(3.39) | 480(12.99) | 71.5(9.83) | 17.48(1.12) | 0(0.00) | 0(0.00) | 474.5(12.82) |
| Any others | 0(0.00) | 277(7.49) | 0(0.00) | 44.36(2.84) | 0(0.00) | 24.43(1.30) | 128(3.29) |
| Total Income | 9759.42 (100.00) | 3696 (100.00) | 727.4 (100.00) | 1562.61 (100.00) | 533.6 (100.00) | 1872.22 (100.00) | 3887.5 (100.00) |
| Expenditure | 1654.48 | 2437 | 604.5 | 957.52 | 517.6 | 1003.66 | 4420 |
| Income-expenditure ratio | 0.84 | 1.52 | 1.20 | 1.63 | 1.03 | 1.87 | 0.88 |

Note - values in parenthesis are in percentage

Table 7. Expenditure (Rs.) pattern of respondent households

| Expenditure Items | Andhra Pradesh | Himachal Pradesh | Jharkhand | Kerala | Madhya Pradesh | Tamil Nadu | Uttar Pradesh |
|---|---|---|---|---|---|---|---|
| Food | 4653.77(39.93) | 995(40.83) | 335.9(55.57) | 482.74(50.42) | 289.9(56.01) | 485.36(48.36) | 2070(46.83) |
| Clothing | 1420.57(12.19) | 265(10.87) | 25.6(4.23) | 37.69(3.94) | 28.5(5.51) | 81.73(8.14) | 417(9.43) |
| Fuel | 480.6(4.12) | 54(2.22) | 62.2(10.29) | 29.32(3.06) | 0(0.00) | 57.21(5.70) | 161(3.64) |
| Medical | 1333.11(11.64) | 260(10.67) | 19.9(3.29) | 35.51(3.71) | 37.7(7.28) | 165.1(16.45) | 321(7.26) |
| Education | 1961.08(16.83) | 324(13.30) | 43.9(7.26) | 55.08(5.75) | 18.8(3.63) | 74.87(7.46) | 210(4.75) |
| Entertainment | 309.85(2.66) | 53(2.17) | 33.3(5.51) | 23.09(2.41) | 40.2(7.77) | 11.9(1.19) | 254(5.75) |
| Personal | 416.83(3.58) | 233(9.56) | 54.7(9.05) | 106.28(11.10) | 101.2(19.55) | 51.2(5.10) | 629(14.23) |
| Consumers Durables | 1078.67(9.26) | 253(10.38) | 29(4.80) | 187.81(19.61) | 1.3(0.25) | 76.29(7.60) | 358(8.10) |
| Total | 11654.48 (100.00) | 2437(100.00) | 604.5(100.00) | 957.52(100.00) | 517.6(100.00) | 1003.66(100.0) | 4420(100.00) |

Note- values in parenthesis are in percentage

fisheries, combined with high labour and risk, compelled the young working group to shift occupation towards non-fishing activities. The monthly expenditure pattern of the households was also too low to sustain livelihood of the household. Thus, there is greater need to transform the sector by taking into account its achievements and capabilities. More than the harvest of fish or other resources, local institutions and power structure that control.

## Acknowledgements

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