Coldwater Fisheries

05

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The background

The potential cold areas in India include the long stretch of Himalayas of around 2500 km from west to east and 200-400 km from north to south comprising an area of 594,400 km^2. These area have different types of coldwater resources: upland streams, rivers, high and low altitudinal lakes and reservoirs located in different hill states of India. Around 8,243 km long streams and rivers, 20,500 ha natural lakes, 50,000 ha of reservoirs both natural and manmade and 2500 ha brackishwater lakes at high altitude inhabits large population of indigenous and exotic coldwater fish species in these mountain water bodies which have immense potential for aquaculture practices as well as capture fisheries. The temperature limits of such water bodies are 10-20 ^{0}C with an optimum range from 10-12 ^{0}C. These water bodies are situated about 914 m above mean sea level in India. The mountain areas are mostly landlocked; hence the fish of lakes, streams, rivers and reservoirs are an important source of animal protein. Even though there are certain limitations of cold water fisheries such as accessibility, difficult hilly terrain, lack of proper market, recent success of developing aquaculture in mountain areas of India shows that fish farmers in the rural areas can become the direct beneficiaries of the implementation of inexpensive aquaculture technologies, and as a consequence they achieve significant improvement in their standard of living. As fisheries play an important role in providing food and income to people in mountain areas, they must be integrated into the rural development and water resource development initiatives. The majority of dependents on fish as means of livelihood are now facing problems to meet their both ends owing to sharp decline in fish catch in the upland areas. Keeping in view the squeezing land and burgeoning human ratio, mountain fish resource base is of great relevance and development of such areas becomes matter of national concern, which needs different technological approach and support services. Such regions have to be tapped for increased fish production for national basket and rural development in hills.

In the Indian Sub-continent two main types of trout's viz. brown trout (*Salmo trutta fario*) and rainbow trout (*Oncorhynchus mykiss* (Walbaum)), were transplanted from Europe by British settlers around the beginning of the last century primarily to meet their needs for sport fishing or recreational angling. These introductions in the hill states could be considered as the formal

beginning of coldwater fisheries development in India. For many decades the mere intention remained was to develop recreational fisheries to satisfy the needs of anglers for sports. Later on, these species were being cultured for food and hatcheries were setup for the production of seed. The development of hill fisheries thus started in the selected locations particularly in the Kashmir valley and some parts of the peninsular India. The breeding and culture techniques for the rainbow and brown trouts were standardized and now being practiced with great success and accuracy.

The aquatic resources available are quite valuable for the development of fishery both for food and sport, but scientific management of these resources is necessary to achieve the objectives. In order to manage these ecosystems, so that they can contribute to fishery development in remote hilly regions on a sustainable basis, the following issues need attention.

• Low level of production
• Lack of Infrastructure for aquaculture
• Availability of seed for production
• Introduction of new candidate species for aquaculture
• Habitat destruction
• Wanton destruction
• Aquatic pollution
• Conservation policy
• Management policy
• Climate change

There is a vast scope and potential in improving fish production in hills by bringing natural Himalayan lakes, located at different altitudes, under scientific management for fishery enhancement. This would actually reduce the gap between actual fish yield and production potentials. Through application of modern techniques, significant scope exists for promoting trout farming, which in long run, will have both domestic and export demand. There is also a great potential for sport fishery development and ecotourism in hilly regions. Use of modern techniques such as molecular and biotechnological intervention, selective breeding programme for improvement of strains both of exotic and indigenous species, cold water fish health management for the containment of diseases have now become imperative. Providing decision support system using GIS and remote sensing would be helpful not only for resource assessment but also for aquaculture development in the hills. Ornamental fish culture for small-scale enterprises in the hills can provide an alternative source of employment. The upland regions are fragile in nature therefore it has to be conserved and must be used on a sustainable basis.

Scope of the study

The socio-economic study of hill fishing populace is one of the rarest, this pilot study will provide a baseline information and framework for drawing suitable programmes for the upliftment of traditional fisher folk with particular focus on their literacy, health, employment and income profiling. In short, the study will be highly useful to researchers, planners and policy makers in overcoming the problems of the socio economic parameters which determines the sustained development of the fisher folk.

Objective

The overall objectives of the study is to document the socioeconomic status of fishers in cold regions of the Indian states including Himachal and Uttarakhand. However the specific objectives are to assess the status of literacy, health and income of inland fishers in India.

Duration of the Study

The study was conducted during the period from July 2010 to March 2011.

Methodology

The study was based on the data collected from primary and secondary sources. The primary data was collected from selected respondents using comprehensive and pre-tested questionnaires. The primary data had provided concise, clear, complete, and unbiased information about the respondent. The important variables considered for the study were gender, age, literacy, health, employment, income and indebtedness parameters

The distribution of cold water fisheries resources in India mentioned include rivers, ponds and lakes. The study covered 50 respondent households from two states Himachal Pradesh and Uttarakhand.

The sampling was done with random sampling method from the selected states, according to the magnitude of resource in that state. At the second stage important districts and area having the constituent water bodies were selected. Ultimately, the fishers operating in these inland waters were selected to collect the primary data. The study covered primarily the river and lake in Himachal and aquacultural resources in Uttarakhand. Combined information of all the selected states are presented for study parameters. The total households representing the coldwater fisheries and aquaculture sector and the distribution of the sample household is given in Table 5.1.

Table 5.1 Resource wise distribution of sample respondents in inland capture fisheries sector

SL. No.	State	Resource	Districts	Sample size
1.	Himachal Pradesh	River	Shimla, Sirmaur	25
2.	Uttarakhand	Aquaculture ponds	Champawat	25
3.	Total			50

Data Collection

The data collection was done using a pre structured survey schedule (Annexure-I) after a reconnaissance survey from the selected sample respondents. The data was collected on four parameters viz., the general particulars, literacy, health, and income profiling. It covered mostly rural. The data collection was done by the project team and trained enumerators. The data collected were tabulated and the results were analyzed.

Tools of Analysis

The data obtained from the respondents were systematically tabulated for the purpose of analysis. Conventional tools of analysis and percentage analysis was done to process the data and bring out the literacy, income and health status of the fishers in India and to arrive at meaningful conclusions.

Limitation of the study

The present study relied on primary data collected through the questionnaire survey. The inherent faults and limitations in the primary data collection like respondents' recall bias - due to the absence of proper records on their income, health details, expenditure, savings and indebtedness, etc with the respondents are to be recognized. The information was collected from the respondents based on their memory and experience and so the bias cannot be eliminated fully. But in the context of the study, care was taken to avoid personal bias while giving information. Apparent limitations like getting only seasonal information; having data that is for a specified period of time, depending on data that is word of mouth (with its inherent contradictions) as primary data should be considered. The income and expenditure pattern and health parameters of the respondents, subject to change in the short run as well as long run, also needed to be considered. This study was confined to the two randomly selected states of India.

Results and Discussions

The results and discussions are presented under the following heads

A.   General particulars
B.   Literacy status
C.   Health status
D.   Income status

A. General particulars

The general particulars of respondent households included age, family size, family composition etc.

(i) Age distribution

The age distribution of the respondent households is given in Table 5.2. The age of the respondents are categorized into three sub groups viz, young (15-35 year), middle age (36-55 year) and old (>56 year). In cold water fisheries, fishing continued to be an activity mostly done by fisher folk in the age group of 36-55 which constituted about 56 per cent of the respondents. The distribution also indicated that the group of young constituted (age less than 35) 32 & 20 per cent in Himachal & Uttrakhand, respectively. The fisher folk with age more than 56 were found to be only 12 & 24 per cent in the sampled state respectively. The average age of the cold water fishers was in the age group of 36-55 years.

Table 5.2: Age wise details of the sample respondents (years)

SL. No.	State	<=35	36-55	>=56	Total
1.	Himachal	8	14	3	25
		(32.00)	(56.00)	(12.00)	(100.00)
2.	Uttrakhand	5	14	6	25
		(20.00)	(56.00)	(24.00)	(100.00)
3.	Total	13	28	9	50
		(26.00)	(56.00)	(18.00)	(100.00)

Figures in parentheses indicate percentage to total
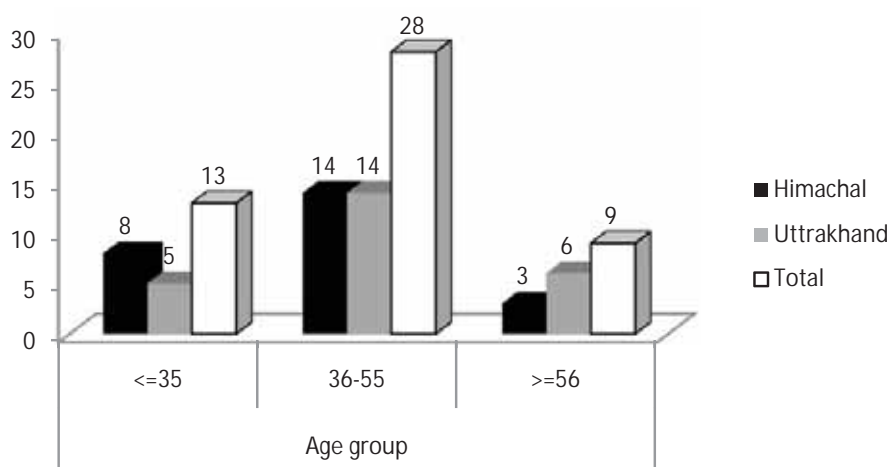

Figure 5.1: Age distribution of the sample respondent

(ii) Family composition

The family composition of the respondents is indicated in Table 5.5 and Fig. 5.2. It is seen from the table that the males surpassed the females in both the states. The average per cent of male and female in cold water fisheries was recorded at app. 60 & 40 per cent, respectively. The male female ratio was calculated to be 1.25 in Himachal and 1.89 in Uttrakhand together contributed to an average ratio of 1.47.

Table 5. 3: Household particulars of the sample respondents- male and female (Number)

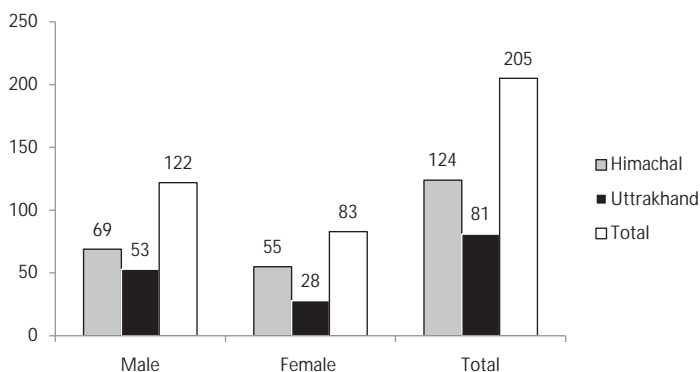| Sl.No.	State	House-holds	Male	Female	Total	Male-Female ratio
1.	Himachal	25	69	55	124	1.25
			(55.65)	(44.35)	(100.00)	
2.	Uttrakhand	25	53	28	81	1.89
			(65.43	(34.57)	(100.00)	
3.	Total	50	122	83	205	1.47
			(59.51	(40.49)	(100.00)	

Figures in parentheses indicate percentage to total

Figure: 5.2 Family composition of the respondent households-Male and Female (Number)

(iii) Family size composition

The average size of cold water fisheries in India is worked out to be 4.10 ranging from 3.24 in Uttrakhand and 4.96 in Himachal (Table 5.4 & Figure 5.3). The distribution of family type and family size of the respondents exhibited that 44.00 per cent of the total respondents were from small family having a size between 5 and 6. It was found that 42 per cent of the respondents belonged to the category of family size between 2 and 4. The results indicated that medium families and nuclear families were the characterstics in Himachal and Uttarakhand and are of almost similar fashion.

Table 5.4: Family size of the respondent households (Number)

Sl. No.	State	Sample	Family Size					Total	Average family size
			<2	2-4	5-6	7-10	>10		
1.	Himachal	25	0	8	15	2	0	25	4.96
			0	32.00	60.00	8.00	0.00	100.00	
2.	Uttrakhand	25	4	13	7	1	0	25	3.24
			16	52.00	28.00	4.00	0.00	100.00	
3.	Total	50	4	21	22	3	0	100	4.10
			8.00	42.00	44.00	6.00	0.00	100.00	

Figures in parentheses indicate percentage to total

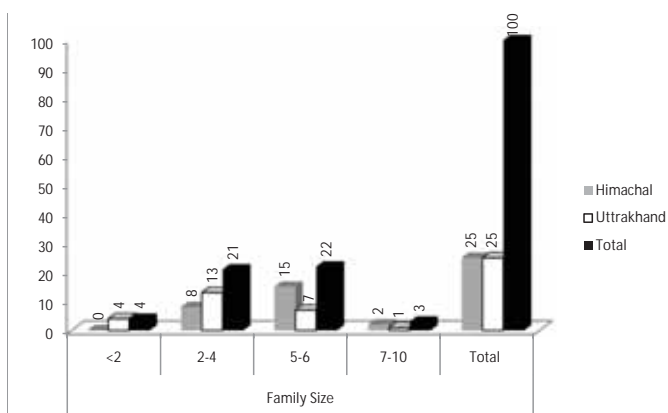

Figure 5. 3: Family size of respondent households

(iv) Age composition

The age composition of the respondent households is represented in Table 5.5. The age composition is represented by adults (more than 15 years) and children (less than 15 years). The table depicts that among male 68.85 were adults and 31.15 were children while among females 66.27 per cent were adults and 33.73 were children which is almost same in both the cases of sampled population.

Table 5.5: Age composition of the respondent households (Number)

Sl. No.	State	Adult (> =15 years)		Children (< 15 years)		Total		Dependency ratio
		Male	Female	Male	Female	Male	Female	
1.	Himachal	48 (69.57)	35 (63.64)	21 (30.43)	20 (36.36)	69 (55.65)	55 (44.35)	2.02
2.	Uttrakhand	36 (67.92)	20 (71.43)	17 (32.08)	8 (28.57)	53 (65.43)	28 (34.57)	2.24
3.	Total	84 (68.85)	55 (66.27)	38 (31.15)	28 (33.73)	122 (59.51)	83 (40.00)	2.11

Figures in parentheses indicate percentage to total

But the state wise distribution of dependency ratio (Figure 5. 4 & 5.5) illustrates that the adult-child ratio was found to be 2.11 for the total samples. The dependency ratio was higher for Uttrakhand (2.24) than that of Himachal Pradesh(2.02).
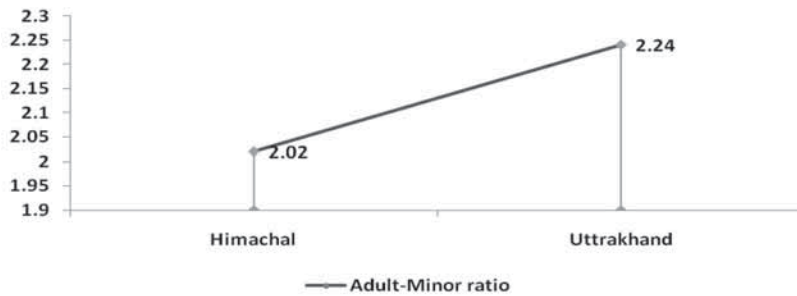

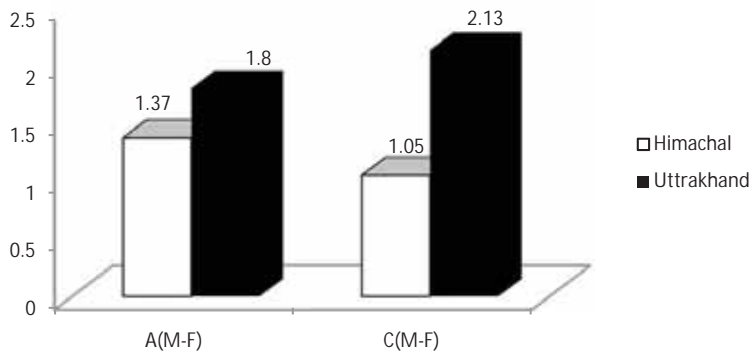Figure: 5.4: Dependency ratio of the respondent households

Figure 5.5: Male-Female ratio among adults and children

B. Literacy profile

(i) Literacy status

The literacy status includes the level of education as indicated by primary, secondary and collegiate. The primary level indicated schooling till fourth grade, secondary level indicated by high school, secondary and vocational education. The collegiate level of education was denoted by college and professional education.

The general literacy rate of India as a whole was 74.52 per cent (Census-2011) against the literacy rate of 75.81 per cent among the fisher folk (Table 5.6 & Figure 5.6). The results indicate that among the literates 37.67 per cent have primary level of education, 25.58 per cent have secondary level of education and remaining has collegiate level of education. Persons with collegiate education was more in Uttrakhand (25.25 per cent) and that with high school education was more in Himachal Pradesh (41.86 per cent). The state having maximum number of primary educated people was also found in Himachal Pradesh with 55.81 per cent.

Table 5.6: Literacy profile of the respondent families (Number)

State	State	Total	Illiterate	Literate	Literacy level		
					Primary	Secondary	Collegiate
1.	Himachal	116	30	86	48	36	2
			(25.86)	(74.14)	(55.81)	(41.86)	(2.33)
2.	Uttarakhand	99	22	77	33	19	25
			(22.22)	(77.78)	(33.33)	(19.19)	(25.25)
3.	Total	215	52	163	81	55	27
			(24.19)	(75.81)	(37.67)	(25.58)	(12.56)

Figures in parentheses indicate percentage to total

The state wise literacy rate of the respondents is represented in Figure 5.6. It shows that literacy rate of the respondents of Uttarakhand were marginally high at 77.78 per cent whereas for Himachal Pradesh it was recorded 74.14 per cent.
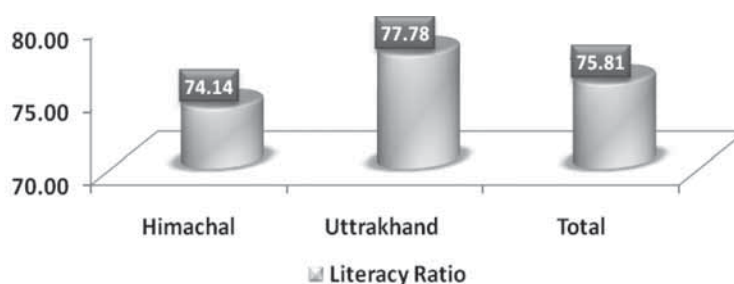

Figure 5.6: Literacy rate of the respondent's household

(ii) Educational profile

The information on education of the respondents in terms of continuance and discontinuance of education would provide the scope of employment, opportunities, possible migration, and alternative employment options of the sample households. Thus, continuing

and dropout ratios were calculated among the respondent households across the selected coldwater states. The continuing drop out ratio indicated the level of growing importance of education between the past and the present.

The dropouts were more at primary level of education with 38.26 per cent (Table 5.7 and Figure 5.7). It was higher in Himachal with 41.86 per cent and in Uttrakhand it was 33.33 per cent. The dropout at secondary level of education was about 19.46 per cent ranging from 24.42 per cent at Himachal Pradesh to 12.70 per cent at Uttrakhand. The dropout at collegiate level was found to be 4.70 per cent and it varied from 1.16 at Himachal Pradesh to 9.52 per cent at Uttrakhand.

It was found that the tendency to drop out education was more with primary education followed by secondary primary and least with collegiate education. This is on account of generating source of employment in fisheries related activities with secondary education as there was no other means of education and also due to following the traditional employment available. Collegiate education provided a source of alternate employment and another means of livelihood.

Table 5.7: Education of respondent households - Continuing and Dropout (Number)

Sl. No.	State	Continuing / Completed	Drop outs			Total
			Primary	Secondary	Collegiate	
1.	Himachal	28	36	21	1	86
		(32.56)	(41.86)	(24.42)	(1.16)	(100.00)
2.	Uttrakhand	28	21.00	8.00	6.00	63.00
		(44.44)	(33.33)	(12.70)	(9.52)	(100.00)
3.	Total	56	57	29	7	149
		(37.58)	(38.26)	(19.46)	(4.70)	(100.00)

Figures in parentheses indicate percentage to total

The improved ratio measures the increasing level of awareness of education among the households. It was found that the continuing-dropout ratio was the highest for Uttrakhand recorded at 0.80 per cent whereas, Himachal Pradesh recorded at 0.48 per cent. The results indicated that there exist increased enrolments in the present generation when compared to the past. But the possibility of seeking employment can be the reasons for the increasing dropouts among the sampled states.
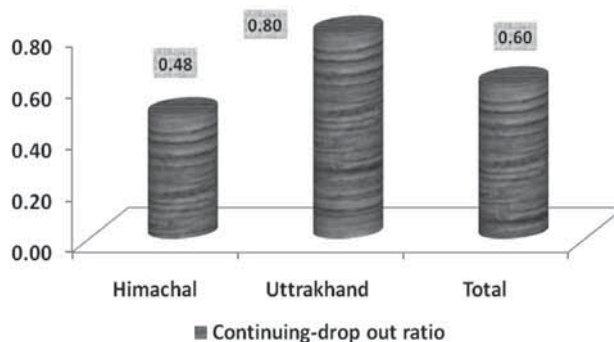

Figure 5. 7: Continuing Dropouts ratio among respondent households

(iii) Access to educational institutions

Access to education is an important yardstick to measure the socio-economic well being of a society. The proximity of the educational institutions like primary school, high school, college, and professional college provides a major impetus when it comes to continuing education. That was something the fisherfolk were said to be denied earlier which was disproved by the findings of the study.

The access to education was analyzed by finding the distance to nearby educational institutions. The average distance from fishing villages to nearly primary, high school, college and professional institution are given in Table 5.8. As a whole the average distance to a primary school is 1.38 km, high school 3.22 km, college 21.04 km, and professional institution 27.79 km from fishing villages in India. The distance for primary schools ranges from 1.24 km in Himachal Pradesh to 1.52 km in Uttrakhand. The average distance to high school ranges from 2.45 km in Himachal Pradesh to 3.98 km in Uttrakhand. With regards to colleges average distance ranges from 12.6 km in Himachal Pradesh to 29.48 km in Uttrakhand. The average distance for professional institution ranges from15.5 km in Himachal Pradesh to 40.08 kms in Uttrakhand. The results very clearly indicate the reasons for growing literacy among the fisherfolk (Figure 5.8) and thus clearly states that the improved or increased access to educational facilities has helped to increase the literacy level of the fisherfolk. And in spite being longer distance of professional & higher school the fisherfolk are ready to continue their studies.

Table 5. 8: Access to Education (km)

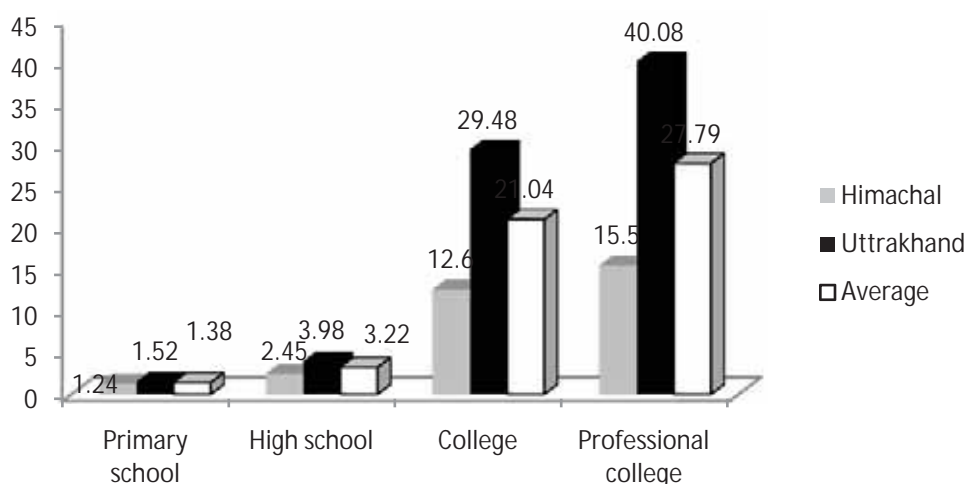| Sl.No.	State	Primary school	High school	College	Professional college
1.	Himachal	1.24	2.45	12.6	15.5
2.	Uttrakhand	1.52	3.98	29.48	40.08
3.	Average	1.38	3.22	21.04	27.79

Figure. 5.8: Access to educational institutions (in km)

C. Health status of respondent households

The average life expectancy of people in the country is worked out to be at 65.5 years ranging from 62.8 years for male to 68.2 years for female. The health status of the respondent households was studied based on the parameters like administration of vaccines, incidence of discontinuation, birth weight of infants, incidence of maternal and child mortality at the time of birth, incidence of common diseases and special ailments among adults and children. Disease management aspects like access to health care, problems in health management and suggestions to improve the health care facilities are also dealt in this session.

(i) Vaccination regime of infants / children (less than 15 years)

The average age of administration of vaccination and incidence of discontinuation among infants/children with age less than 15 years in the selected cold water fisheries states of India is furnished in Table 5. 9 & Figure 5. 9. The vaccination for Pox, BCG, MMR and Polio were taken by all the families covered under the study. The average age at which the vaccination for pox was given to the child is worked out to be 6.2 years ranging from 3.45 years at Himachal Pradesh to 8.9 years at Uttrakhand. The average age at which BCG administered was 0.69 years. The administration of BCG, MMR and other vaccination was not reported in Uttrakhand which reveals the inefficiency of health department to cover these areas.

Table 5.9: Vaccination regime of infants / children (less than 15 years)-
Average age of administration and incidence of discontinuation

Sl. No.	State	Pox		BCG		MMR		Polio		Others	
		Age (years)	IoD (per cent)	Age (years)	IoD (per cent)	Age (years)	IoD (per cent)	Age (years)	IoD (per cent)	Age (years)	IoD (per cent)
1.	Himachal	3.45	10.6	0.69	12.5	1.9	18.3	4.5	12.3	6.2	11.25
2.	Uttrakhand	8.9	24	-	100	-	100	6.8	68	-	100
3 .	Average	6.2	17.3	0.69	56.25	1.9	59.15	5.7	40.15	6.2	55.625
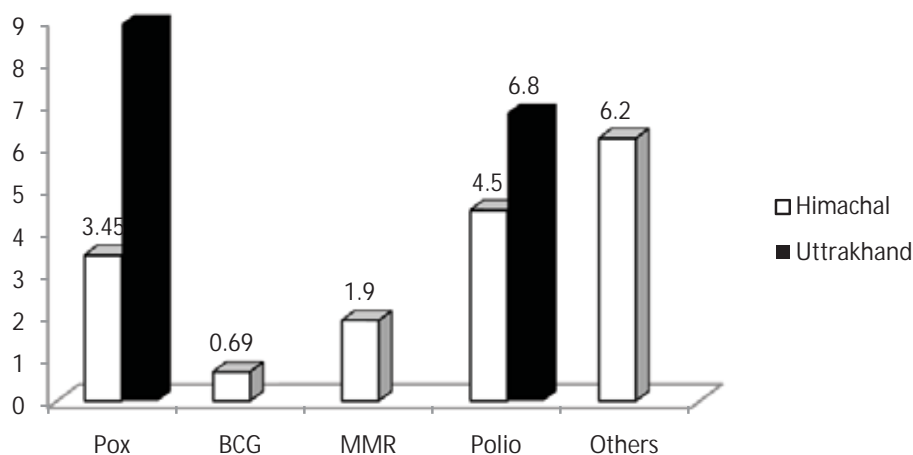
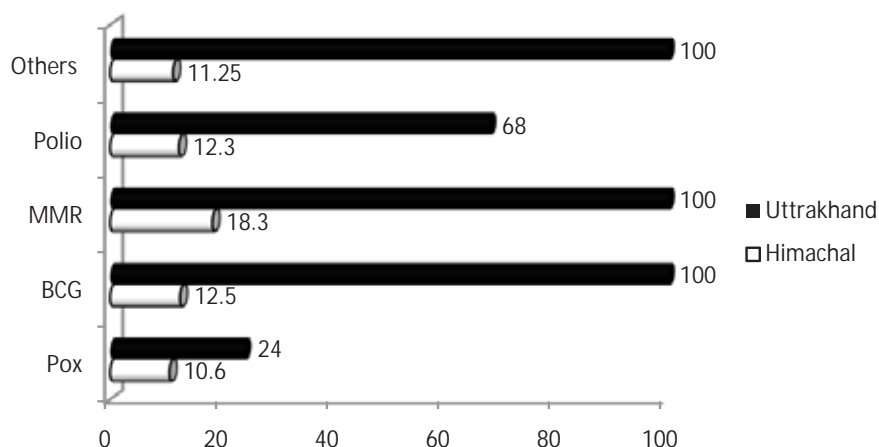Figure: 5. 9. Average age of administration of vaccination

Figure 5.10: Incidence of discontinuation of vaccination in infants (1to 15 yrs)

Incidence of discontinuation was noticed in both states (Figure 5.10). The discontinuation of pox was reported 10.6 per cent in Himachal and 24 per cent in Uttrakhand. The discontinuation of MMR and polio was found to be 18.3 per cent and 12.3 per cent in Himachal Pradesh. These vaccinations were not found administered in the sampled respondent's households in Uttarakhand.

The reasons for the discontinuation vaccination regime of infants are given in Table 5.10 and Figure 5. 11. The lack of sufficient doses of vaccine at the locality, lack of awareness about the availability of vaccines, traditional beliefs and, lack of time to access the vaccination, and poor reliability on vaccines provided by government agencies were listed as the reasons for discontinuation of vaccination in the questionnaire.

Table 5.10: Vaccination regime of infants / children -
Reason for the discontinuation (Frequency)

| Sl. No.	Reasons	State		
		Himachal	Uttrakhand	Total
1.	Traditional beliefs	4 (19.05)	3 (12.00)	7 (15.22)
2.	Lack of awareness about the availability of vaccines	2 (9.52)	4 (16.00)	6 (13.04)
3.	No time to access the vaccination	5 (0.00)	0 (0.00)	5 (10.87)
4.	Lack of sufficient doses of vaccine at the locality	5 (23.81)	15 (60.00)	20 (43.48)
5.	Poor reliability on vaccines provided by government agencies	5 (23.81)	3 (12.00)	8 (17.39)
6.	Total	21 (100.00)	25 (100.00)	46 (100.00)

Figures in parentheses indicate percentage to total
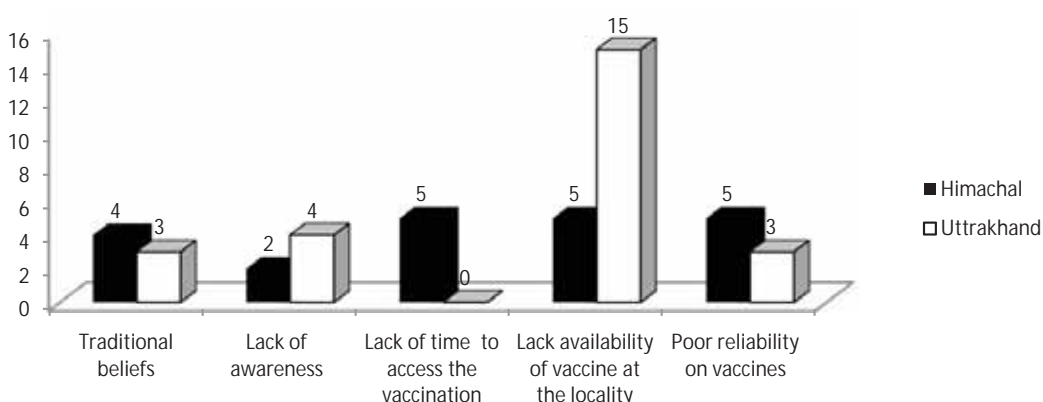
Figure 5.11: Reason for the discontinuation (Frequency)

(ii) Birth weight of infants

The birth weight of infants in fisher households at selected states is given in Table 5.11. The average birth weight of males was 2.76 kg and female was 2.66 kg. The average weight of male infants was recorded 3.01 in Himachal and 2.51 in Uttarakhand and female infants ranges from 2.85 kg in Himachal to 2.47 kg at Uttrakhand. This is in conformity with the average birth weight of a male and female child in India (Census-2001). The graphical representation of the birth weight of the male, female and all infants across the selected states is presented in Figure 5.12.

Table 5.11: Birth weight of infants (kg)

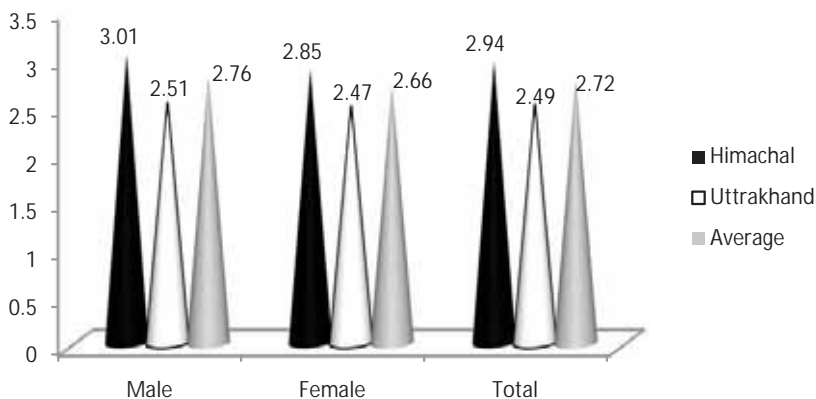| Sl. No.	State	Average Weight		
		Male	Female	Average
1.	Himachal	3.01	2.85	2.94
2.	Uttrakhand	2.51	2.47	2.49
3.	Average	2.76	2.66	2.72

Figure 5. 12: Average Birth weight of infants across various states

(iii) Incidence of mortality among mother/child during birth

The results on the incidence of mortality among mother / child during birth are furnished in Table 5.12. Maternal and child mortality at the time of birth and infant mortality had been pressing concerns over the past. Generally in India, adequate care is being taken now to reduce the incidence of maternal and infant mortality. Out of the 51 delivery cases reported across the study period it was found that there were 2 cases of infant death. The maternal mortality was not reported in any case. But, infant mortality was reported in Himachal Pradesh with 2 case among 36 deliveries. The major reasons cited for the maternal death was due to immature foetal death, complication during delivery, etc.

Table 5.12: Incidence of mortality among mother/child during birth (Number)

Sl. No.	State	Total No. of child/ No of delivery	Mortality of mother/ child during birth				
			Mother	Reason	Child	Reason	Total
1.	Himachal	36	0	0	2	0	2 (5.56)
2.	Uttrakhand	15	0	0	0	0	0.00
3.	Average	51	0	0	2	0	2 (3.92)

Figures in parentheses indicate percentage to total

(iv) Incidence of diseases among adults

The incidence, frequency, and previous occurrence of diseases among the adult family members of the respondents across the selected coldwater states are discussed in the Table 5. 13 (A) and 5.13 (B).

Major diseases found among the respondents were categorized under two groups, viz; common diseases and special ailments. Fever/flu, body ache, diahorrea, gastro enteric disease, skin disorder, reproductive disorder are included in common diseases. Special ailments include diseases like cardiac failure, tuberculosis, anaemia, diabetics, blood pressure, AIDS and others.

In Himachal and Uttarakhand, the average annual frequency of fever was found to be 1.96 and 1.25 for males and 2.5 and 1.27 for females, respectively. Among the family members 41 males and 38 females were affected with fever in Himachal. The second most frequent disease found in the state was body ache followed by diahorrea. The occurrence of diahorrea and skin diseases can be due to the lack of hygienic conditions in the sampled areas. In Uttrakhand, the average annual frequency was recorded 1.25 and 1.27 among males and females respectively for flu/fever. Its incidence was in 24 males and 11 females. Only one case of gastroenteric disease was reported in male with annual frequency of 4 months.

Reported cases of special ailments found among the families of respondents were less across the Himachal and Uttrakhand states. It is quite interesting to note that the respondent households were not affected with life style diseases. There was not even a single member with special ailments or life style diseases like diabetics, blood pressure, and AIDS were seen among the respondent families in the cold water fisheries states of India.

The previous occurrence reported was highest for body ache in case of females of Himachal (3 months) and diahorrea among females of Uttarakhand (4 months.)

Table 5.13(A): Incidence of Diseases among the Adults: Annual frequency

Sl. No.	Diseases	State				
			Himachal		Uttrakhand	
		Particular	Male	Female	Male	Female
	(i) Common diseases					
1.	Fever/Flu	Incidence	1.96	2.5	1.25	1.27
		Number	41	38	24	11
2.	Body aches	Incidence	1.25	2.3	Nil	Nil
		Number	35	34	Nil	Nil
3.	Diahorrea	Incidence	1.1	1.6	1.23	1.44
		Number	33	29	13	9
4.	Gastroenteric disease	Incidence	1.79	1.42	4	Nil
		Number	39	26	1	Nil
5.	Skin disorder	Incidence	0.52	0.69	1	Nil
		Number	25	20	1	Nil
6.	Reproductive disorder	Incidence	Nil	Nil	Nil	Nil
	(ii) Special ailments					
7.	Cardiac failure	Incidence	Nil	Nil		Nil
		Number	Nil	Nil		Nil
8.	TB	Incidence	Nil	Nil		Nil
		Number	Nil	Nil	1	Nil
9.	Anaemia	Incidence	Nil	Nil	2	Nil
10.	Diabetes	Number	Nil	Nil		Nil
		Incidence	Nil	Nil		Nil
11.	Blood pressure	Number	1	1		Nil
		Incidence	18	12		Nil
12.	AIDS	Number	Nil	Nil		Nil

Table 5.13 (B): Incidence of disease among adults: Previous occurrence

SI. No.	Diseases	State			
		Himachal		Uttrakhand	
		Male	Female	Male	Female
	(i) Common diseases				
1.	Fever/Flu	2.45	2.89	2.19	1.70
2.	Body aches	2.25	3.00	1.95	2.40
3.	Diahorrea	1.60	1.80	2.70	4.00
4.	Gastroenteric disease	0.56	0.50	2.25	Nil
5.	Skin disorder	1.50	0.75	8.00	Nil
6.	Reproductive disorder	Nil	Nil	Nil	Nil
	(ii) Special ailments				
7.	Cardiac failure	Nil	Nil	Nil	Nil
8.	TB	Nil	Nil	6.00	Nil
9.	Anaemia	Nil	Nil	Nil	Nil
10.	Diabetes	Nil	Nil	Nil	Nil
11.	Blood pressure	1.50	2.00	Nil	Nil
12.	AIDS	Nil	Nil	Nil	Nil
13.	Others* (Infertility)	Nil	Nil	Nil	Nil

(v) Incidence of diseases among children

Among children, the most frequently occurred disease is fever, body ache, diahorrea, gastroenteric disease and skin disorder (Table 5. 14 A & 5.14B). In Himachal Pradesh, the annual frequency of fever was reported at 2.5 in males and 2.12 in females. The incidence of body ache was seen 13 in male and 12 in female with an annual frequency of 2.8 and 2.01 respectively. The incidence of diahorrea was observed 10 in male and 11 in female at an annual frequency of 2.4 and 2 respectively.

In Uttrakhand, the incidence of fever flu, body ache and diahorrea was observed sparse. The annual frequency of body ache was 2.5 and 3.1 in male and female, respectively. The cases of diahorrera was highest among males at 3.6. No cases of special ailments were reported in Himachal Pradesh and Uttrakhand.

Table 5.14 (A): Incidence of disease among children: Annual Frequency

SI. No.	Diseases	State				
			Himachal		Uttrakhand	
		Particular	Male	Female	Male	Female
	(i) Common diseases					
1.	Fever/Flu	Incidence	2.50	2.12	2.20	1.94
		Number	12	10	10	13
2.	Body aches	Incidence	2.80	2.01	2.50	3.10
		Number	13	12	2	5
3.	Diahorrea	Incidence	2.40	2.00	3.60	2.68
		Number	11	10	14	8
4.	Gastroenteric disease	Incidence	1.80	1.40	Nil	Nil
		Number	10	9	Nil	Nil
5.	Skin disorder	Incidence	1.20	1.89	Nil	Nil
		Number	11	14	Nil	Nil
6.	Reproductive disorder	Incidence	Nil	Nil	Nil	Nil
	(ii) Special ailments					
7.	Cardiac failure	Incidence	Nil	Nil	Nil	Nil
8.	TB	Incidence	Nil	Nil	Nil	Nil
9.	Anaemia	Incidence	Nil	Nil	Nil	Nil
10.	Diabetes	Incidence	Nil	Nil	Nil	Nil
11.	Blood Pressure	Incidence	Nil	Nil	Nil	Nil
12.	AIDS	Incidence	Nil	Nil	Nil	Nil

Table 5.14 (B) Incidence of disease among children: Previous occurrence

SI. No.	Diseases	State			
		Himachal		Uttrakhand	
		Male	Female	Male	Female
	(i) Common diseases				
1.	Fever/Flu	2.11	1.28	3.25	2.95
2.	Body aches	1.25	1.24	2.60	2.40
3.	Diahorrea	1.53	2.15	1.40	1.65
4.	Gastroenteric disease	2.21	0.81	Nil	Nil
5.	Skin disorder	1.40	1.21	Nil	Nil
6.	Reproductive disorder	Nil	Nil	Nil	Nil

(vi) Access to health care

The access to health care is also an important parameter which determines the continued health of the fisherfolk. Often the distance leads to the non treatment or its delay. The access to health care was measured using the distance required to avail the same (Table 5.15 and Figure 5.13) The results indicate that there exists considerable access to the primary health centre and hospital. On an average the primary health centre was available at a distance of 8.21 km and the hospital at 15.24 km. The average distances for the primary health centre is 7.25 km in Himachal Pradesh and 9.37 km in Uttarakhand and for hospital it is 14.52 km in Himachal Pradesh to 146km in Uttrakhand.

Table 5. 15: Access to health care (km)

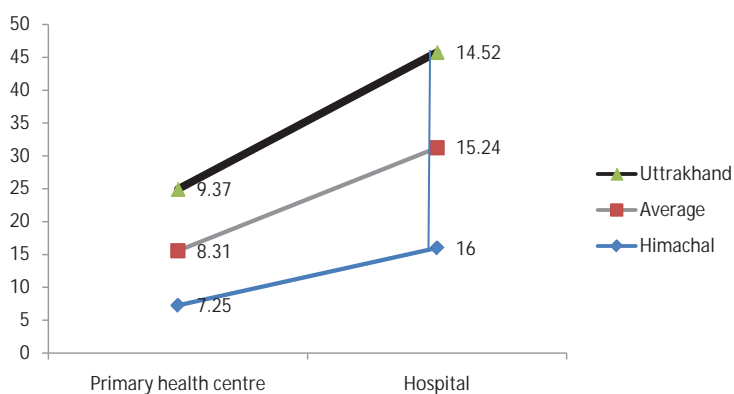| S.No	State	Primary health centre	Hospital
1.	Himachal	7.25	16
2.	Uttrakhand	9.37	14.52
3.	Average	8.31	15.24

Figure 5.13 Access to Health care (km)

(vii) Problems in health management

The major problems underwent in health management was analyzed based on the opinion of the sample respondents. The major reasons cited by the respondents are indicated in Table 5.16 and Figure 5. 14. The state level analysis of the sample respondent households indicated that the non availability of ambulances & first aid facilities was the major problem perceived in Himachal Pradesh (20.31 per cent) & Uttrakhand (10.47 per cent). Availability of less number of doctors (specialists) and paramedics in the health care centres was cited by 14.06 per cent of people in Himachal and 11.63 per cent of people in Uttrakhand. Also, 17.44 per cent of people in Uttrakhand complained about the long distance of the health care facility. Over all the maximum responses were for non-availability of ambulance and first aid facilities (16.35 per cent) and availability of less number of doctors (specialists) and paramedics in the health care centres (15.89 per cent) in the selected coldwater states.

Table 5.16: Problems in health management (Frequency)

| Sl. No.	Problems	State		
		Himachal	Uttra-khand	Total
1.	Non-availability of ambulance and first aid facilities	26 (20.31)	9 (10.47)	35 (16.35)
2.	Poor drinking water, sanitation, drainage, waste disposal and infrastructure in the village	18 (14.06)	10 (11.63)	28 (13.08)
3.	Availability of less number of doctors (specialists) and paramedics in the health care centres	18 (14.06)	16 (18.60)	34 (15.89)
4.	Doctors availability at fixed timings in the days	15 (11.72)	6 (6.98)	21 (9.81)
5.	Non- availability of medicines and/or less effective and costlier medicines in private medical shops	10 (7.81)	12 (13.95)	22 (10.28)
6.	Poor /less awareness of maternal and child care	16 (12.50)	8 (9.30)	24 (11.22)
7.	Lack of modern and bed facilities	15 (11.72)	10 (11.63)	25 (11.68)
8.	Long distance of the health care facility	10 (7.81)	15 (17.44)	25 (11.68)
9.	Total	128 (100.00)	86 (100.00)	214 (100.00)

Figures in parentheses indicate percentage to total
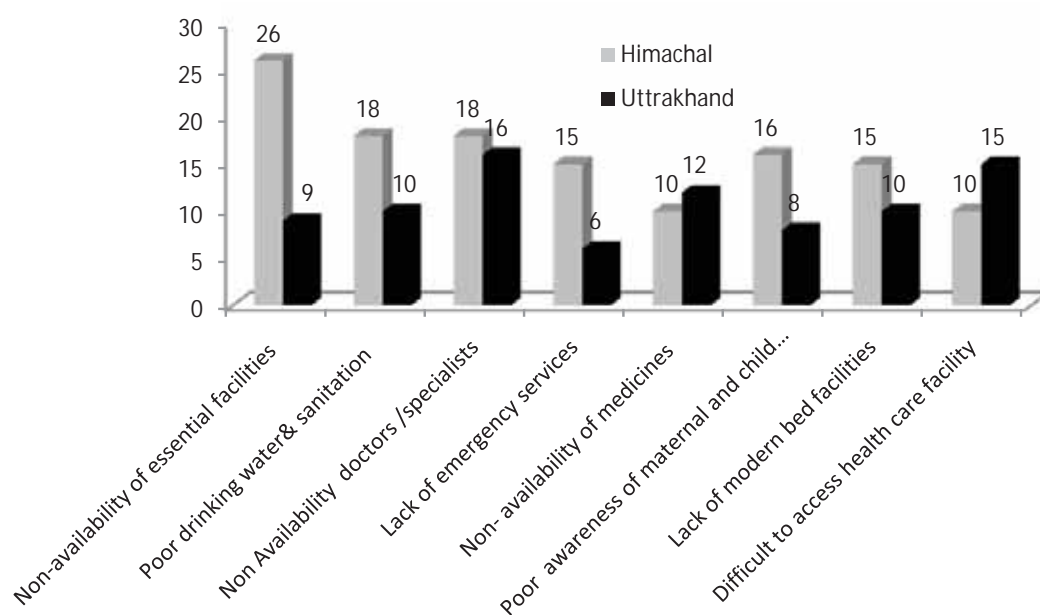
Figure :5. 14 Problems in health management (frequency)

(vii) Suggestions to improve healthcare facilities

The respondent households opined on the different suggestions for improving the health care facilities and the details are furnished in Table 5.17. The major suggestions cited by the respondents included increasing the number of doctors/specialists, construction of quarters facility for doctors so that they are available 24 x7, providing available sufficient medicines for all diseases with free of cost, construction of the modern hospital with all infrastructure and healthcare facilities, provision of ambulance for emergency (especially during delivery accidents, etc.) and providing good drinking water facility (Figure 5.15).

It was found that the most important suggestion which was opined by the respondent across the states was providing quarters facility for doctors so that they are available 24 x 7 (27.18 per cent in Himachal & 16.67 per cent in Uttrakhand.) followed by provisions for making sufficient medicines for targeted group (17.07 per cent), to construct the modern hospital with all infrastructure and health care facilities (15.12 per cent) and to have precautionary health awareness viz., accessing good drinking water, sanitation and waste disposal both at home and village (14.15 per cent)

Table 5.17: Suggestions to improve health care facilities (Frequency)

Sl. No.	Suggestions	State		
		Himachal	Uttra-khand	Total
1.	Make quarters facility for doctors so that they are available 24 x 7	28 (27.18)	17 (16.67)	45 (21.95)
2.	Make available sufficient medicines for targeted disease	15 (14.56)	20 (19.61)	35 (17.07)
3.	Make available of medicines with free of cost	14 (13.59)	10 (9.80)	24 (11.71)
4.	Construct the modern hospital with all infrastructure and health care facilities	12 (11.65)	19 (18.63)	31 (15.12)
5.	Provide ambulance for emergency (especially during delivery, accidents etc.)	8 (7.77)	12 (11.76)	20 (9.76)
6.	Increase the number of doctors / specialist	12 (11.65)	9 (8.82)	21 (10.24)
7.	Precautionary health awareness (Accessing good drinking water, sanitation and waste disposal - both home and village)	14 (13.59)	15 (14.71)	29 (14.15)
8.	Total	103 (100.00	102 (100.00	205 100

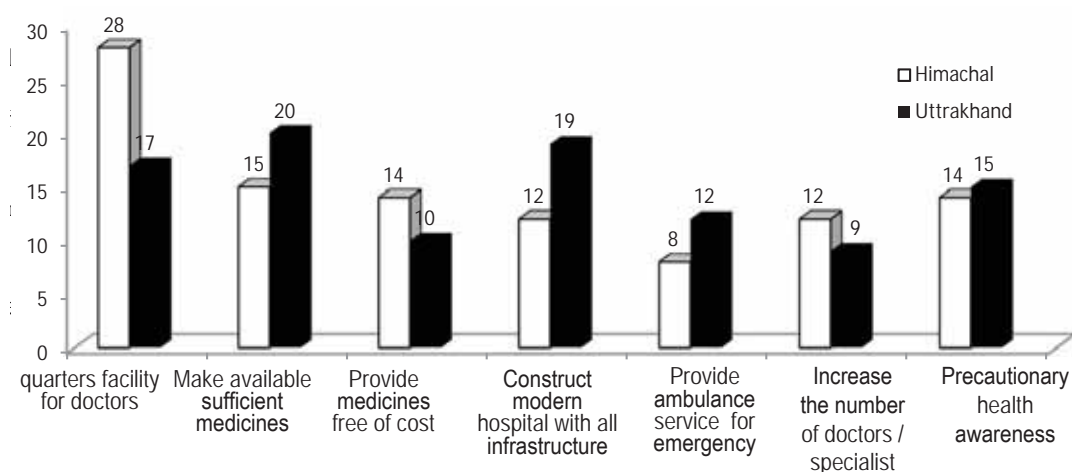*Figures in parentheses indicate percentage to total*

Fig 5.15: Suggestions to improve health care facilities (Frequency)

D. Income status of respondent households

The income profiling of the respondent households were analyzed using income patterns, respondents involvement in non fisheries activities and expenditure pattern. In addition the indebtedness and savings were analyzed using details on savings, indebtedness, sources of lending organization, purpose of availing loan and suggestions for enhancing the income and employment generation.

(i) Monthly income pattern of respondent households

The major income sources of the respondent households comprised of income from fishery, business, agriculture, labour services, and other service sectors. The highest monthly average income generated by the total respondents across the states was through fisheries sector. The state wise monthly income status of the respondents indicated in Table 5.18. It shows that Uttrakhand has the highest income from fisheries sector which contributed to 52.40 per cent of the total income.

In Himachal, the income from fisheries sector contributed to 42.57 per cent of the income followed by the labour sector contribution at 23.16 per cent. Also the total income was higher in Uttrakhand (Rs. 4958) as compared to Himachal Pradesh (Rs. 3277)

Table 5.18: Income profile of the respondents (Monthly Rs.)

Sl. No.	State	State					
		Fishery	Labour	Agriculture	Business	Other	Total
1.	Himachal	1395 (42.57)	759 (23.16)	425 (12.97)	440 (13.43)	258 (7.87)	3277 (100.00)
2.	Uttrakhand	2598 (52.40)	1020 (20.57)	1200 (24.20)	70 (1.41)	70 (1.41)	4958 (100.00)
3.	Average	1996.50 (48.49)	889.50 (21.60)	812.50 (19.73)	255.00 (6.19)	164.00 (3.98)	4117.50 (100.00)

(ii) Involvement in non fisheries activities

The Involvement of respondent' households in non fisheries activities are illustrated in the Table 5.19 and Figure 5.16.

The major non fishing activities involved by respondents were labour, agriculture, business, and other service sectors with a contribution of 41.79, 38.81, 8.96 and 10.45 per cent respectively. The total number of respondents involved in labour was highest in Uttrakhand with 42.86 per cent. In Himachal Pradesh, 40.00 per cent of the respondents involved in labour activities which might be due to non availability of land in the state. The result clearly indicated the existence and practice of alternative avocation in the selected respondent households.

Table 5.19 Respondents involvement in non-fisheries activities (Number)

SI. No.	State	State				
		Labour	Agriculture	Business	Any others	Total
1.	Himachal	10 (40.00)	5 (20.00)	4 (16.00)	6 (24.00)	25 (100.00)
2.	Uttrakhand	18 (42.86)	21 (50.00)	2 (4.76)	1 (2.38)	42 (100.00)
3.	Total	28 (41.79)	26 (38.81)	6 (8.96)	7 (10.45)	67 (100.00)

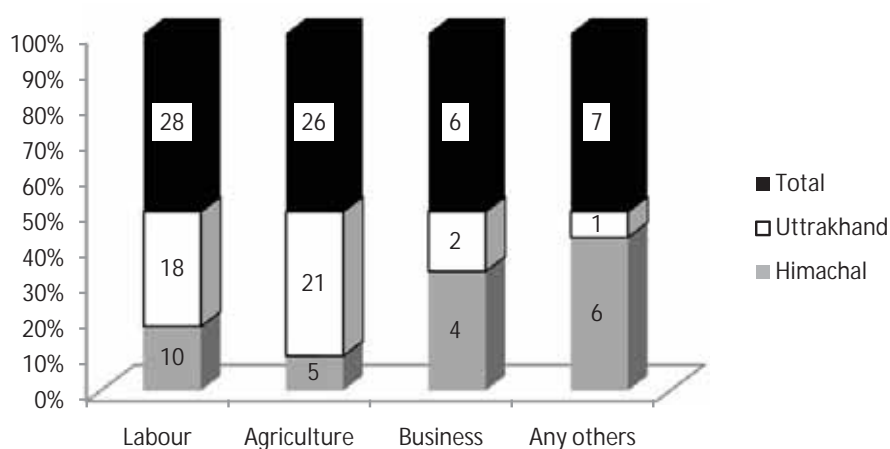*Figures in parentheses indicate percentage to total*

Figure: 5.16 Respondents involvement in non-fisheries activities (frequency)

(iii) Pattern of expenditure

The major household expenses measured include expenditure on food, clothing, fuel, medical, education, entertainment, personals and durables. The pattern of monthly expenditure of respondent household is represented in Table 5.20 and Fig 5.17. The average monthly expenditure pattern of the households worked out at Rs. 3469.00, comprises of Rs 886.00 on food, Rs 732.5 on education, Rs 454.5 on cloth, and Rs 413.50 on medical. The least

expenditure was Rs.107.00 on entertainment. The highest household expenditure was noticed in Uttrakhand with an average amount of Rs. 4425.00. Here people spend more money on education (25.76 per cent) than food (18.76 per cent).

In Himachal Pradesh fisher folks spent more on food with an average amount of Rs. 942 (37.49 per cent) and least is spend on entertainment (4.93 per cent).

Table 5.20: Pattern of expenditure of the fisher family (Monthly)

| Sl. No.	State	Expenditure on Items								
		Food	Cloth-ing	Fuel	Medical	Edu-ca-tion	Enter-tain-ment	Per-sonal	Dura-bles	Total
1.	Himachal	942 (37.49)	289 (11.50)	64 (2.55)	242 (9.63)	325 (12.93)	124 (4.93)	246 (9.79)	281 (11.18)	2513 (100.00)
2.	Uttrakhand	830 (18.76)	620 (14.01)	470 (10.62)	585 (13.22)	1140 (25.76)	90 (2.03)	680 (15.37)	10 (0.23)	4425.00 (100.00)
3.	Average	886.00 (25.54)	454.50 (13.10)	267.00 (7.70)	413.50 (11.92)	732.50 (21.12)	107.00 (3.08)	463.00 (13.35)	145.50 (4.19)	3469.00 (100.00)

Figures in parentheses indicate percentage to total
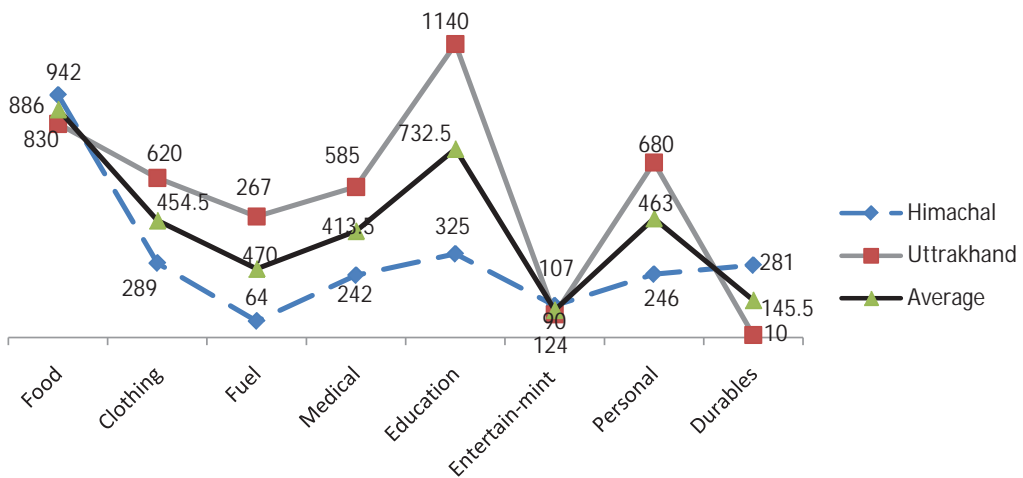
Figure 5.17: Pattern of expenditure of the fisher family

(iv) Indebtedness and Savings

The indebtedness and savings of the respondent households are indicated in Table 5.21. The saving details of the respondent's households across the states indicated that around 44 per cent of the respondents have no savings. It was found that the frequency of respondents possessing savings varied across the states with 16 per cent in Himachal Pradesh and 96 per cent in Uttrakhand. No respondents in the sampled population have a saving of more than Rs 50000.

Table 5.21: Savings details of respondent households

Sl. No.	State	Number of respondents having savings				Total
		Nil	< 50,000	50,000-1,00,000	>1,00,000	
1.	Himachal	21	4	0	0	25
		(84.00)	(16.00)	(0.00)	(0.00)	(100.00)
2.	Uttrakhand	1	24	0	0	25
		(4.00)	(96.00)	(0.00)	(0.00)	(100.00)
3.	Total	22	28	0	0	50
		(44.00)	(56.00)	(0.00)	(0.00)	(100.00)

Figures in parentheses indicate percentage to total

(v) Indebtedness of the respondents' households

The lack of savings and the need for increased expenditure for mere sustenance often lead to indebtedness. The pattern of indebtedness of respondent households across the 2 states of cold water fisheries in India is discussed in Table 5.22. The highest average amount of indebtedness was recorded in Himachal Pradesh with Rs. 35946 per person. The average amount repaid was Rs. 14269 accounted for 39.70 per cent of the loan amount. In Uttrakhand none of the person was in indebtedness.

Table 5.22. Indebtedness of the sample respondents

Sl. No.	State	Indebtedness			
		Number of persons Borrowed	Average Amount per person (Rs)	Average Amount repaid (Rs)	Per cent repayment
1.	Himachal	15	35946	14269	39.70
2.	Uttrakhand	Nil	Nil	Nil	Nil

(vi) Sources of lending

The indebtedness often results in availing loans from the different institutions. The major sources of lending include banks, co-operatives, private money lenders, friends/relatives and jewel loans. The details of the sources of money lending by the respondent households is furnished in Table 5. 23. It was found that nobody from Uttrakhand was in indebtedness, where as in Himachal Pradesh, a total of 15 respondents had availed loans for various purposes. It was found that private money lenders constituted the major source of lending organizations for 53.33 per cent of the respondent household. Banks provided credit to 2 respondents and constituted 13.33 per cent of the sample respondents. Cooperatives were a good source of lending through which 33.33 per cent of the respondents availed loan.

(vii) Purpose of availing loans

The respondents of the Himachal Pradesh availed loans for both fishing and personal purposes. The maximum share of (53.33 per cent) the respondents availed loans for fisheries, followed by consumption purpose ie. food, health, education and marriage (26.67 per cent)

Table 5.23: Sources of lending (Number of respondents who had availed)

Sl. No.	Sources	State	
		Himachal	Uttrakhand
1.	Banks	2 (13.33)	Nil
2.	Co-operative	5 (33.33)	Nil
3.	Private money lenders	8 (53.33)	Nil
4.	Friends / Relatives	0 (0.00)	Nil
5.	Jewel loans	0 (0.00)	Nil
6.	Total	15 (100.00)	Nil

Figures in parentheses indicate percentage to total

(Table 5. 24). 13.33 per cent of the respondents availed loan for purchasing land/house and another 6.67 per cent were availed loan for agriculture.

Table. 5.24. Purpose of availing loans (Number)

S. No.	Activity	State	
		Himachal	Uttrakhand
1.	Agriculture	1 (6.67)	Nil
2.	Fisheries	8 (53.33)	Nil
3.	Purchasing land/house	2 (13.33)	Nil
4.	Consumption Food, health, Education and Marriage)	4 (26.67)	Nil
5.	Total	15 (100.00)	Nil

Figures in parentheses indicate percentage to total

(viii) Suggestions for enhancing the income and employment generation by fishermen

Arranging institutional credit through micro finance and SHGs should be given priority according to 27.40 per cent of fishers (Table 5.25 & Figure 5.18).Other major options suggested include providing vocational training for fisher women to undertake house hold income activities during dry/off season (19.18 per cent), arrange water source/ground water facilities for conducting the fisheries around the year (17.81 per cent), regulation of fish marketing through institutional interventions (12.33), and provision of rural infrastructure for general societal/human development (9.59 per cent).

Table. 5.25. Suggestions for enhancing the income and employment generation by fishermen (percentage response)

Sl. No.	Suggestions	State		Total
		Himachal	Uttrakhand	
1.	Arranging the institutional financial support like micro credit for fisheries, SHGs etc.	8 (25.81)	12 (28.57)	20 (27.40)
2.	Vocational training for fisher women to undertake household income activities during dry/off-season	6 (19.35)	8 (19.05)	14 (19.18)
3.	Arrange the water source/ground water for conducting the fisheries around the year	4 (12.90)	9 (21.43)	13 (17.81)
4.	Provision of rural infrastructure for general societal/ human development	2 (6.45)	5 (11.90)	7 (9.59)
5.	Regulation of fish marketing through institutional interventions	5 (16.13)	4 (9.52)	9 (12.33)
6.	Regulation of PDS and supply of the basic food items and fuel (like kerosene, LPG etc.) by the Govt. agencies	4 (12.90)	3 (7.14)	7 (9.59)
7.	Provide the home construction materials by government through subsidized price	2 -	1 (2.38)	3 (4.11)
8.	Total	31 (100.00)	42 (100.00)	73 100.00)

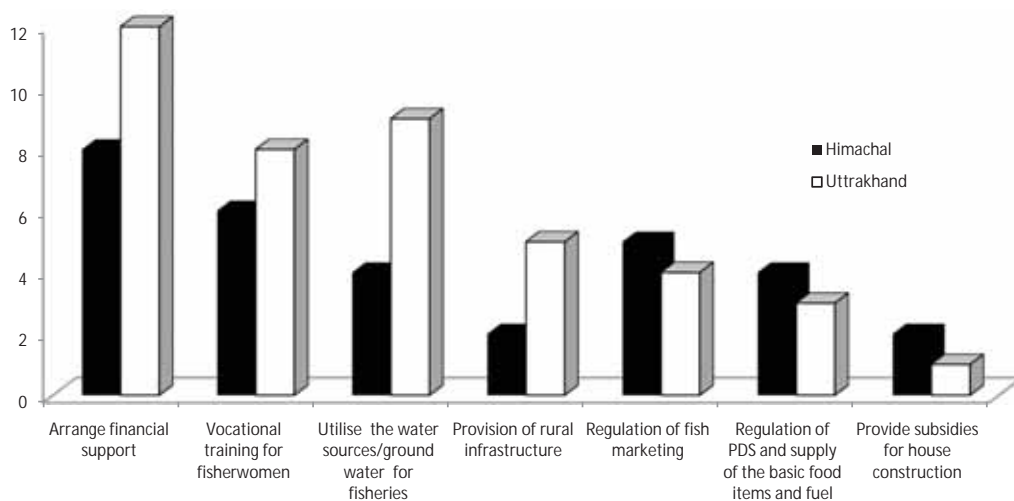*Figures in parentheses indicate percentage to total*

Figure 5.18 : Suggestions for enhancing the income and employment generation