

Chapter Four

EMPERICAL RESULTS AND ANALYSIS

This chapter presents the empirical findings of the study. It is divided into four sub-themes, namely, profile of the sample households (section 4.1), poverty, inequality and human development (section 4.2) and econometric analysis of poverty (section 4.3).

The section on profile of sample households consists of six sub-sections (4.1.1 – 4.1.6), dealing respectively with demographic characteristics, educational profile, housing profiles, expenditure profile, occupational status and finally profile of the sampled villages of Sivasagar and Dhemaji districts of Assam.

The section on poverty, inequality and human development has been divided into six sub-sections (4.2.1 - 4.2.6) related to absolute poverty, relative poverty, Poverty and Inequality across and within different occupations, decomposition of the Gini Index by sources of consumption expenditure, Household Level Human Development Index (HHDI), Inequality-adjusted HHDI, and association between HHDI and Multi-dimensional Poverty Index (MPI).

The third section (econometric analysis of poverty) consists of two sub-sections (4.3.1 - 4.3.2) dealing with results of Ordinary Least Squares and Logit models.

4.1 Profile of Sample Households

A household refers to a group of persons living together and taking food from a common kitchen. It excludes temporary visitors or guests (total period of stay expected to be less than 6 months), but includes temporary stay-aways (expected total period of absence less than 6 months) (NSSO, 2014:8-9). The household is the final statistical unit of data collection, measurement and analysis for the present study. The development status of a tribe or ethnic group is understood by the quality of life enjoyed by the constituent households of that tribe or ethnic group residing at

a particular location at a particular point in time. If the ultimate objective of a sound socio-economic study is to unveil the real development status of a certain group of people; then, the final statistical unit of observation, data collection and measurement must ultimately be the household. Macro-level data or aggregative data on tribes or ethnic groups residing in different regions fail to deliver detailed information that could be helpful in well targeted policy interventions.³⁷ Of course, Micro-level information, especially unit level information is hard to find in secondary sources.

Thus minute and detailed observations about a tribe or group of people can only be found by actually surveying the household. By profile the present study implies socio-economic profile of the sample Mishing households.

4.1.1 Demographic Characteristics

Demographic characteristics, such as household size, age structure/composition, dependency ratio, sex ratio, gender of head etc, are the prime determinant factors influencing the socio-economic status of both the rural and urban Mishing households.

Age Distribution of the Head of Household

Age is one of the key factors that determine physical fitness, attitude towards risk and uncertainty, experience, and the capacity (or capability) to work. Results (Table 4.1.1) reveal that the average age of the head of the households in Sivasagar district is 49.73 ± 0.99 years, while that in Dhemaji district is 48.14 ± 1.00 years. This implies that majority of household heads are middle aged people.

³⁷ A little elaboration and clarification may be required to justify this point. For example, a secondary data source may tell us that sufficient (in relation to village population) the numbers of deep tube-wells have been installed in a particular village. Thus the population of the village would obviously be by convention classified as population under safe drinking water scheme. But this may hardly be the ground reality. There may be numerous households within the village which may be drawing and using water from sources other than the installed tube wells. This may be due to locational disadvantage, social discrimination, false and faulty beliefs of certain communities, among numerous other reasons. Thus finally, a village level household survey might reveal that only a small fraction of village population is actually under safe drinking water scheme.

District	Total Number (N)	Maximum	Minimum	Mean	Standard Deviation(SD)
Sivasagar	192	85.00	26.00	49.73	0.99
Dhemaji	181	80.00	24.00	48.14	1.00
Overall	373	85.00	24.00	48.94	0.995

Source: Computed on the basis of primary data collected during field survey

Age Composition or Structure of the Members of the Households

Age-wise composition of the members of the households provides us the information about the working class and dependant class people in a community. For this purpose, the members of the households are divided into three age-groups: i) Age < 0-14 years; ii) 15 years ≤ Age ≤ 64 years; and Age ≥ 65 years. The table 4.1.2 reveals that the overall proportion of working class people (15-64 years) is higher (64.78) than the children (0-14 years) and retired or old-age people (65 years above). This figure is higher in Sivasagar district (66.34 per cent) as compared to Dhemaji district (63.25per cent).

District	Age Distribution of the Households			Total
	0-14 years	15-64 years	65 years and above	
Sivasagar	331 (29.79)	737 (66.34)	43 (3.87)	1111 (100)
Dhemaji	354 (31.58)	709 (63.25)	58 (5.17)	1121 (100)
Overall	685 (30.69)	1446 (64.78)	101 (4.53)	2232 (100)

Note: Figures in the parentheses indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

	Sex	Age Groups (years)				
		0 - 4	10 - 14	0 - 14	15 - 59	60+
India	Total	10.0	10.2	29.8	61.9	8.3
	Male	10.3	10.4	30.4	61.7	7.9
	Female	9.8	10.0	29.1	62.1	8.8
Assam	Total	10.6	31.0	32.3	62.9	6.1
	Male	10.9	31.4	32.5	62.5	6.1
	Female	10.3	30.5	32.2	63.4	6.0

Source: Government of India, 2013b: 12-20

In rural India, percentage of population in the age group 0-14 years to total population turns out to be 29.8 and that in the working age group 15-59 years is 61.9 per cent. Percentage of population in the age group 60 years and above to total population is 8.3. Similarly, in rural Assam, total 32.3 percentage of the total population was of 0-14 years age group, where 6.1 percentage of total population was of 60 years and over age group in rural Assam. The remaining 62.9 percentage was confined to 15-59 year's age group (Government of India, 2013b:12-20). It is found that percentage of population in the age group 15-59 years is higher among the Mishing tribe in both the district as compared to entire India or Assam.

Dependency Ratio

(Age or total) Dependency ratio³⁸ is the ratio of persons in the “dependent” ages (generally under age 15 and over age 64) to those in the “economically productive” or “working” ages (15-64 years) in the population. Data are shown as the proportion of dependents per 100 working-age population.

$$\text{(Total) Dependency ratio} = \frac{(\text{Number of persons aged 0-14 and those aged 65 and over})}{(\text{Number of persons aged 15-64})} \times 100$$

The (total) dependency ratio can be decomposed into the child dependency ratio (ratio of persons under 15 to those aged 15-64 years) and the aged or old age dependency ratio (the ratio of persons aged 65 and older to those aged 15-64 years):

$$\text{Child dependency ratio} = \frac{\text{Number of persons aged 0-14}}{\text{number of persons aged 15-64}} \times 100$$

$$\text{Aged dependency ratio} = \frac{\text{Number of persons aged 65 and over}}{\text{Number of persons aged 15-64}} \times 100$$

In the table 4.1.2 it is evident that the (total) dependency ratio among the Mishing tribe in Sivasagar district is 50.75 (44.91 per cent in age group of below 15 years plus 5.83 per cent in age group of 65 years or more). The corresponding figures is 58.11(49.92 per cent in age group of below 15 years plus 8.81 per cent in

³⁸It is just a ratio of net consumers to net producers. This indicator suffers from certain limitation. It was found in field study that some persons aged 15-64 are not economically active and some persons are economically active or do not stop working even after 65 age. In particular cases, theoretically, the older persons aged 65 and over are confined to dependent group, but practically they support economically the unemployed or underemployed persons of working group inside the household. Now days, many persons continue to study and build their career upto 30-35 age well extending the young-age dependency period beyond age 15.

age group of 65 years or above) in Dhemaji district. The child dependency ratio and the aged or old age dependency ratio are higher (49.92 per cent > 44.91 per cent and 8.81 per cent > 5.83 per cent respectively) in Dhemaji as compared to Sivasagar district. According to 2011 census the (total) dependency ratio, child dependency ratio and old age dependency ratios in India are 652, 510 and 142 per thousand respectively in 2011. The total dependency ratio, child dependency ratio and old age dependency ratios in both districts are estimated to be lower than the all India levels. Reduction in dependency ratio indicates a transition where a higher percentage of persons in the working age group transfers or moves into higher per capita income. It is because of higher percentage (66.34 per cent in Sivasagar and 63.25 per cent in Dhemaji) of persons in age-group 15-59 years. It can be termed as the benefit of “Demographic Dividend.”

Household Size

The size of a household is the total number of persons or members within the household. It influences and affects the socio-economic conditions of a family. It is hypothesized that small household sizes have positive and favorable effect and large size of the households have negative and un-favorable effect on socio-economic conditions of the family members primarily because per capita resources enjoyed falls with rising household size or family size.

Results (Table 4.1.4) reveal that the household sizes of the Mishing tribe in Sivasagar and Dhemaji district are 5.79 ± 0.16 and 6.19 ± 0.16 members respectively. It is observed that mean household size of the Mishing tribe in Sivasagar district (5.79) is higher than the mean household size of overall Sivasagar district (4.7) and all over Assam (4.9) as per Census 2011. Similarly, mean household size of the Mishing tribe in Dhemaji district is estimated at 6.19 which is higher than the mean household size of overall Dhemaji district (5.3) and entire Assam (4.9) as per Census 2011. Maximum and minimum sizes of households are 15 and 2 in both the districts.

District	Total Number (N)	Maximum	Minimum	Mean	Standard Deviation (SD)
Sivasagar	192	15.00	2.00	5.79	0.16
Dhemaji	181	15.00	2.00	6.19	0.16
Overall	373	15.00	2.00	5.99	0.16

Source: Computed on the basis of primary data collected during field survey

It is observed from table 4.1.5 that single or two member households are rare in Sivasagar (0.52 per cent) and Dhemaji (1.11 per cent). In Sivasagar district, 23.44 per cent households have 5 members; whereas, 8.33 and 22.92 percent households have 3 and 4 members, respectively. Similarly, in Dhemaji district, 25.97 per cent households have 6 members; however, 3.87, 16.02 and 17.68 per cent have 3, 4 and 5 members respectively. In Sivasagar district, 44.79 per cent (i.e. 15.1+10.94+6.77+11.98 per cent) of all households comprising of 6 or more members, whereas that ratio is 61 per cent (i.e. 25.97+13.81+8.84+12.71 per cent) among non-poor households.

District	Household Members								Total
	2	3	4	5	6	7	8	≥ 9	
Sivasagar	1 (0.52)	16 (8.33)	44 (22.92)	45 (23.44)	29 (15.1)	21 (10.94)	13 (6.77)	23 (11.98)	192 (100)
Dhemaji	2 (1.11)	7 (3.87)	29 (16.02)	32 (17.68)	47 (25.97)	25 (13.81)	16 (8.84)	23 (12.71)	181 (100)
Overall	3 (0.80)	23 (6.17)	73 (19.57)	77 (20.64)	76 (20.38)	46 (12.33)	29 (7.77)	46 (12.33)	373 (100)

Note: Figures in the parentheses indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

Sex Ratio

‘sex’ is used to refer the biological difference between men and women, while ‘Gender’ refers to cultural, socially-constructed differences between the two sexes (men and women). The sex composition figures across the two districts are presented in table 4.1.6. Total 192 Mishing households are selected for the study from Sivasagar district while the figure is 181 for Dhemaji district. The total size of all members of all sample households in Sivasagar is 1111, while the corresponding figure for Dhemaji is 1121. In other words 192 sample household in Sivasagar

comprise of 1111 members in all. Similarly 181 sample households of Dhemaji district comprise of 1121 members altogether. Percentage of male members in the Sivasagar sample turns out to be 50.77 while the percentage of females is just 49.23. These figures in Dhemaji turn out to be almost same. This is a most expected and desirable.

District	Male	Female	Total
Sivasagar	564 (50.77)	547 (49.23)	1111 (100)
Dhemaji	570 (50.85)	551 (49.15)	1121 (100)
Overall	1134 (50.81)	1098 (49.19)	2232 (100)

Note: Figures in the parentheses indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

The sex-ratio is considered as an important indicator of poverty. The sex ratio is the ratio of females to males in the population (normalized to 1000). Two sex-ratios are important at birth, and in the total population. Sex ratio at birth implies girls aged (0-6 years) per thousand boys in the same age group.

Sex Ratio in Assam was 954 per 1000 males which were above the national average of 943 as per census 2011. In rural Assam, (total) sex ratio was 960 per 1000 males while same for the child was 964 girls per 1000 boys in 2011. In Assam, child population forms 15.62 percent of total rural population, whereas, population in the age group 0-6 years was 13.6 percentage of total population at the all India level (Government of India, 2011). As per 2011 census, sex ratio among the Mishing tribe stood at 968. The figures in terms of the conventional sex ratio of number of females per thousand males, the sex ratio for Sivasagar turns out to be 970 per 1000 males and that in Dhemaji stands at 967 per 1000 males. It is found that sex ratio in both the districts is higher as compared to entire Assam as well India.

	2001 [#]	2011 [#]	Mishing Tribe*
India	933	943	-
Assam	935	954	-
Sivasagar	928	954	970
Dhemaji	941	953	967

Sources: # Census of India (2001, 2011) *Computed on the basis of primary data collected during field survey

Type of Family

The dichotomy of family as nuclear family and joint family is based on the mode of family organisation. The nuclear family is used to define as a group consisting of spouses and their unmarried children; while, the joint family refers to a group of a nuclear family along with all the kin belonging to either side of the spouses living under one roof. To Irawati Karve (1990:10), "A joint family³⁹ is a group of people who generally live under one roof, who eat food cooked at common hearth, who hold property in common and who participate in common worship and are related to each other as some particular type of kindred."

Out of the total sample households (373) in the two districts, the proportion of the nuclear family is higher (58.71 per cent) than the proportion of the joint family (41.29 per cent). In Sivasagar district, 65.6 per cent households belong to nuclear family; whereas, 34.4 per cent belong to joint family. On the other hand, the proportion of nuclear family (51.4 per cent) is higher as compared to joint family (48.6 per cent).

District	Nuclear	Joint	Total
Sivasagar	126 (65.6)	66 (34.4)	192 (100)
Dhemaji	93 (51.4)	88 (48.6)	181 (100)
Overall	219 (58.71)	154 (41.29)	373 (100)

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

Traditional societies usually have both larger household sizes (number of members) along with predominance of joint family system. This is particularly true for tribal groups. Interestingly the present findings on the Mishings of Sivasagar and Dhemaji show that unitary or nuclear families are dominating over joint

³⁹A joint family refers to an aggregate of kinspersons where the members share a common residence, a common kitchen, a common purse (including property) and a common set of religious objects. In context of India, joint families are patri-lineal (descent is traced in the male line, from fathers to sons), patri-local (all family members live together and females are moved out after getting married) and patri-archal (male exercise authority).

families. Since we do not have access to past data we are not in a position to examine whether there has been any evolution or shift in pattern from joint to nuclear families during the course of the last three or four decades. Arguably, dominant nuclear families among Mishings in the present study is clearly indicative of a break away from the traditional or orthodox tribal society to the more modern or urban set up where married sons and/or daughters tend to establish independent living units both socially and economically. In other words the newer generation of tribals discourages joint family system which used to be common and very natural during pre-urbanisation or pre-modernisation years. Exposure to media such as print media, television, and other media of mass communication in the current era of globalisation might have also contributed to break away from the traditional joint family set up or system. Work participation in formal sector jobs or urban sector jobs including government jobs also lead to a break-up of the joint family system as because such employment is usually associated with migration or displacement of the job seeker. Migration also provides an escape route from the backward rural belt to the more developed urban dwellings with modern amenities and facilities. However the transition or process of change from traditional to modern family set up is more important which unfortunately is beyond the scope of the present study.

Marital Status

The marital status is the civil status of the individual of a particular society in relation to the marriage laws or their customs and tradition, such as, married, never married, widowed and not remarried, divorced and not remarried, married but legally separated and de facto union in broader sense⁴⁰. Indeed, marital status can be classified into four types⁴¹: i) Single (person who has never been married) ; ii) Married (person living together as husband or wife, legally or consensually); iii) Divorced (person who can remarry as the bond of matrimony has been dissolved

⁴⁰Refers in “Glossary of Statistical Terms: Marital Status”, Organization for Economic Co-operation and Development. Retrieved from <https://stats.oecd.org/glossary/detail.asp?ID=1597> dated 13 May, 2015

⁴¹Cited in “Official Concepts and Definitions for Statistical Purposes: Marital Status”, National Statistical Coordination Board, Philippine Statistics Authority, Republic of Philippines. Retrieved from <http://www.nscb.gov.ph/glossary/terms/indicatorDetails.asp?strIndi=66> dated 13 May, 2014

legally); iv) Separated (person who separated from his/her spouse because of marital discord or misunderstanding; and e) Widowed (person whose bond of matrimony has been dissolved by death of his/her spouse).

Table 4.1.9. Marital Status among the Head of the Households

Districts	Single	Married	Divorced	Separated	Widowed	Total
Sivasagar	3 (1.56)	183 (95.3)	-	2 (1.04)	4 (2.08)	192 (100)
Dhemaji	4 (2.21)	170 (93.92)	-	2 (1.10)	5 (2.76)	181(100)
Overall	7 (1.88)	353 (94.64)	-	4 (1.07)	9 (2.41)	373 (100)

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

Among the members of the households, proportion of single and married persons to the total population are almost same (about 50 per cent) in the two districts. It is evident from figures that single persons in Sivasagar district are 50.50 per cent of population, followed by married (48.15 per cent), widowed (1.08 per cent) and separated (0.27 per cent). Almost same proportion has been seen in Dhemaji district, where married is 49.87 per cent, followed by single (48.80 per cent), widowed (1.16 per cent) and separated (0.18 per cent). It is noteworthy that none is divorced among the Mishings. Percentage of married population among the Mishing tribe is lower as compared to all Assam (43.4) and entire India (47.1) in 2013 (Government of India, 2013b:22).

Table 4.1.10. Marital Status among the Members of the Households

Districts	Single	Married	Divorced	Separated	Widowed	Total
Sivasagar	561 (50.50)	535 (48.15)	-	3 (0.27)	12 (1.08)	1111 (100)
Dhemaji	547 (48.80)	559 (49.87)	-	2 (0.18)	13 (1.16)	1121 (100)
Overall	1108 (49.64)	1094 (49.01)	-	5 (0.22)	25 (1.12)	2232 (100)

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

Body Mass Index

Body mass index (BMI) is a measure or indicator of total body fat based on height and weight of adult men and women. It shows the risk of life-threatening diseases.

BMI is of four Categories: i) Underweight (Below 18.5); ii) Normal weight (18.5–24.9); iii) Overweight (25–29.9); iv) Obesity (30 or and above). The average Body Mass Index (BMI) of the head of the household in Sivasagar district is 20.94 ± 0.14 years, while that in Dhemaji district is 18.69 ± 0.23 years. This implies that majority of household heads are normal weight people. Maximum and minimum BMI of the head of the household in these two districts is 26.10 and 12.90 respectively. BMI of the head of the household of Dhemaji district (12.90) is lower compared to that of Sivasagar district (18.30).

Table 4.1.11. Body Mass Index (BMI) of the Head of the Households

Districts	Total Number (N)	Maximum	Minimum	Mean	Standard Deviation (SD)
Sivasagar	192	26.10	18.30	20.94	0.14
Dhemaji	181	25.21	12.90	18.69	0.23
Overall	373	26.10	12.90	19.85	0.14

Source: Computed on the basis of primary data collected during field survey

As the figures in table 4.1.11 clearly show, the Mishings have little or no tendency of obesity which is an expected result. Although BMI is a physical measure of human health, high BMI is indicative of obesity. On the other hand low BMI is an indicator of ill health, malnourishment or undernourishment. In the present sample the overall mean BMI is within 20 which are on the lower side. The physical nature of the occupations of the Mishings is perhaps responsible for this. In other words the traditional Mishings mostly depend on labour oriented and labour intensive work that includes farming, weaving and also fishing. Apart from these they are also engaged in manual labour oriented jobs in the informal sector. As a consequence high BMI among Mishings are rare.

4.1.2 Educational Profile

Education attainment of the head of the household and that of family members is one of the most significant factors that influence the socio-economic and demographic conditions of the family as well as the society.

Educational attainments of the head of the household (or family, as the case may be) and the same for other members of the household are important in the present study on Mishings for different reasons. The head of the household is conventionally taken as the senior most male member who may or may not be a person belonging to the working age group. In absence of the senior most male member the senior most female member may also be considered as the head of the household. In most cases in India, the head of the household (if under working age group) is the principal bread earner. In case the person is beyond the working age group he/she remains as the head of the family/household but is no longer the principal earner. In such cases one or many of the off-springs (sons or daughters) are most likely to be the earner(s). For example, a sixty plus father may have two married sons living with him in the same household. This creates two joint families but one household with the sixty plus father as the head of the household. However the term principal earner cannot be used in such cases as because both married sons under the same household are earning members. In case of nuclear families the earning member is usually a male member in case of single earner (although exceptions are possible). The presence of adult male and female working members in a nuclear family implies multiple earners in the family with the possibility of higher per capita consumption and income and hence higher living standards. Even in such cases the earning male member is conventionally taken as the head of the family/household.

If we consider a nuclear family, the educational attainment of the head of the household is of immense importance. The levels of skill rise with formal education and higher the skill level higher is the possibility of organised sector employment and hence the possibility of higher earnings. But with low levels of educational attainment, skill levels are low and lower are the chances of participation in formal sector employment and thus wages and earnings are likely to be low. However in a joint family set up even if a single member has exceptional educational attainments it provides him/her with the opportunity of an organised sector job implying an acceptable standard of living for all the rest of the household members even if they

lack in basic educational attainments. Needless to say that if working age group members of a joint family have low educational attainments and low skills, the household is likely to have lesser income per capita, and lesser command over resources due to lower purchasing power.

However from the human development point of view, the focus has to be more on the educational attainments of the younger age group members in the sample compared to the aged. Considering the backwardness of most north eastern tribes, Mishings being no exceptions, households with better educational attainments of children and adolescent in the 7 – 18 years age group, are the households with real capability of a “take-off” from the vicious circle of “low education – low skill – low wages – low standard of living”. In other words households with greater educational participation and attainments among the 7 – 18 years members are those which have a real potential of a take-off from the state of abject poverty and a traditional way of living. Thus educational attainments of the head of the household are given lesser preference from a human development perspective. However lower the educational attainments of the head of the household; the lower is educational attainments of young age group members, although exceptions are possible. Most Indian and Asian studies now recognise the role of mother’s education in shaping the child’s education. Thus a literate mother is highly likely to have literate children. A formally educated mother is likely to have formally educated children. Thus the mothers’ education or female adult education is perhaps the key determinant of take-off for a poor and backward household having limited command over resources.

Educational Attainment of the Head of the Households

Table 4.1.12 contains the survey results of educational attainment of the head of the household. In Sivasagar district, majority (41.67 per cent) of the head of the households attains education till 5th-9th class standard, but 28.12 per cent of the household heads are illiterate. The remaining 9.9 per cent are 10th passed, 8.33 per cent 12th passed, 7.29 per cent 1-4th class standard, 4.69 per cent bachelor and none are post-graduate.

Out of the total number of households for the two districts (373), 130 (34.85 per cent) are illiterate, 144 (38.61) are educated between 5th - 9th class, 34 (9.12 per cent) are educated upto high school, 24 (6.43 per cent) are educated up to primary level (1-4th class), 22 (5.90 per cent) are educated upto higher secondary, 18 (4.83) are graduates and 1(0.27) is post-graduate.

Table 4.1.12. Educational Attainment of the Head of the Households

Districts	Qualification							Total
	Illiteracy*	1-4th Class	5th-9th Class	10th Passed	12th Passed	Graduate	Post Graduate	
Sivasagar	54 (28.12)	14 (7.29)	80 (41.67)	19 (9.9)	16 (8.33)	9 (4.69)	0 (00.00)	192 (100)
Dhemaji	76 (42.0)	10 (5.5)	64 (35.4)	15 (8.3)	6 (3.3)	9 (5.0)	1 (0.06)	181 (100)
Overall	130 (34.85)	24 (6.43)	144 (38.61)	34 (9.12)	22 (5.90)	18 (4.83)	1 (0.27)	373 (100)

Notes: Figures in the brackets indicate the percentages of the total.

*The term “Illiteracy” is used as opposite to “Functional Literacy”

Source: Computed on the basis of primary data collected during field survey

Educational Attainments of the Members of the Households

In Sivasagar district, almost 33 per cent of the sample household members are found to have attained 5th to 9th class level of education. But, beyond this level, this percentage drops drastically to 12.33 for matriculates and below 12th for HS passed. Observations for Dhemaji are also very similar. It is apparent that education beyond the 9th standard is still not popular (see Table 4.1.13).

As table 4.1.12 shows almost 35 percent of the head of the households are illiterate which is an area of concern. A slightly lower percentage is illiterate when it comes to all members. A clear observation is that tertiary and higher education is unpopular among the Mishings. This is expected in traditional societies. However a certain percentage of graduates among the younger generation is indicative of the fact that a few Mishing households have been successful in breaking away from the traditional society and occupation and have moved towards the modern sector or the organised sector. ST reservation policy along with other central and state sponsored schemes of employment generation for backward sections have been successful to a limited extent, as is clear from the educational attainment figures. The dynamics

behind educational backwardness is intricately linked to remoteness and lack of urbanisation. In the present sample of Mishing households in the two districts, it was found that the few young age members who opted for higher education beyond the 10th standard migrated to surrounding urban areas from the village and ultimately did not return to their respective villages after completion of their courses. Lack of educational facilities and infrastructure results in a near permanent migration from rural to urban areas for the few Mishings who are aspirants in higher education. The deeper issue is that the educated and enlightened among the Mishings have a tendency of migrating permanently to nearby urban centres in search of organised sector employment.

Table 4.1.13. Educational Attainment of the Members of the Households

District	Qualification							Total
	Illiteracy	1-4 th Class	5 th -9 th Class	10 th Passed	12 th Passed	Graduate	Post Graduate	
Sivasagar	21.06	17.10	32.94	12.33	11.61	04.77	00.18	100
Dhemaji	30.51	16.32	35.68	8.20	05.44	03.48	00.35	100
Overall	24.55	16.44	35.84	10.26	8.51	4.12	0.27	100

Source: Computed on the basis of primary data collected during field survey

The study depicts (table 4.1.14) that out of the total illiterate persons, 55.90 per cent are females and 44.10 per cent are males. The number of female illiterates in Dhemaji (57.60 per cent) is more than that of Sivasagar district (53.40 per cent). It means females are more uneducated than males. Among the educated persons males are more educated than females at different levels of education. For example, at primary level of education (1-4th class), males (53.62 per cent) are more than females (46.38 per cent). The same hold goods for other levels of education also. Overall and district-wise male-female proportion of persons educated upto Post-graduate are same at 50.00 percent.

Table 4.1.14. Percentage Distribution of Population by Gender and Education
(in per cent) (Horizontally)

Level of Schooling	Sivasagar			Dhemaji			Grand Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Illiteracy	46.60	53.40	100	42.40	57.60	100	44.10	55.90	100
1-4th	48.90	51.10	100	58.47	41.53	100	53.62	46.38	100
5-9 th	49.18	50.82	100	58.00	42.00	100	53.79	46.21	100
10 th pass	62.80	37.20	100	64.13	35.87	100	63.32	36.68	100
12 th Pass	62.00	38.00	100	55.74	44.26	100	60.00	40.00	100
Bachelor	56.60	43.40	100	56.41	43.59	100	56.52	43.48	100
PG	50.00	50.00	100	50.00	50.00	100	50.00	50.00	100
Overall	52.12	47.88	100	53.61	46.39	100	52.87	47.13	100

Source: Computed on the basis of primary data collected during field survey

The result reveals (table 4.1.15) that in Sivasagar district, 21.06 per cent of population (18.83 per cent of males and 23.50 per cent of females) is illiterate. The corresponding percentage for Dhemaji district is 30.51 per cent, (24.13 per cent for males and 37.88 per cent for females). Observing the two sampled districts together, it is evident that the proportion of literate females is higher than that of males; but, males are more literate than females (16.95 > 16.44 for 1-4th class, 34.92 > 33.65 for 5th-9th class, 12.29 > 07.98 for high school passed, 9.66 > 7.22 for higher secondary, and 4.41 > 3.80 for graduates). The proportion of post-graduates among the males and females is same.

Table 4.1.15. Percentage Distribution of Population by Gender and Education
(in per cent) (Vertically)

Level of Schooling	Sivasagar			Dhemaji			Grand Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Illiteracy	18.83	23.50	21.06	24.13	37.88	30.51	21.52	30.61	25.81
1-4th	16.06	18.23	17.10	17.80	14.62	16.32	16.95	16.44	16.71
5-9 th	31.09	34.96	32.94	38.60	32.31	35.68	34.92	33.65	34.32
10 th pass	14.85	09.59	12.33	09.82	06.35	08.21	12.29	07.98	10.26
12 th Pass	13.82	9.21	11.61	05.66	05.19	05.44	09.66	07.22	08.51
Bachelor	05.18	04.32	04.77	03.66	03.27	03.48	04.41	03.80	04.12
PG	0.17	00.19	00.18	00.33	00.38	00.36	00.25	00.29	00.27
Overall	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Computed on the basis of primary data collected during field survey

(Functional) Literacy Rate

Functional Literacy⁴² rate refers to persons (7 years and above) who can read, write and calculate for effective functioning and development of the individual and the community. However, adult literacy rate is defined as the percentage of people ages 15 and older who can, with understanding, both read and write a short simple statement on their everyday life. As per census 2011, average literacy rate of Sivasagar including all tribes within the district was recorded at 80.41 compared to 74.47 of 2001. If we observe gender wise, it was apparent that male literacy rate (85.84 per cent) was higher than the female literacy rate (74.71 per cent). In Dhemaji, overall (including all tribes) literacy rate was 72.70 in 2011 as compared to 64.48 of 2001. In Dhemaji also, males were more literate (79.84 per cent) than females (65.21 per cent). On the other hand, literacy rate among the Mishing tribe was recorded at 69.3 per cent where male were more literate (77.4 per cent) than the female (60.9 per cent).

The table 4.1.16 shows that the effective literacy rates⁴³ among the Mishing tribe in Sivasagar and Dhemaji district are lower (78.94 per and 69.49 per cent respectively) compared to the overall literacy rate (80.41 per cent and 72.70 per cent

⁴²Literacy encompasses a set of skills (such as phonetics, decoding, fluency, vocabulary, and comprehension) and a set of practices (using all of these skills to carry out a text task). As per UNESCO's 1958 definition, literacy refers to "the ability of an individual to read and write with understanding a simple short statement related to his/her everyday life" (UNESCO, 2015: 409). In India, literacy in respect census operations is defined as "the ability to read and write with understanding in any language." There is variation in definitions among the countries as well as national and international institutions. In 1960s, 'literacy' had been linked with socio-economic development and new term "functional literacy" came into existence. UNESCO at the General Conference in 1978, adopted a definition of functional literacy: "A person is functionally literate who can engage in all those activities in which literacy is required for effective functioning of his group and community and also for enabling him to continue to use reading, writing and calculation for his own and the community's development" (UNESCO, 2006: 154). UNICEF defined it as "the ability to use reading, writing and numeric skills for effective functioning and development of the individual and the community." The idea of functional literacy was initiated by UNESCO in 1966 as a part of Experimental World Literacy Programme (EWLP) and continued till 1973.

⁴³ Prior to 1991 census, children below five years of age were treated as illiterates. But one cannot be literate unless he/she has scope to develop their skills. Since 1991 Census, two measures of literacy rate were defined. First, *Effective literacy rate (or literacy rate)*, that is, the total percentage of the population of an area at a particular time aged seven years or above who can read and write with understanding. It is the ratio of the number of literate persons aged 7 or above divided by the population aged 7 and above multiplied by 100. Second, *Crude literacy rate*, that is, the total percentage of the population of an area at a particular time who can read and write with understanding, taking the total population of the area (including below seven years of age). It is the ratio of the number of literate persons divided by total population multiplied by 100.

respectively) of two districts as per census 2011. It is found that the overall literacy rates in the two districts are estimated to be higher as compared to all Assam literacy rate among Mishing tribe.

Table 4.1.16. Literacy Rate			
	2001 [#]	2011 [#]	Mishing Tribe (7 years and above)*
India	64.83	73.0	-
Assam	63.25	73.18	-
Sivasagar	74.47	80.41	78.94
Dhemaji	64.48	72.70	69.49

Sources: # Census of India (2001, 2011) . *Computed on the basis of primary data collected during field survey. This is effective literacy rate of the Mishing population.

Overall Mean Years of Schooling

Mean years of schooling (of adults) is the average number of years of education received by people aged 25 and older, converted from educational attainment levels using official durations of each level (UNDP, 2013:147).⁴⁴ In other words, mean years of schooling is the years that a 25-year-old person or older has spent in school. It is average number of completed years of education of a country's population aged 25 years and older, excluding years spent repeating individual grades.

If the duration of each level of education remains constant over time, the formula can be simplified as follows (UIS, 2013:4 -5).

$$MYS = \sum_l HS_l YS_l$$

Where, MYS= Mean years of schooling

HS_l = Proportion of the population for which the level of education l is the highest level attained

YS_l = Official duration of the level of education l

The formula to calculate MYS adjusted by the duration of individual levels of education as follows

$$MYS = \sum_a \sum_l HS_{al} YS_{al}$$

Where, MYS= Mean years of schooling

⁴⁴ See for details R. J. Barro, and J.W. Lee (2010, April). *A new data set of educational attainment in the world, 1950–2010* (NBER Working Paper No. 15902). Cambridge:National Bureau of Economic Research,

HS_{al} = Proportion of the population in age group a for which the level of education l is the highest level attained

YS_{al} = Official duration of the level of education l for age group a at the time when this age group was in school

MYS of the population aged 25 years and older is the population-weighted average of MYS for each age group a .

Table 4.1.17. Overall Mean Years of Schooling of the Head of the Households

District	Male	Female	All
Sivasagar	-	-	4.44
Dhemaji	-	-	3.79
Overall	-	-	4.15

Source: Computed on the basis of primary data collected during field survey

Overall mean years of schooling of the head of the households is observed at 4.15 years i.e. primary passed. Whereas, mean years of schooling of the head of the households in Sivasagar district (4.44 years) is higher than that of Dhemaji district (3.79 years).

Household-level Education Index

As per UNDP Human Development Report (2010:217; 2011:168) Education Index can be calculated as follows:

Education Index

$$\frac{\sqrt{\text{Mean Years of Schooling Index} \cdot \text{Expected Years of Schooling Index} - \text{Minimum value}}}{\text{Maximum value} - \text{Minimum value}}$$

Here, simple Household-level Educational Index of the Mishig households is calculated with the help of following formula:

$$HEI_i = \frac{MYS \text{ of } MH_i - \text{Min (MYS)}}{\text{Max (MYS)} - \text{Min (MYS)}}$$

Where, HEI_i = Household-level Educational Index of the i th Mishig households

$MYS \text{ of } MH_i$ = Actual value of the Mean Years of Schooling

Min (MYS) = Minimum value of the Mean Years of Schooling

Max (MYS) = Maximum value of the Mean Years of Schooling

Table 4.1.18. Average Household level Educational Index of Sample Blocks				
Districts	Blocks	Block-wise Household-level Educational Index (BHEI)	District-wise Household-level Educational Index (DHEI)	HEI
Sivasagar	Demow	0.546		
	Gaurisagar	0.455	0.457	
	Sonari	0.372		0.459
Dhemaji	Dhemaji	0.522		
	Sissibargaon	0.46	0.461	
	Bordoloni	0.401		

Source: Computed on the basis of primary data collected during field survey

Table 4.1.18 depicts the block-wise and district-wise average household level educational index of the six sample blocks. District-wise average Household level educational indices are estimated at 0.457 and 0.461 in Sivasagar and Dhemaji respectively

4.1.3 Housing Profile

Persons who live in a healthy and sustainable environment can contribute more to the economic development and production process than the counterpart. In narrow sense, housing implies only the physical condition of a house. In broader sense, housing covers household amenities and household assets as well. Thus, the condition and quality of housing (such as, age and condition of the house, type of the dwelling unit, plinth level, floor area and condition, sources of finance in housing) is basic requirement of human well-being. It includes also the availability of basic living facilities in the micro environment of housing (such as drinking water, sanitation etc).

Type of House

The houses of the households are classified into four types: Pucca, Semi-pucca, Pucca-kutchha and Kutchha. In Sivasagar district, majority of respondents (56.8 per cent) are found to live in Kutchha houses, one-fourth of total respondents (25.0 per cent) in Pucca-Kutchha; the remaining (lower proportion) live in Pucca (11.5 per cent)

and Semi-pucca houses (6.8 per cent) respectively. Observations are similar for Dhemaji district, where majority people live in Kutcha houses (72.9 per cent) followed by Pucca-Kutcha (21.0 per cent), Pucca (3.9 per cent) and Semi-pucca houses (2.2 per cent).

The NSSO household level survey data (NSSO, 2014:50) published in 2014 (survey conducted in 2012) showed that in Assam 26.6 per cent of houses were of pucca-type (as compared to just 7.77 per cent for Mishings found in the present study), 58 per cent were of semi-pucca type (27.62 per cent for Mishings found in the present study) and 15.3 per cent houses were of Kutcha type (as compared to just 64.61 per cent for Mishings found in the present study). Thus housing quality found in the present study for Mishings in the two districts of Sivasagar and Dhemaji are far inferior compared to all Assam NSSO figures.

Table 4.1.19. Type of House

Districts	Type of House				Total
	Pucca	Semi-Pucca	Pucca-Kutcha	Kutcha	
Sivasagar	22 (11.5)	13 (6.8)	48 (25.0)	109 (56.8)	192 (100)
Dhemaji	7 (3.9)	4 (2.2)	38 (21.0)	132 (72.9)	181 (100)
Overall	29 (07.77)	17 (4.56)	86 (23.06)	241 (64.61)	373 (100)

Note: Figures in the parentheses indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

Plinth Level

Plinth level of a house is the vertical distance or height of the corresponding ground floor from the general surface of land (on which the building is being constructed). It protects the ground floor of the dwelling unit from the inflow of wastage and dirty water from surrounding areas, such as, roads and drains. Here, a house is considered as “no plinth”, if the ground floor equals the level of the land on which the house stands. Plinth level is recorded, even if the household live on a floor higher or lower than the ground floor. In case of the building comprising more than one structure,

plinth level of the main structure (in the sense of having greatest floor area) is considered (NSSO, 2014:51).

The Mishing tribe, in general, live in two types houses: one, houses with high plinth level where houses are constructed on raised platforms of bamboo and woods above the earth to get rid of furies of floods; second, houses with low plinth level where houses are constructed on earthen floor. Therefore, it is observed that overall, 81.38 per cent households has 4.72 feet plinth level of their dwelling unit and 19.62 per cent live in houses with 1.83 feet plinth levels in Sivasagar and Dhemaji districts.

Floor Area

The floor area indicates the inside floor area of all living rooms, other rooms, covered and uncovered veranda excluding area covered by walls. If a room is utilized both for business that occupies minimal area and residential purposes that occupies large area, the total area of the room is taken into calculation. If only a portion of a room is utilized for residential purposes, then only that portion of the area is considered. If a portion of a room is shared by another household, then the portion of the room occupied by the sample household is included (NSSO, 2014:55).

Table 4.1.20 shows that as high as 50.00 per cent households have 0-400 square feet floor area of the dwelling units in Sivasagar district; and 81.2 per cent households have 0-400 square feet floor area of the dwelling units in Dhemaji district. On the other hand, as low as 6.6 per cent households have 951 and above square feet floor area of the dwelling units in Sivasagar district, whereas, nobody had 951 and above square feet floor area of the dwelling units in Dhemaji district. It is evident that both districts taken together, majority of the households live in houses having floor area of 400 sq ft or less.

Districts	Floor Area per Square Feet				Total
	0-400	401-950	951-1600	1601 and above	
Sivasagar	96 (50.00)	83 (43.1)	7 3.6)	6 (3)	192 (100)
Dhemaji	147 (81.2)	34 (18.8)	0 (00.0)	0 (00.0)	181 (100)
Overall	243 (65.15)	117 (31.37)	7 (01.88)	6 (01.61)	373 (100)

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

The table 4.1.21 shows the distribution of per capita floor area per square feet. It is found that per capita floor area is high in Sivasagar district as compared to Dhemaji district. It is due large size of household in Dhemaji as compared to Sivasagar district.

Districts	Per-capita Floor area (square feet)			
	0-400	401-950	951-1600	1601 and above
Sivasagar	75.61	172.10	276.34	295.08
Dhemaji	71.56	164.08	254.37	287.00

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

Number of Living Rooms of Dwelling Unit

A living room is a part of a dwelling unit. A dwelling unit is an entire structure or a portion or more than one structure. In general, a dwelling unit includes both living room and others, such as, kitchen, store-room toilet, bath-room, veranda etc. In the present study, a room is considered as living room if it is used for living purpose including kitchen and store-room (NSSO, 2014:9-10).

Table 4.1.22 shows the distribution of living rooms of a dwelling unit. As high as 37.0 per cent of sample households have two rooms in Dhemaji district; whereas, one-third (33.3 per cent) households have four rooms in Sivasagar district.

Districts	Number of Rooms						Total
	1	2	3	4	5	6 and above	
Sivasagar	7 (3.6)	20 (10.4)	51 (26.6)	64 (33.3)	26 (13.5)	24 (12.5)	192 (100)
Dhemaji	53 (29.3)	67 (37.0)	38 (21.0)	16 (8.8)	5 (2.8)	2 (1.1)	181 (100)
Overall	60 (16.09)	87 (23.32)	89 (23.86)	80 (21.44)	31 (08.31)	26 (06.97)	373 (100)

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

In Sivasagar, the households having three rooms are 26.6 per cent followed by five rooms (13.5 per cent), six rooms and above (12.5 per cent) and two rooms (10.4 per cent). Contrary to that, the households having one room are 29.3 per cent followed by three rooms (21.0 per cent), four rooms (8.8 per cent) and five rooms (2.8 per cent). Thus around 47.18 percent of the household comprise of 2 to 3 rooms, both districts taken together.

Persons per Room

Table 4.1.23 presents summary data on the persons living per room among the selected Mishing households of Sivasagar and Dhemaji districts. Wide variations in persons living per room is observed in both districts. The minimum is found to be less than 1 which is very desirable situation. On the other extreme, in Sivasagar there are as many as 6 persons per room at the maximum with mean below 2. However, an even worse picture is seen in Dhemaji where as high as 12 persons per room are found with a mean of more than 3. Clearly area enjoyed per person is lower in Dhemaji as mean number of persons are found to be higher.

Districts	Total Number (N)	Maximum	Minimum	Mean	Standard Deviation(SD)
Sivasagar	192	6.00	0.50	1.69	0.07
Dhemaji	181	12.00	0.50	3.56	0.16
Overall	373	12.00	0.50	2.60	0.10

Source: Computed on the basis of primary data collected during field survey

The table 4.1.24 shows that highest 79.69 per cent households in Sivasagar district live in a room having 0-2 persons and 2.60 per cent households live in room with 5-6 persons. Maximum 6 persons live per room in this district. On the other hand, highest 39.78 per cent households used to live in a room of 3-4 persons in Dhemaji district. As low as 11 (7.18 + 3.31 + 0.55) per cent households live in room having 7 and above persons per room in this district. It is observed that maximum households (57.37 per cent) live in rooms dwelling 0-2 persons per room in the two districts.

Table 4.1.24. Persons per Room among the Mishing Households

Districts	Persons per Room						Total
	0-2	3-4	5-6	7-8	9-10	11-12	
Sivasagar	153 (79.69)	34 (17.71)	5 (2.60)	-	-	-	192 (100)
Dhemaji	61 (33.70)	72 (39.78)	28 (15.47)	13 (7.18)	6 (3.31)	1 (0.55)	181 (100)
Overall	214 (57.37)	106 (28.42)	33 (8.85)	13 (3.49)	6 (1.61)	1 (0.27)	373 (100)

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

Floor Structure/Construction

The floor made up of a house has been divided into three categories: soil, RCC, and bamboo and wooden. It has been found during the study that the floor of 82.03 per cent of the households of Sivasagar and Dhemaji district is made up of bamboo and wooden; whereas, 06.70 per cent households have RCC floor and very few households (0.11 per cent) have muddy floor or dirty floor.

Table 4.1.25. Floor Structure

Districts	Floor made up of			Total
	Soil	RCC	Bamboo and Wooden	
Sivasagar	26 (13.5)	18 (9.4)	148 (77.1)	192 (100)
Dhemaji	16 (8.8)	7 (3.9)	158 (87.3)	181 (100)
Overall	42 (0.11)	25 (6.70)	306 (82.03)	373 (100)

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

Bathroom and Sanitation Facility

Bathroom and Sanitation facility are the prime determinants of both health and standard of living that influence socio-economic condition of rural people.

Bathroom facility

In the field study, bathrooms were divided into two categories: attached bathroom and detached bathroom. During 2012, total 15.5 percent households had attached bathroom in rural India while that in urban India was more than three times (55.4 percent). Similarly, during that year, 3.6 percent households had attached bathroom in rural Assam while more than three times (39.8) households had attached bathroom in urban Assam (NSSO, 2014:38). It was observed that 62.3 percent and 16.7 percent of households did not have any bathroom facility in rural and urban India respectively. In Assam, 45.6 percent and 9.2 percent of households in rural area and urban area respectively were without bathroom facility (NSSO, 2014:37).

It has been found during the study that as low as 1.2 percent households have attached bathroom and 98.8 per cent have separate bathrooms among the Mishing tribe of Sivasagar and Dhemaji districts, while 35.3 percent households do not have any bathroom facility.

Sanitation facility

According to the WHO / UNICEF Joint Monitoring Programme (JMP), “An “improved” sanitation facility is one that hygienically separates human excreta from human contact.”⁴⁵Of course, the JMP’s definition differs from country level national definitions. As per NSSO survey of India, the sanitation facility among the households is of four categories: Pucca, Semi-Pucca, Kutcha and Open/outside. The following table 4.1.26 exhibits that 59.52 per cent households do not have sanitation facility, i.e. they either go outside or use open place for defecation purpose. As low as 6.17 per cent households have pucca sanitation, 7.24 per cent have semi-pucca and 27.08 per cent have kutcha sanitation facility. Questions are asked regarding the

⁴⁵ See for details “Improved and unimproved water and sanitation facilities”, Retrieved from <http://www.wssinfo.org/definitions-methods/watsan-categories/> dated 29th Oct, 2013

problem of flies and mosquitoes faced by the households during sanitation. Problem is acute.

Districts	Sanitation Facility				Total
	Pucca	Semi-Pucca	Kutcha	Open/outside	
Sivasagar	18 (9.4)	11 (5.7)	58 (30.2)	105 (54.7)	192 (100)
Dhemaji	5 (2.8)	16 (8.8)	43 (23.8)	117 (64.6)	181 (100)
Overall	23 (6.17)	27 (7.24)	101 (27.08)	222 (59.52)	373 (100)

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

Source of Drinking Water

Safe drinking water implies good health. In this survey, data were collected regarding sources, quality, sufficiency, method of treatment, nature of storage, distance and time required to the source of drinking water to show the clear picture of hygienic drinking water.

Principal source

In our survey, we consider six sources of drinking water- Tap, Well, Hand-pump, Tube-well, River/pond and Others. The data (table 4.1.27) reveals that the highest 96.7 per cent households use tube-well as source of drinking water, 11.53 per cent households use tap or government supply water, 8.85 per cent households collect their drinking water from river or pond, 2.14 per cent households use well and 1.07 per cent use hand-pump as source of drinking water.

Districts	Sources of Drinking water						Total
	Tap	Well	Hand-pump	Tube-well	River/pond	Others	
Sivasagar	43 (22.4)	8 (4.2)	2 (1.0)	105 (54.7)	31 (16.1)	3 (1.6)	192 (100)
Dhemaji	0 (00.0)	0 (00.0)	2 (1.1)	175 (96.7)	2 (1.1)	2 (1.1)	181 (100)
Overall	43 (11.53)	8 (2.14)	4 (1.07)	280 (75.07)	33 (8.85)	5 (1.34)	373 (100.00)

Note: Figures in the brackets indicate the percentages of the total

The WHO / UNICEF Joint Monitoring Programme (JMP)⁴⁶ has defined a list of “Improved” sources drinking-water, viz., piped water into dwelling, piped water to yard/plot, public tap or standpipe, tube-well or borehole, protected dug well, protected spring and rainwater. Whereas, “Unimproved” sources drinking-water includes: unprotected spring, unprotected dug well, cart with small tank/drum, tanker-truck, surface water and bottled water. The NSSO used the same variables in relation to “Improved” and “Unimproved” principal source of drinking water; except “Bottled water”. The NSSO used “Bottled water” as “Improved” sources drinking-water.

Table 4.1.28. “Improved” and “Unimproved” Principal Sources of Drinking Water

Districts	Improved Source				Unimproved Source			Total
	Bottled water	Public tap/Standpipe (1)	Tube well/Borehole (2)	Protected dug well	Surface water: tank/pond (3)	Other surface water (4)	Unprotected dug well	
Sivasagar	0 (0)	43 (22.40)	107 (55.73)	2 (1.04)	28 (14.58)	6 (3.13)	6 (3.13)	192 (100)
Dhemaji	0 (0.00)	0 (0.00)	177 (97.79)	0 (0.00)	2 (1.10)	2 (1.10)	0 (0.00)	181 (100)
Overall	0 (0.00)	43 (11.53)	284 (76.14)	2 (0.54)	30 (08.04)	8 (2.14)	6 (1.61)	373 (100)

Notes: (1) includes “piped water into dwelling”, “piped water to yard/plot” and “public taps/standpipe” and “tap”; (2) includes “tube well/hand pump”; (3) “other tank/pond” but “tank/pond (reserved for drinking)” is excluded; (4) includes river/dam/stream/canal, lake etc.

Source: Computed on the basis of primary data collected during field survey

During 2012, 88.5 percent and 95.3 percent of total households had access to improved sources of drinking water in rural and urban India respectively. Similarly, 85.1 per cent and 9.28 per cent households had improved sources of drinking water in rural and urban Assam respectively (NSSO, 2014:18).

It is evident from the table that 89.01 per cent (80.73 per cent in Sivasagar and 97.79 in Dhemaji district) households of Mishing tribe have improved source of

⁴⁶ According to JMP, “an ‘improved’ drinking-water source is one that, by the nature of its construction and when properly used, adequately protects the source from outside contamination, particularly faecal matter”. See for details “Improved and unimproved water and sanitation facilities”, Retrieved from <http://www.wssinfo.org/definitions-methods/watsan-categories/> dated 29th Oct, 2013

drinking water, whereas, on an average 10.99 per cent households (19.28 per cent in Sivasagar and 2.2 per cent in Dhemaji) have unimproved source of drinking water. No households use bottled water as source of drinking water.

As high as 85.8 percent households in rural India had sufficient drinking water during 2012, whereas the figure being 89.6 per cent for households in urban India. On other hand, 96.1 per cent households had sufficient drinking water in rural Assam, the figure being 94.5 per cent for households in urban Assam (NSSO, 2014:21). It is observed that 95.7 per cent Mishing households have sufficient drinking water, whether it is improved or unimproved.

Distance to principal source of water

Here “within premises” includes both “within dwelling” and “outside dwelling but within premises”. In India, about 46.1 percent rural households received drinking water *within premises* compared to 76.8 per cent urban households. As many as 50.2 per cent rural households and 21.1 percent urban households had *to travel less than half a kilo-metre to fetch drinking water* from the principal sources outside the premises. In Assam 79.1 per cent households in rural area received drinking water within premises and 16.0 per cent households in urban area had to travel less than half a kilo-metre to fetch drinking water from the principal source located outside the premises (NSSO, 2014:25). Among the rural Assam, female members of 84.1 per cent households and male members of 14.1 per cent households were involved in fetching drinking water from a distance.

About 45.4 percent Mishing households get drinking water *within premises*. This figure is just less than figure of rural India (46.1 per cent) and very less than the figure of rural Assam (79.1 per cent). On the other hand, as many as 54.6 percent households have *to travel less than 500 meter to fetch drinking water* from the principal source situated outside the premises. Among the rural Mishing households, female members in 85.5 per cent households and male members in 14.5 percent households are involved in fetching drinking water from a distance.

Treatment of water

Treatment of water implies treatment or purification of water by means of boiling, filtering or by use of chemicals, electronic purifier or by any other method before drinking. In 2012, respectively 32.3 percent and 54.4 percent households in rural and urban India had treated water “by any method” before drinking (NSSO, 2014:32). It was found that the 87.67 percent rural households of Mishing people have treated water “by any method” before drinking.

Storage and method of taking out

Households use two types of containers: i) “non-metal” viz. earthen, plastic, and other non-metal containers and ii) “metal” viz. iron, galvanised, copper, stainless steel, brass, and other metal containers (NSSO, 2014:33).

The Mishing tribe usually uses both types (“non-metal” and “metal”) of containers. From the field survey, it is found that 87.8 per cent rural households use “non-metal” containers; whereas, the remaining 12.2 per cent use “metal” containers.

Access to Electricity

Among the sample villages two villages of Dhemaji district, namely Muktiar and Ratua Pathar did not have any electricity supply or connection. On the other hand the following villages were found to have access to electricity:

District	Village	Sample Households	Households with Electricity Connection
Dhemaji	Kekuri Mishing	53	9 (16.98)
	Bar Mathauri	27	7(25.93)
	Bormuria Bokajan	26	21 (80.77)
	No. 1 Mainapara	25	21 (84.00)
Sivasagar	Dimowmukh	33	15 (45.45)
	Dolopa	44	23 (52.27)
	Thekeratal	26	19 (73.08)
	No.1 Alimur	23	14 (60.87)
	No. 2 Balikhuti	21	14 (66.67)
	Ramnagar	45	32 (71.11)

Note: Figures in the brackets indicate the percentages of the total sample households

Source: Computed on the basis of primary data collected during field survey

Naturally the samples of Mishing households taken from the villages without electricity connection are not expected to have access to electricity. On the other hand only a certain percentage or proportion of sample households taken from the villages having electricity supply or connection were actually found to be using electricity. The highest percentage of households with electricity connection is 84.00 and lowest is 16.98.

Type of Fuel Used for Cooking

The data related to use of different types of fuel for cooking summarized in the following table revealed that the most of the households (82.84 per cent) use woods for domestic purpose and very few (8.58 per cent) use gas (LPG). The table exhibits that both woods and gas are used fuel only by 8.58 per cent of total respondents. Nobody used kerosene. It is noteworthy that both rich and poor households use woods for domestic cooking purpose.

Districts	Type of Fuel Used for Cooking				Total
	Wood	Kerosene	Gas (LPG)	Woods and Gas	
Sivasagar	149 (77.60)	Nil	20 (10.42)	23 (11.98)	192 (100)
Dhemaji	160 (88.40)	Nil	12 (6.63)	9 (4.97)	181 (100)
Overall	309 (82.84)	Nil	32 (8.58)	32 (8.58)	373 (100)

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

Mishings are traditionally known to be using timber or wood for the daily cooking needs. As seen from the table even the upper strata households are found to be using timber as a source of fuel. This is not expected in non-tribal communities who have urbanised a long time back. However Mishing households located in urban and semi-urban settings are also not expected to be using timber as a source of cooking fuel. Timber use for cooking is a typical rural feature in Assam and the entire northeast and can be found even among non-Mishings. Thus settlements away from urban centres are perhaps more responsible for dependence on forest

wood for daily cooking needs. Use of wood implies deforestation and is undesirable from the point of view of environmental sustainability.

4.1.4 Household-level Consumption Expenditure

In developing countries, consumption is considered as better measure of “standard of living.” Deaton & Grosh (2000) rightly argued that “Consumption ... is the best measure of the economic component of living standards”. It is because: a) household incomes are under-reported and b) household incomes are (found to be 30 to 40 per cent) lower than the aggregate of consumption and savings in rural areas.

Generally household consumer expenditure is the aggregate of monetary values of all goods and services consumed by a household on domestic account during a specified period, called reference period. It includes the imputed values of goods and services, which are not purchased but procured for consumption purpose, but excluded the imputed rent of owner-occupied houses, and expenditure incurred in the productive enterprises. Monthly per capita expenditure (MPCE) is the household consumer expenditure over a period of 30 days divided by the household size (NSSO, 2014:9).

Per capita consumption expenditure of the household is one of the prime determinants of economic wellbeing. Per capita consumption expenditure is actually the best measure of command over resources (or purchasing power at the household level) in developing nations. Consequently lack of purchasing power as reflected in lack of command over resources is captured by deprivation in terms of per capita consumption. Thus a minimum acceptable level of per capita consumption should act as a cut off or boundary or a line of demarcation between the economically empowered and the un-empowered. In countries such as India per capita consumption may be more appropriate to determine the line of poverty, as income figures are often difficult to ascertain. Table 4.1.31 details the results of monthly household consumption expenditure and monthly per-capita consumption

expenditure (MPCE) measured in Modified Mixed Recall Period (MMRP)⁴⁷. It is found from the field study that the average Monthly Household Consumption Expenditure and Monthly Per-capita Consumption Expenditure (MPCE) are Rs.13014.09 ± 1231.90 and Rs.2690.54 respectively in Sivasagar district; whereas, the monthly household consumption expenditure in Dhemaji district is Rs.6844.59 ± 355.40 per month with monthly per-capita consumption expenditure (MPCE) of Rs.1655.85 per month. It is observed that monthly household consumption expenditure and MPCE in Sivasagar district are higher as compared to those of Dhemaji district. In 2011-12, the rural average MPCE (measured in MMRP) in Assam and India (NSS 2009-10 & 2011-12 Round) are estimated at Rs. 1219.00 and Rs.1430.00 respectively (Economic Survey 2014-15:A136).

Table 4.1.31. Monthly Household Consumption Expenditure and Monthly Per-capita Consumption Expenditure (MPCE)(Rs./month)

	Districts	Maximum	Minimum	Mean	Standard Deviation
Monthly Household Consumption Expenditure	Sivasagar	96250.00	2085.69	13014.09	1231.90
	Dhemaji	66816.00	1980.92	6844.59	355.40
	Overall	96250.00	1980.92	9929.34	793.65
Monthly Per-capita Consumption Expenditure	Sivasagar	8750.00	695.23	2690.54	221.10
	Dhemaji	5568.00	495.23	1655.85	154.69
	Overall	8750.00	495.23	1448.80	187.90

Source: Computed on the basis of primary data collected during field survey

Household-level Consumption Expenditure on Different Items

The table 4.1.32 shows the share of different food and non-food items among Below Poverty Line (BPL) and Above Poverty Line (APL) Mishing households (in percentage) as a whole in Dhemaji and Sivasagar districts. The BPL households spends more in food items (54.5 per cent) than in non-food items (45.5 per cent);

⁴⁷ In the Modified Mixed Recall Period (MMRP) that is also used by Expert Group (Rangarajan), the consumer expenditure data are gathered from the recall period of: (a) 365-days for clothing, footwear, education, institutional medical care, repairing of premises, ritual related expenses and durable goods, (b) 7-days for edible oil, egg, fish and meat, vegetables, fruits, spices, beverages, refreshments, processed food, pan, tobacco and intoxicants, and (c) 30-days for the remaining food items, fuel and electricity, miscellaneous goods and services including non-institutional medical; rents and taxes (Planning Commission, 2014:54).

while APL households spends more in non-food items (52.5 per cent) as compared to food items (47.5 per cent).

The share of rice (for meals and preparing traditional drink) in total expenditure accounted for as high as 13.3 percent and 11.2 in BPL and APL households. The share of vegetables constitute 8.7 per cent of total expenditure, followed by clothing and bedding (7.2 per cent), repairing premises (6.3 per cent), fuel and electricity (5.5), equally (5.1 per cent) in rituals and milk and milk-made products and so on among the BPL Mishing households. Similarly, the share of cloth and bedding stands at 7.3 per cent of total expenditure, followed by repairing houses (6.9 per cent), vegetables (6.5 per cent), conveyance (6.3 per cent), fuel and electricity (6.2 per cent), milk and milk-made products (5.3), rituals (5.0) and so on among the APL households. It is observed that highest proportion of total expenditure is incurred in rice among both BPL and APL families. It is because, though rice is basically used for staple diet, yet, a large amount of rice is needed for preparing traditional drinks that are used in their daily life, rituals and reception of guests. As compared to other tribes in Dhemaji and Sivasagar districts, as the Mishing tribe is heavily affected by annual floods and soil erosions; so, repairing their damaged houses is a common case in their life-style. That is why; the second highest expenditure in non-food items is made in repairing the flood-affected premises among both BPL and APL families.

According to NSS 2009-10 & 2011-12 Round (MMRP) estimate, rural share of food expenditure in Assam and India was estimated at 61.3 per cent and 52.9 per cent respectively (Economic Survey 2014-15: A136-137). That is, the share of food expenditure (54.5 per cent) to the total expenditure among the Mishing tribe in Sivasagar and Dhemaji districts exceeds the all India level and lower than the all Assam figure.

Table 4.1.32. Share of Different Food and Non-food Items among BPL and APL Households (in percentage)

Sl.No.	Items groups	BPL rural households	APL rural households
1	Rice for meals and preparing traditional drink	13.3	11.2
2	Other cereals & substitutes	0.9	1.1
3	Pulses & similar products	3.8	3.5
4	Milk & milk-made products	5.1	5.3
5	Salt, sugar & molasses	2.7	1.8
6	Edible oil	4.2	3.1
7	Egg, fish, & meat (pork, mutton)	4.9	4.4
8	Vegetables	8.7	6.5
9	Fruits	1.3	1.9
10	Spices	3.4	3.0
11	Misc (other food)	6.2	5.6
	Food Total (A)	54.5	47.4
12	Pan, tobacco & intoxicants	3.4	2.6
13	Fuel and electricity	5.5	6.2
14	Medical treatment (Institutional & non-institutional)	2.5	3.4
15	Conveyance/transportation	3.6	6.3
16	Rent (land and house)	0.7	0.9
17	Clothing & bedding	7.2	7.3
18	Footwear	1.3	1.8
19	Education	3.3	4.7
20	Durable goods	2.1	2.5
21	Mobile	1.9	2.2
22	Rituals	5.1	5.0
23	Repairing of premises	6.3	6.9
24	Misc. (other non-food)	2.6	2.8
	Non-food Total (B)	45.5	52.6
	Total (A+B)	100.00	100.00

Source: Computed on the basis of primary data collected during field survey

4.1.5. Occupational⁴⁸ Status

The Occupation or livelihood of a household is defined on the basis of the sources of the household's income during the 365 days. For this purpose, only the household's income (net income, but not gross income) from economic activities was considered.

In rural area, occupation of a household is divided into the six categories⁴⁹: (i) Self-employed in agriculture, (ii) Self-employed in non-agriculture, (iii) Regular wage/salary earning, (iv) Casual labour in agriculture, (v) Casual labour in non-agriculture and (f) Others. A household who did not have any income from economic activities was classified under others. Of course, in urban area, four different types of occupation are found: (a) self-employed, (b) regular wage/salary earners, (c) casual labour and (d) others (NSSO, 2014:13).

There may be two or more earners in a household and there may be occupational diversification. This implies concept of principal earning members doesnot exist in a strict sense. But, for the sake of convenience, if there are multiple earners, the senior most earners are considered as Head of household. Head of the household may be an aged person with no current income, but sons/daughter/family members may be working and earning in same household. It implies that Head of the household may not be presently an earner. But, in a traditional society, such as Mishings Head of the household is usually easy to identify.

⁴⁸The terms "occupation" and "profession" are used interchangeably. These two terms are almost the same, but have minor differences. Extensive and specialized training and knowledge are required for a profession; whereas, these are not needed for an occupation. A profession becomes an occupation when an individual is paid (for his/her skills or expertise or knowledge). But, an individual engaged in an occupation are paid not his/her skills or expertise or knowledge, but for his/her output or production. For example, designing a building is a profession, but constructing a building is an occupation.

⁴⁹Here, self-employed refers to a person who operates his own farm or non-farm enterprise or is absorbed independently in a profession or business having own-account or with one or more partners. Main features of a self-employed are: autonomy (to decide how, where and when to produce) and economic independence (choice of market, scale of operation, finance) in his/her activity. Regular wage/salaried employee is a person who works in his/her farm or non-farm enterprises (both household and non-household) and, in return, receive salary or wages regularly (i.e. not on the basis of daily or periodic renewal work contract). The persons getting time wage or receiving piece wage or salary and paid apprentices, both full time and part-time are included in this category. Casual wage labourer is a person who is casually engaged in others' farm or non-farm enterprises (both household and non-household) and, in return, receive wages according to the terms of the daily or periodic work contract(NSSO,2011:15).

Percentage Distribution of Head of the Households according to the Occupations

An over-whelming majority (66.9) of head of households in Dhemaji district is found pursuing cultivation as prime occupation that is more than two times as compared to Sivasagar district (24.5 per cent). In Sivasagar district, self-employed in non-agriculture is 20.8 per cent of total head of the households followed by 16.7 per cent in others, 16.1 per cent in regular wage/salary earning, 12 per cent casual labour in non-agriculture and 9.9 per cent in casual labour in agriculture. In contrary, equally 10.5 per cent of head of the households each belong to business and allied and others in Dhemaji district. Similarly, equally 5.0 per cent each belong to casual labour in non-agriculture and regular wage/salary earning as occupation. As low as 2.2 per cent of total households belong to occupation as casual labour in agriculture (See table Table 4.1.33).

Around 72 per cent of the heads of the selected Mishing households in Dhemaji are found to be engaged in agriculture and are actually cultivators. The corresponding figure for Sivasagar district is just around 28 per cent clearly indicating that the Mishings in Dhemaji are more dependent on agriculture (paddy cultivation to be more precise) compared to the Mishings residing in Sivasagar. Although non-Mishings are not considered in our present study, it is quite possible that Dhemaji as a district is more agrarian in nature compared to Sivasagar.

Table 4.1.33. Percentage Distribution of the Head of the Households according to the Occupations (Vertically)

Occupations	Sivasagar	Dhemaji	Combined
Self-employed in agriculture	47 (24.5)	121 (66.9)	168
Casual labour in agriculture	19 (9.9)	4 (2.2)	23
Casual labour in non-agriculture	23 (12.0)	9 (5.0)	32
Self-employed in non-agriculture	40 (20.8)	19 (10.5)	59
Regular wage/salary earning	31 (16.1)	9 (5.0)	40
Others	32 (16.7)	19 (10.5)	51
All	192 (100)	181 (100)	373

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

Except, self-employed in agriculture, the proportion of all other occupations (casual labour in agriculture, casual labour in non-agriculture, self-employed in non-agriculture, regular wage/salary earning and others) in Sivasagar district are higher than their counterparts (See table 4.1.34) in Dhemaji.

Table 4.1.34. Percentage Distribution of the Head of the Households according to the Occupations (Horizontally)

Occupations	Sivasagar	Dhemaji	Combined
Self-employed in agriculture	47 (27.98)	121 (72.02)	168 (100)
Casual labour in agriculture	19 (82.61)	4 (17.39)	23 (100)
Casual labour in non-agriculture	23 (71.88)	9 (28.13)	32 (100)
Self-employed in non-agriculture	40 (67.80)	19 (32.20)	59 (100)
Regular wage/salary earnings	31 (77.50)	9 (22.50)	40 (100)
Others	32 (62.75)	19 (37.25)	51 (100)
All	192 (51.47)	181 (48.53)	373 (100)

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

As seen in table 4.1.35, as high as 75.7 per cent of total households are self-employed in Dhemaji district and that is estimated at 54.2 per cent in Sivasagar district. No child or students are found among the head of the households. Very few are unemployed (1.6 per cent in Sivasagar and 1.1 per cent in Dhemaji) and housewives (8.3 per cent and 5.0 per cent).

Table 4.1.35. Employment Status of the Head of Households

Personal Status	Sivasagar	Dhemaji	Combined
House wife	16 (8.3)	9 (5.0)	25 (100)
Retired and non-workers (Old and disabled)	40 (20.8)	28 (15.5)	68 (100)
Unemployed	3 (1.6)	2 (1.1)	5 (100)
Employed	29 (15.1)	5 (2.8)	34 (100)
Self-employed	104 (54.2)	137 (75.7)	241 (100)
All	192 (100)	181 (100)	373 (100)

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

4.1.6 Village Profile

Type of Road:

The results in table 4.1.36 shows that as high as 46.4 per cent of total road is made up of sand and stone in Sivasagar district, whereas as high as 65.7 per cent of total road is made up of soil. Equally 14 per cent road each in these two districts are metalled and pitch.

Districts	Type of road			Total
	Soil	Sand and stone	Metalled/Pitch	
Sivasagar	77 (40.1)	89 (46.4)	26 (13.5)	192 (100)
Dhemaji	119 (65.7)	36 (19.9)	26 (14.4)	181 (100)
Overall	196 (52.55)	125 (33.51)	52 (13.94)	373 (100)

Note: Figures in the brackets indicate the percentages of the total

Source: Computed on the basis of primary data collected during field survey

Land possessed

In this survey, the “area of land possessed” included land “owned”, “leased in” and “land neither owned nor leased in” (i.e. encroached) by the household, but excluded land “leased out” (NSSO, 2014:14). The table 4.1.37 displays the total and per capita land holdings (owned) in Dhemaji and Sivasagar districts among the Mishing Tribe. Average per-capita owned land holdings in Dhemaji is higher (1.25 bighas) than that of Sivasagar (0.81 bighas).

District	Land	Mean	Min.	Max.	S.D.	C.V.	Skewness	Ex. Kurtosis
Dhemaji	Total land holdings (Bigha)	7.17	0.00	24.00	5.62	0.78	1.07	0.98
	Land-holdings per capita	1.25	0.00	5.00	1.11	0.89	1.54	2.17
Sivasagar	Total land holdings	4.47	0.00	30.00	4.65	1.03	2.20	6.85
	Land-holdings per capita	0.81	0.00	4.00	0.81	0.99	1.48	1.87

Source: Computed on the basis of primary data collected during field survey

4.2 Poverty, Inequality and Human Development

A poverty profile sets out the major facts on poverty and examines the pattern of poverty to see how it varies by geography, community characteristics, household and individual characteristics. A poverty profile is descriptive, but it serves as the basis for the analysis of poverty. Hence, a poverty profile is a comprehensive poverty comparison, showing how poverty varies across subgroups of society. There are two main ways of presenting a poverty profile. The first splits the sample by some characteristic—for instance, region of residence, or age of household head then shows the poverty rate for each component (Haughton & Khandelker, 2010: 121-126).

4.2.1 Absolute Poverty

4.2.1.1 Absolute Poverty in Dhemaji District

The estimate of depth of poverty that is measured by Poverty Gap Index (PGI) and severity of poverty that is measured by Squared Poverty Gap Index (SPGI) provides complementary information on the incidence of poverty that is measured by Headcount Ratio (HC). In some cases, high incidence of poverty (HC) is found with low depth of poverty (PGI). It implies that many households are just below the poverty line, but with just low level of income or consumptions. In other cases, low incidence of poverty (HC) is accompanied by high depth of poverty (PGI) which means that few households are below the poverty line, but with extremely low levels of income or consumption.

Here, we follow the recommendation of Expert Group (Rangarajan) 2014 in place of Expert Group (Tendulkar) 2013 and take Rs. 1009.66 as the state-specific poverty line for rural Assam⁵⁰ to calculate rural poverty among the Mishings.

⁵⁰The Expert Group (Rangarajan), 2014 estimated poverty lines from the MMRP (Modified Mixed Recall Period) consumption expenditure NSS data of the 68th Round (2011-12). Implicit prices of

The following table 4.2.1 exhibits the absolute poverty among the Mishing Tribe in Dhemaji District. The data reveals that incidence of poverty in Dhemaji district is highest (38.71 per cent) in the Sissibargaon block followed by Dhemaji block (36.25 per cent) and Bordoloni block (35.90 per cent). Depth of poverty is higher in Bordoloni (17.67 per cent) as compared to Dhemaji (16.28 per cent) and Sissibargaon (15.70 per cent) blocks. It means that 16.28 per cent of the poverty line is required to escape rural poverty in Dhemaji block, whereas, Sissibargaon and Bordoloni blocks require 15.70 per cent and 17.67 per cent of poverty line to escape from poverty. The similar facts are observed among the blocks in case of severity of poverty also. The severity of poverty is estimated highest at 09.83 per cent in Bordoloni block, implying that there is higher inequality among the poor in block compared to the other blocks.

According to Head-Count ratio (HC), Bordoloni block stands with the third poverty rate compared to other two blocks, but the block is ranked first in both Poverty Gap Index (PGI) and Squared Poverty Gap Index (SPGI). It means, Bordoloni block has lower proportion of poor, but the extent to which individuals falls below the poverty line is high and poverty tends to be highly severe, as compared to other two blocks.

The average Kakwani Index in Dhemaji district is 0.267 with higher value in Sissibargaon block (0.2759) followed by Dhemaji (0.2694) and Bordoloni (0.2564). In case of Thon Index, Bordoloni block has higher value (0.2989) followed by Dhemaji (0.2794) and Sissibargaon (0.2663).

commodities are calculated from the quantity of consumption and their values. Then, Fisher price index has been computed, separately for both rural and urban sector. For the remaining items where prices could not be computed, a similar price differential has been assumed (Planning Commission, 2014:63). For this reason, here, we follow the recommendation of Expert Group (Rangarajan) in place of Expert Group (Tendulkar) 2013. According to Expert Group (Rangarajan) state-specific poverty line of Assam in Rural and Urban areas for 2011-12 are Rs. 1009.66 and Rs. 1420.12 respectively.

Block	Head- Count ratio (HC) (percent)	Poverty Gap Index (PGI) (percent)	Squared Poverty Gap Index (SPGI) (x 100)	Kakwani Index	Thon Index	Sen Index
Dhemaji	36.25	16.28	08.68	0.2694	0.2794	0.0354
Sissibargaon	38.71	15.70	07.54	0.2759	0.2663	0.0312
Bordoloni	35.90	17.67	09.83	0.2564	0.2989	0.3980

Source: Computed on the basis of primary data collected during field survey

4.2.1.2 Absolute Poverty in Sivasagar District

The table 4.2.2 details the results of absolute poverty among the Mishing Tribe in Sivasagar District. It has been observed that the incidence of poverty of households is highest (32.70 per cent) in Gaurisagar block followed by Demow block (31.20 per cent) and Sonari block (25.80 per cent) in Sivasagar District. Depth of poverty is high in Demow (06.62 per cent) as compared to Gaurisagar (05.99 per cent) and Sonari (05.48 per cent) blocks. The same holds good among the blocks in case of severity of poverty also. Gaurisagar block is worst among the blocks in terms of Head-Count ratio (HC), but stands at third position in Squared Poverty Gap Index (SPGI) and in second position in Poverty Gap Index (PGI). These variations of ranks in poverty measures means that Gaurisagar block has high proportion of poor, but the extent to which individuals falls below the poverty line is low and severity of poverty tends to be lower as compared to other two blocks.

The values of Kakwani Index, Thon Index and Sen Index are higher in Demow block (0.1310, 1.4000 and 0.0840 respectively) as compared to Gaurisagar and Sonari blocks.

Table 4.2.2. Absolute Poverty among the Mishing Tribe in Sivasagar District
(N=192)

Block	Head- Count ratio (HC) (percent)	Poverty Gap Index (PGI) (percent)	Squared Poverty Gap Index (SPGI) (x 100)	Kakwani Index	Thon Index	Sen Index
Demow	31.20	06.62	01.73	0.1310	1.4000	0.0840
Gaurisagar	32.70	05.99	01.33	0.0980	0.8350	0.0780
Sonari	25.80	05.48	01.41	0.0940	0.8380	0.0690

Source: Computed on the basis of primary data collected during field survey

The outcomes of incidence of poverty among Dhemaji and Sivasagar Districts (in percentage) are given in the table 4.2.3. Incidence of poverty at the household level is highest in Sissibargaon block (38.71 per cent). Other blocks (36.25 per cent in Dhemaji block and 35.90 per cent in Bordoloni block) in Dhemaji district have lower incidence. Incidence of poverty in terms of population is 40.30 per cent, 35.01 per cent and 32.79 per cent in Sissibargaon, Dhemaji and Bordoloni blocks respectively in Dhemaji district. It is to be noted that incidence of poverty in terms of individuals, is low in Dhemaji (35.01 per cent < 36.35 per cent) and Bordoloni block (32.79 per cent < 35.9 per cent) than their incidence of poverty in terms of households. In Sivasagar district, on the other hand, incidence of poverty is high (32.70 per cent) in Gaurisagar block in terms of households ,but Demow block is worst in incidence of poverty (35.21 per cent) in terms of individuals. Similarly, incidence of poverty in terms of individuals is high as compared to the incidence of poverty in terms of households in the three blocks of Sivasagar district.

Table 4.2.3. Incidence of Poverty among Dhemaji and Sivasagar Districts
(in percentage)

Dhemaji Blocks	Households			Individuals			Sivasagar Blocks			Households			Individuals		
	Poverty Incidence	Rank		Poverty Incidence	Rank		Poverty Incidence	Rank		Poverty Incidence	Rank		Poverty Incidence	Rank	
Dhemaji	0.3625	2		0.3501	2		Demow	0.3120	2		0.3521	1			
Sissibargaon	0.3871	1		0.4030	1		Gaurisagar	0.3270	1		0.3389	2			
Bordoloni	0.3590	3		0.3279	3		Sonari	0.2580	3		0.2690	3			

Source: Computed on the basis of primary data collected during field survey

It is observed that incidence of poverty is high in villages of those block (such as, Sissibargaon and Gaurisagar) which are highly flood-affected and are remote. In contrast, incidence of poverty is low in the villages of those blocks (such as, Bordoloni and Sonari) that are less-flood affected or mixed populated with short distance to town.

In the press note on poverty estimates, 2011-12 published in 22 July, 2013, planning commission released the latest poverty estimates of India. It was observed that the percentage of persons below the poverty line in 2011-12 has been estimated at 25.7 per cent for rural areas, 13.7 per cent for urban areas and 21.9 per cent for the country as a whole. The respective ratios for the rural and urban areas were 41.8 per cent and 25.7 per cent and 37.2 per cent for the country as a whole in 2004-05. On the other hand, percentage of BPL in 2011-12 has been estimated as 33.89 per cent in rural areas, 20.49 per cent in urban areas and 31.98 per cent as a whole for Assam (Planning Commission, 2013).

Average level of poverty in Dhemaji and Sivasagar district is higher as compared to average level of Assam. Because, Mishing people basically dwell on banks of rivers and every year they are heavily affected by floods. The recurrent floods lead to heavy loss of assets, livelihood and sometimes even property.

4.2.2. Relative Poverty

4.2.2.1 Relative Poverty in Dhemaji District

A Range ratio or Range (R) value lies in between one and infinity and the smaller values reflect more equality in distribution. Similarly, ceteris paribus, the lower the Relative Mean Deviations (RMD), the higher equality in distribution. This is same as for Variance (V), Coefficient of Variation (CV) and Standard Deviation of Log (SDL). Table 4.2.4 contains the survey results of relative poverty among the Mishing tribe in Dhemaji district. The R is as high as 3.27 in Dhemaji and Bordoloni block. The RMD comes out at 3.238 in Bordoloni block that is higher as compared to Sissibargaon block (0.490) and Dhemaji (0.475). The CV and SDL are higher in Dhemaji block. Atkinson Index is higher in Dhemaji (0.1916) block as compared to

other blocks (0.1882 in Bordoloni and 0.1817 in Sissibargaon). Atkinson Index value of 0.1916 implies that 19.16 per cent of total income has to be sacrificed in order to have equal incomes. The Relative Theil Index i.e. Theil RE (1) in Bordoloni block is 0.2126 which means that inequality in the simulated income distribution is about 21.26 per cent of the maximum inequality as measured by Theil Index.

Table 4.2.4. Relative Poverty among the Mishing Tribe in Dhemaji District (N=181)

Blocks	Range (R)	RMD	Variance (V)	Coefficient of variance (CV)	Standard deviation of log (SDL)	Atkinson Index	Theil E(0)	Theil E(1)	Theil RE(1)
Dhemaji	3.27	0.48	570218.14	0.68	0.70	0.19	0.21	0.20	0.05
Sissibargaon	3.18	0.49	549758.04	0.65	0.68	0.18	0.20	0.19	0.05
Bordoloni	3.27	3.24	490203.51	0.67	0.69	0.19	0.21	0.19	0.05

Source: Computed on the basis of primary data collected during field survey

4.2.2.2 Relative Poverty in Sivasagar District

The result in table 4.2.5 shows the relative poverty among the Mishing tribe in Sivasagar district. The value of range in three blocks shows negligible difference in inequality of income among the Mishing households. The level of range is higher (9.84) in Sonari block and low (4.59) in Demow block. Relative mean deviations (RMD) (0.822, 0.875 and 0.844 respectively) of the three blocks imply almost identical distributions of income or else. The income distributions in each block donot differ much. The variance is highest in Sonari with 12700184 and lowest in Demow with 4953952. The coefficient of variation (CV) and standard deviation of logarithms (SDL) are around 1 (one) in the three blocks. The Theil index of E(0), E(1) and RE(1) are 0.408, 0.43 and 0.099 respectively in Demow block; 0.522, 0.509 and 0.131 in Gaurisagr block ; and 0.477, 0.564 and 0.135 in Sonari block.

Table 4.2.5. Relative Poverty among the Mishing Tribe in Sivasagar District (N=192)

Blocks	Range (R)	RMD	Variance (V)	Coefficient of variance (CV)	Standard deviation of log (SDL)	Atkinson Index	Theil E(0)	Theil E(1)	Theil RE(1)
Demow	4.59	0.82	4953952	1.06	0.93	0.33	0.41	0.43	0.10
Gaurisagar	6.38	0.88	11341643	1.18	1.11	0.41	0.52	0.51	0.13
Sonari	9.84	0.84	12700184	1.43	0.98	0.38	0.48	0.56	0.14

Source: Computed on the basis of primary data collected during field survey

The relative poverty or inequality is higher in Sivasagar district as compared to Dhemaji district. It is perhaps because, Dhemaji, a highly flood affected district, is almost entirely rural in nature where prime occupation of villagers is agriculture or more specifically paddy farming. Characteristics of villages, occupation pattern and quality of life are almost same in this district. On the other hand, Sivasagar district is less flood affected with a more urban character. It has a vibrant tea industry, oil and natural gas and brick industry. Some Mishing households in Sivasagar are engaged in allied activities of agriculture, business and services sector. There are observable variations in nature of villages and households in this district. Thus, inequality of income and wealth is expectedly high in Sivasagar district. Heterogenous occupations, rural urban divide, along with constricting geographic features give rise to inequality.

4.2.3 Absolute Poverty and Relative Poverty (Economic Inequality) within and across Occupations

After the works of Kuznets (Kuznets, 1955; Kuznets, 1963) on the relationship between economic growth and income inequality, interest of research has grown up in the sources of income inequality, especially in the developing countries. In the recent empirical studies, (income or consumption) inequalities are decomposed

across economic sectors (say, urban vs. rural), income sources (say, farmers vs. services), and family characteristics (say, education).

Absolute Poverty within and across Occupations in Dhemaji District

The poverty incidence of households is highest among casual labour in non-agriculture (77.78 per cent) followed by self-employed in agriculture (45.45 per cent), self-employed in non-agriculture (21.05 per cent) and others (5.26 per cent). Similarly, depth of poverty is highest among casual labour in non-agriculture (42.62 per cent) followed by self-employed in agriculture (20.09 per cent), self-employed in non-agriculture (7.51 per cent). Severity of poverty is highest among daily wage labourer (23.62 per cent) followed by self-employed in agriculture (10.59 per cent), and self-employed in non-agriculture (2.68 per cent). Incidence, depth and severity of poverty are highest among casual labour in non-agriculture followed by casual labour in agriculture. These are nil among casual labour in agriculture and regular wage/salary earning. It is because the wage in casual labour in agriculture and non-agriculture is very small. Jobs are irregular, scope is very limited and dignity of labour is considered to be low. It is worth noted that scope of economic activities as casual labour in agriculture is higher as compared to that in non-agriculture and moreover Dhemaji is by far a rural district.

Table 4.2.6. Absolute Poverty within and across Different Occupations in Dhemaji District (N=181)

Occupations	Head-Count ratio (HC) (percent)	Poverty Gap Index (PGI) (percent)	Squared Poverty Gap Index (SPGI) (x 100)
Self-employed in agriculture	45.45	20.09	10.59
Casual labour in agriculture	56.08	31.22	13.26
Casual labour in non-agriculture	77.78	42.62	23.62
Self-employed in non-agriculture	21.05	7.51	2.68
Others	5.26	0.42	0.03
Overall	36.95333	16.55	8.683333

Source: Computed on the basis of primary data collected during field survey

Relative Poverty (Economic Inequality) within and across Different Occupations in Dhemaji District

The results of economic inequality within and across different occupations in Dhemaji district is reported in table 4.2.7. Among six categories of occupation in Dhemaji district, the range ratio (R) is as high as 3.83 among self-employed in agriculture and as low as 0.40 among casual labour in agriculture. The occupation as self-employed in non-agriculture stands at rank one with the value of 0.58 in RMD. The coefficient of variation (0.64) and standard deviation of log (0.74) are higher in the same occupation (self-employed in non-agriculture). Gini coefficient is higher among the self-employed in non-agriculture followed by self-employed in agriculture. The reasons most likely are variability of earnings and expenditures, diversity of economic activities and inheritance of income and wealth among the self-employed persons who are absorbed in agriculture and non-agriculture sector. Self employed are anticipated to have higher inequality, especially if it is the non-agricultural sector where occupations are diverse.

Table 4.2.7. Economic Inequality within and across Different Occupations in Dhemaji District (N=181)

Occupations	Range (R)	RMD	Variance (V)	Coefficient of variance (CV)	Standard deviation of log (SDL)	Gini Coefficient
Self-employed in agriculture	3.84	0.47	363203.57	0.64	0.66	0.33
Casual labour in agriculture	0.40	0.13	23901.40	0.16	0.15	0.05
Casual labour in non-agriculture	1.49	0.49	107723.39	0.60	0.50	0.27
Self-employed in non-agriculture	1.69	0.58	1402127.11	0.64	0.74	0.35
Service	0.65	0.13	92976.76	0.19	0.17	0.09
Others	1.27	0.33	280827.17	0.36	0.33	0.20

Source: Computed on the basis of primary data collected during field survey

Absolute Poverty within and across Different Occupations in Sivasagar District

Table 4.2.8 contains illustrations of absolute poverty within and across different occupations in Sivasagar district. The poverty incidence of households is highest among

casual labour in agriculture (73.68 per cent) followed by casual labour in non-agriculture (47.83 per cent), others (34.39 per cent), self-employed in agriculture (25.53 per cent) and self-employed in non-agriculture (22.50 per cent). Depth of poverty is highest among casual labour in agriculture (15.48 per cent) followed by casual labour in non-agriculture (9.67 per cent), self-employed in non-agriculture (4.97 per cent). The same trend is revealed in severity of poverty also. Incidence and depth of poverty are highest among the casual labour in agriculture followed by casual labour in non-agriculture. The reasons are same as in case of Dhemaji district. In addition, scope of job among casual labour in non-agriculture is more as compared to those in agricultural sector and Sivasagar is of semi-urban character with lots of scope of economic activities in non-agriculture.

Table 4.2.8. Absolute Poverty within and across Different Occupations in Sivasagar District (N=192)

Occupations	Head-Count ratio (HC) (percent)	Poverty Gap Index (PGI) (percent)	Squared Poverty Gap Index (SPGI) (x 100)
Self-employed in agriculture	25.53	4.00	0.72
Casual labour in agriculture	73.68	15.48	4.16
Casual labour in non-agriculture	47.83	9.67	1.83
Self-employed in non-agriculture	22.50	4.97	1.39
Others	34.38	7.23	1.96
Overall	29.9	6.03	1.49

Source: Computed on the basis of primary data collected during field survey

Relative Poverty (Economic Inequality) within and across Different Occupations in Sivasagar District

As seen in table 4.2.9 the Range (R) is as high as 5.61 among cultivators and as low as 1.13 among casual labour in non-agriculture in Sivasagar district. The coefficient of variance (1.01) is higher among self-employed in agriculture and Standard deviation of log (0.90) is higher among the self-employed in non-agriculture persons. It is observed that inequality is high in case of self-employed in non-

agriculture followed by regular wage/salary earners and self-employed in agriculture. It is due to the variability of wage/salary structures among the self-employed and regular salary earners, diversity in living conditions, location of housing (flood and erosion affected or not) and distance from town (demonstration affect on the households by the urban living style).

Table 4.2.9. Economic Inequality within and across Different Occupations in Sivasagar District (N= 192)

Occupations	Range (R)	RMD	Variance (V)	Coefficient of variance (CV)	Standard deviation of log (SDL)	Gini coefficient
Self-employed in agriculture	5.61	0.59	2187649.43	1.01	0.63	0.37
Casual labour in agriculture	2.91	0.37	303945.23	0.64	0.41	0.24
Casual labour in non-agriculture	1.13	0.28	91013.43	0.34	0.32	0.18
Self-employed in non-agriculture	3.46	0.71	4621770.79	0.87	0.90	0.45
Regular wage/salary earning	3.77	0.53	24758939.5	0.78	0.87	0.38
Others	2.96	0.73	2909195.04	0.88	0.85	0.44

Source: Computed on the basis of primary data collected during field survey

4.2.4 Decomposing the Gini Index by Sources of Consumption Expenditure

4.2.4.1 Decomposing the Gini Index by Sources of Consumption Expenditure in Dhemaji District

Table 4.2.10 provides a step by step summary of decomposing the Gini Index by sources of consumption expenditure in Dhemaji district. It has been observed that Gini Index is higher among the self-employed in agriculture (12.00) and lower among casual labour in agriculture of sample six villages of Dhemaji district. Total Gini Index of cluster sample yields at 21.90 indicating 21.90 per cent inequality in distribution of consumption expenditure.

Table 4.2.10. Decomposing the Gini Index by Sources of Consumption Expenditure in Dhemaji District (N=181)

Villages	Cumulative distribution function	Total consumption expenditure	Self-employed agriculture	Casual labour in agriculture	Casual labour in non-agriculture	Self-employed non-agriculture	Regular wage/salary earning	Other
Ratua	0.17	16270.19	9490.25	-	-	3721.40	1597.05	1461.49
Pathar								
No.1	0.20	26509.11	14235.38	1988.33	1644.76	5582.11	1597.05	1461.49
Mainapara								
Bormuria	0.25	27793.01	17082.46	994.17	548.25	1860.70	-	7307.43
Bokajan								
Bar Mathauri	0.33	30295.31	19929.53	-	-	7442.81	-	2922.97
Muktiar	0.50	42429.68	20878.56	-	548.25	7442.81	4791.14	8768.92
Kekuri	1.00	57895.57	33215.89	949.03	2193.01	9303.51	6388.19	5845.95
Chapari								

Covariance (total,total) = 3669.48; Covariance (total, Self-employed in agriculture) = 2018.00; Covariance (total, Casual labour in agriculture) = -1.69;
Covariance (total, Self-employed in non-agriculture) = 153.05; Covariance (total, Self-employed in non-agriculture) = 545.29;
Covariance (total, Regular wage/salary earning) = 583.37; Covariance (total, Others) = 371.46
Gini Index(Casual labour in agriculture)= 0.120; Gini Index (Self-employed in agriculture)= 0.000; Gini Index (Self-employed in non-agriculture) = 0.009; Gini Index (Business and self-employed) = 0.033; Gini Index (Regular wage/salary earning) = 0.035; Gini Index (Others) = 0.022;
Total Gini Index = 0.219

Source: Computed on the basis of primary data collected during field survey

Table 4.2.11. Decomposing the Gini Index by Sources of Consumption Expenditure in Sivasagar District (N=192)

Villages	Cumulative distribution function	Total consumption expenditure	Self-employed in agriculture	Casual labour in agriculture	Casual labour in non-agriculture	Self-employed in non-agriculture	Regular wage/salary earning	Other
Thekeratal	0.17	52809.00	7304.76	5999.03	2689.29	9933.98	19158.17	7723.78
No.2 Balikuri	0.20	56726.02	8765.71	-	896.43	9933.98	25544.23	11585.67
Dikhowmukh	0.25	76960.37	5843.81	4285.02	5378.57	19867.95	31930.29	9654.73
No 1 Alimur	0.33	83815.43	7304.76	-	-	7450.48	57474.52	11585.67
Ramnagar	0.50	84467.99	17531.42	3428.02	9860.71	24834.94	19158.17	9654.73
Dolopa	1.00	109884.65	21914.27	2571.01	1792.86	27318.43	44702.40	11585.67

Covariance (total, total) = 4951.06; Covariance (total, Self-employed in agriculture) = 1584.73;
Covariance (total, Casual labour in agriculture) = -48.80; Covariance (total, Casual labour in non-agriculture) = 46.07;
Covariance (total, Self-employed in non-agriculture) = 1710.85; Covariance (total, Regular wage/salary earning) = 1481.21;
Covariance (total, Others) = 177.00

Gini Index (Self-employed in agriculture) = 0.041; Gini Index (Casual labour in agriculture) = -0.001; Gini Index (Casual labour in non-agriculture) = 0.001; Gini Index (Self-employed in non-agriculture) = 0.044; Gini Index (Regular wage/salary earning) = 0.038; Gini Index (Others) = 0.005; Total Gini Index = 0.13

Source: Computed on the basis of primary data collected during field survey

4.2.4.2 Decomposing the Gini Index by Sources of Consumption Expenditure in Sivasagar District

The results in table 4.2.11 show that the inequality in income distribution is lowest among casual labour in agriculture and casual labour in non-agriculture as shown by Gini Index of casual labour in agriculture (-0.1) and Gini Index of casual labour in non-agriculture (0.10) and high among the Self-employed in non-agriculture (0.40) of sample six villages of Sivasagar district.

4.2.5 Household-level Human Development Index (HHDI) and Inequality-adjusted Household-level Human Development Index (IHHDI).

As per UNDP (2014) Human Development Report, Human Development Index (HDI) value and Inequality-adjusted HDI (IHDI) value of India was recorded at 0.586 and 0.418 respectively with the world rank 135. The HDI value of Assam stood at 0.474 with all India rank 11 as per latest Human Development Report of India (IHDR, 2011).

Table 4.2.12 portrays the dimension indices and household-level HDI value of Dhemaji and Sivasagar districts. HDI value in Sivasagar district stands at 0.536 and the corresponding figure in Dhemaji district stands at 0.520. Examination of results, however, reveals two reasons for higher HDI value in Sivasagar district as compared to Dhemaji district. First, Health Index, Mean Years of Schooling (MYS) and Per-capita Consumption Expenditure (PCE) are higher in Sivasagar district as compared to Dhemaji district. Second, Mishong villages in Sivasagar are less-flood affected with lower distance from urban centres and higher avenues of other than in agriculture occupations. Locational disadvantage is lower in Sivasagar.

Table 4.2.12. Dimension Indices and Household-level HDI value of Dhemaji and Sivasagar Districts

Dhemaji		Sivasagar	
Health Index	0.613	Health Index	0.632
Education index	0.461	Education index	0.457
Consumption index	0.499	Consumption index	0.534
HDI (taking log)	0.520	HDI(taking log)	0.536
HDI (taking Gini)	0.401	HDI (taking Gini)	0.415

Source: Computed on the basis of primary data collected during field survey

Table 4.2.13 details results of the value of IHHDI indicators and Atkinson's inequality measure. The geometric mean of mean years of schooling does not allow zero values, so one year is added to all valid observations of mean years of schooling to compute the inequality.

The inequality-adjusted HDI was introduced in the 2010 human development report. This new index captures the distributional dimensions of human development. Based on it, the three dimensions of HDI (education, health and per capita expenditure) are adjusted for inequalities in attainments across people of the Mishong community. The result shows that Atkinson's inequality measure for distribution of health score, MYS and household consumption expenditure in Dhemaji district constituted 28.35 per cent, 16.24 per cent and 32.08 percent respectively; whereas these values in Sivasagar district are 07.85 per cent, 13.39 per cent and 56.94 per cent respectively. Inequality-adjusted Household-level Human Development Index (IHHDI) values of Dhemaji and Sivasagar districts have been accounted for 0.30 and 0.26 respectively. Household-level Human development index (HDI) values using unlogged PCE are estimated at 0.41 and 0.37 in Dhemaji and Sivasagar district respectively. Loss due to inequality in Dhemaji and Sivasagar districts are 25.86 per cent and 29.95 per cent respectively.

Districts	Table 4.2.13. Indicators of IHDI and Atkinson's Inequality Measure										
	Atkinson's inequality measure for distribution of		Inequality-adjusted dimensional indices				Inequality-adjusted indices		Household-level Human development index (HDI)		Coefficient of human inequality
	Health score	Mean years of schooling	Household consumption expenditure	Health index	Education index	PCE index	Inequality-adjusted Household Development Index (IHDI)	Household-level Human development index (HDI)	Loss due to inequality	per cent	per cent
Dhemaji	28.35	16.24	32.08	0.44	0.33	0.19	0.30	0.41	25.86	25.56	25.56
Sivasagar	07.85	13.39	56.94	0.58	0.34	0.80	0.26	0.37	29.95	26.06	26.06

Source: Computed on the basis of primary data collected during field survey

Association of Human Development and Multi-dimensional Poverty

The Multi-dimensional Poverty Index (MPI) identifies the deprivations across the same three dimensions (Health, Education and Living standard) as used in Human Development Index (HDI). A person is identified as multi-dimensionally poor (or “MPI poor”) if they are deprived in at least one third of the weighted indicators of the said three dimensions. The MPI value is the product of two poverty measures e.g. Headcount Ratio (H) and Intensity (or breadth) of Poverty (A). The HDI value is simple average of the three dimension indices: Life Expectancy Index, Education index and Income index (Alkire and Santos, 2010:7; Alkire, Conconi and Seth, 2014:16). It is evident from the following table 4.2.14 that MPI value is low and HDI value is high in the villages, like Thekeratal, Ramnagar, No.1 Mainapara, and Bormuria Bokajan; because, these villages are mixed populated, not-flood affected and near to urban area. Contrary to that, MPI value is high and HHDI value is low in the villages, such as, Bar-mathauri, Kekuri Mishing, Ratua Pathar and Muktiar; for these villages are highly flood –affected, not-mixed populated and remote to the urban area. These results confirm that flood, demographic composition and remoteness affect poverty and human development.

The estimates of the linear regression of HHDI on MPI based on 373 households of 12 sample villages of Dhemaji and Sivasagar districts are presented in the table. The R^2 , which is .945, significantly high and the equation is significant at 0.000 level ($p < .01$). We can be 95 per cent confident that the population regression coefficient for MPI will lie between $-0.62624 (=B + 1.96 \times SE)$ and $-0.84576 (=B - 1.96 \times SE)$. The t-value (-13.144) and F-value (172.752) are statistically significant at 0.00 level. The negative value of MPI coefficient is -.736 which signifies that Human development is negatively associated with multi-dimensional poverty. It implies that the households who are multi-dimensionally poor (i.e. high MPI value) are deprived in education, health and living standard that leads to low level of human development (i.e. low HHDI value).

Table 4.2.14. Components and Dimensions of MPI and HHDI

Village	District	Multi-dimensional Poverty Index					Household-level Human Development Index							
		Components		Rank	Dimension		Dimension			HHDI (value)	Rank			
		H (Headcount ratio)	A (Intensity of poverty)		Education	Health	Standard of living	Health Index	Education Index			Consumption Index		
1	Thekeratal	Sivasagar	0.380	0.392	0.149	1	14.01	13.08	72.91	0.645	0.476	0.578	0.562	1
2	Ramnagar	Sivasagar	0.390	0.401	0.156	2	12.11	14.9	72.99	0.633	0.464	0.558	0.547	2
3	No.2 Balikhuti	Sivasagar	0.384	0.422	0.162	3	12.02	14.85	73.13	0.629	0.469	0.532	0.539	3
4	No.1 Mainapara	Dhemaji	0.392	0.523	0.205	4	12.19	13.49	74.32	0.612	0.459	0.531	0.530	4
5	BormuriaBokajan	Dhemaji	0.421	0.521	0.219	5	15.22	11.29	73.49	0.605	0.364	0.563	0.499	5
6	No 1 Alimur	Sivasagar	0.529	0.461	0.244	7	11.20	15.30	73.50	0.628	0.341	0.540	0.487	6
7	Dolopa	Sivasagar	0.521	0.445	0.232	6	13.12	13.21	73.67	0.637	0.341	0.503	0.478	7
8	Barmathauri	Dhemaji	0.592	0.432	0.256	8	15.13	10.34	74.53	0.614	0.322	0.538	0.474	8
9	KekuriMishing	Dhemaji	0.609	0.440	0.268	9	13.12	12.95	73.93	0.606	0.303	0.526	0.459	9
10	RatuaPathar	Dhemaji	0.556	0.521	0.290	11	11.54	11.98	76.48	0.613	0.350	0.434	0.453	10
11	Demowmukh	Sivasagar	0.533	0.520	0.277	10	12.72	10.34	76.94	0.621	0.305	0.458	0.443	11
12	Muktiar	Dhemaji	0.621	0.543	0.337	12	10.98	12.29	76.73	0.600	0.299	0.441	0.429	12

Source: Computed on the basis of primary data collected during field survey

Table 4.2.15. HHDI and MPI Model Statistics

	Un-standardized Coefficients		Standardized Coefficients		t	Sig.	R ²	Adjusted R ²	F	Durbin-Watson
	B	Std. Error	Beta	Beta						
Constant	.663	.013			49.446**	.000	.945	.940	172.752**	2.621
MPI	-.736	.056		-.972	-13.144**	.000				

Predictor: (Constant), MPI and Dependent Variable: HDI ; Degree of freedom: 1,10
 ** Significant at 0.00 level

Source: Computed on the basis of primary data collected during field survey

4.3. Econometric Analysis of Poverty

4.3.1 Results of Ordinary Least Squares Models

Correlation Coefficients for the Variables Used in the Regression in Dhemaji District

Table 4.3.1 provides a summary profile of correlation coefficients for the variables used in the regression in Dhemaji district. These results confirm that per-capita consumption expenditure (PCE) is negatively and significantly correlated with dependency ratio (DR), and distance from nearest urban (Dis); but positively and significantly correlated with numbers of earner (NoE), Mean Years of Schooling (MYS), BMI, physical assets per household (PA), landholding per household (Land) and livestock per household (Live).

Linear Regression Results of the Determinants of Per-capita Consumption Expenditure in Dhemaji District

The regression coefficient (B) reveals the change in the dependable variable for each unit change in the independent variables and the standard error of regression coefficient (SEB) is an estimate of how much the regression coefficient will vary between samples of the same size taken from the same population. A log linear multivariate model is estimated to verify the effects of socio-economic and demographic variables on rural poverty of the Mishing tribe. Thus, multiple regression was conducted to determine the best linear combination of type of family, size of household, dependency ratio, sex ratio, age of HoH (years), number of earner, mean years schooling, health index (BMI), physical assets (per household in Rs.), landholding (per household in bigha), livestock (per household in Rs.), distance from nearest urban and flood dummy (condition of area) for predicting poverty. This combination of variables significantly predicted poverty, $F(7, 167) = 148.19$, $p < .001$, with all thirteen variables significantly contributing to the prediction. The empirical result shows that the explanatory power of the regression equation as measured by R^2 is significantly high ($R^2 = 0.92$).

Table 4.3.1.1. Correlation Coefficients for the Variables Used in the Regression in Dhemaji District (N=181)

	PCE	SoH	DR	FMR	AHH	NoE	MYS	BMI	PA	Land	Live	Dis
SoH	-.074	1										
DR	-.171*	-.070	1									
FMR	-.078	-.005	.162*	1								
AHH	.109	.467**	-.146	-.017	1							
NoE	.909**	-.064	-.142	-.044	.136	1						
MYS	.391**	.004	.049	.002	.080	.384**	1					
BMI	.881**	.005	-.205**	-.013	.128	.814**	.415**	1				
PA	.681**	-.144	-.071	-.021	-.020	.622**	.228**	.523**	1			
Land	.503**	-.254**	-.197**	.095	-.011	.492**	.217**	.446**	.407**	1		
Live	.502**	-.307**	-.208**	-.029	-.016	.472**	.171*	.498**	.321**	.650**	1	
Dis	-.861**	-.037	.165*	-.028	-.200**	-.821**	-.488**	-.913**	-.509**	-.422**	-.440**	1

Notes: PCE= Per-capita Consumption Expenditure; SoH= Size of Household; DR= Dependency Ratio; FMR= Female Male Ratio (Members); AHH= Age of the Head of the Household; NoE= No. of Earmers; MYS= Mean Years of Schooling; BMI= Body Mass Index; PA (Rs)= Physical assets per household (Rs); Land = Landholding per household (Bigha); Live = Livestock per household (Rs); Dis= Distance from nearest Urban.

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Source: Computed on the basis of primary data collected during field survey

It implies that about 92 per cent of the variation in the dependable variable (logarithm of per capita consumption expenditure) is due to the aforesaid thirteen explanatory variables and the remaining 18 per cent is due to other unmentioned variables. In other words, high R^2 indicates the statistical fitness of the model used to analyse the determinants of the poverty. The adjusted R squared value was 0.91. This indicates that 91 per cent of the variance in the dependable variable was explained by the variations in the independent variables.

Table 4.3.2 contains the results for the analysis of determinants of poverty in Dhemaji district type of family, numbers of Earner, health index (BMI), and physical assets (per household in Rs) are found to be statistically significant and have positive sign; i.e., these variables have significant and positive effect on per-capita consumption expenditure. The coefficients of sex ratio and the distance to nearest urban centres have negative sign and statistically significant. It implies that these two variables have negative impact on per-capita consumption expenditure (PCE).

Log-linear Regression Results of the Determinants of Per-capita Consumption Expenditure in Dhemaji District

A log linear multivariate model is estimated to verify the effects of socio-economic and demographic variables on rural poverty of the Mishing tribe. Thus, multiple regression was conducted to determine the best linear combination of type of family, size of household, dependency ratio, sex ratio, age of head of household (years), number of earner, mean years schooling, health index (BMI), physical assets (per household in Rs), landholding (per household in Bigha), livestock (per household in Rs), distance from nearest urban, and flood dummy (whether the household is affected by flood and erosion) for predicting poverty.

Income gives actual economic power of a household, but expenditures or consumption give actual standard of living of that household. Table 4.3.3 reports the results of the determinants of poverty in Dhemaji district using log of per-capita consumption expenditure as dependent variable. The explanatory power of the regression equations which is measured by R^2 is significantly high (R^2 is 0.97 in two equations). It implies that 97 per cent of the variation in the dependent variable

Table 4.3.2. Linear Regression Results of the Determinants of Per-capita Consumption Expenditure in Dhemaji District (N=181)

Variables	Model--I				Model--II			
	B	SEB	t-ratio	p-value	B	SEB	t-ratio	p-value
Type of family	266.53	60.09	4.44	0.00	272.90	58.36	4.68	0.00
Size of household	-4.03	9.58	-0.42	0.67	-	-	-	-
Dependency ratio	-0.20	0.29	-0.69	0.49	-	-	-	-
Sex ratio	-0.65	0.30	-2.15	0.03	-0.57	0.29	-1.97	0.05
Age of HoH (years)	-0.01	1.43	-0.01	0.99	-	-	-	-
No. of earner	478.18	47.50	10.07	0.00	492.35	45.73	10.77	0.00
Mean years schooling	3.87	7.88	0.49	0.62	-	-	-	-
Health index (BMI)	105.45	15.56	6.78	0.00	108.21	14.68	7.37	0.00
Physical assets (per household in Rs.)	0.02	0.00	4.86	0.00	0.02	0.00	5.24	0.00
Landholding(per household in bigha)	16.73	20.75	0.81	0.42	-	-	-	-
Livestock (per household in Rs.)	0.00	0.01	0.36	0.72	-	-	-	-
Distance from nearest Urban	-10.32	4.35	-2.37	0.02	-9.51	3.98	-2.39	0.02
Flood dummy	-17.07	35.80	-0.48	0.63	-	-	-	-
Constant	-148.50	40.07	-3.71	0.00	-159.58	35.95	-4.44	0.00
	R-square	0.92	Akaike criterion	13.68	R-square	0.92	Akaike criterion	13.62
	Adjusted R ²	0.91	Hannan-Quinn	13.92	Adjusted R ²	0.92	Hannan-Quinn	13.74
	Log-likelihood	-	Schwarz criterion	13.78	Log-likelihood	-	Schwarz criterion	13.67
	F(13, 167)	1223.71	Durbin-Watson statistic	1.85	F(6,174)	1225.22	Durbin-Watson statistic	1.85
	P-value (F)	148.19		0.00	P-value (F)	328.52		0.00

Notes: Dependant variable: Per-capita Consumption Expenditure.

A dash (-) refers to the situation where corresponding variables are dropped in the equations

Source: Computed on the basis of primary data collected during field survey

Table 4.3.3. Log-linear Regression Results of the Determinants of Per-Capita Consumption Expenditure in Dhemaji District (N=181)

Variables	Model-I				Model-II			
	B	SEB	t-ratio	p-value	B	SEB	t-ratio	p-value
Type of family	0.02	0.03	0.56	0.58	-			
Size of household	-0.00	0.00	-0.17	0.87	-			
Dependency ratio	-0.00	0.00	-1.85	0.07	-0.00	0.00	-2.03	0.04
Sex ratio	-0.00	0.00	-0.28	0.78	-			
Age of HoH (years)	-0.00	0.00	-0.60	0.55	-			
No. of earner	0.03	0.02	1.28	0.20	-			
Mean years schooling	0.00	0.00	0.14	0.89	-			
Health index (BMI)	0.16	0.01	20.03	0.00	0.17	0.01	24.07	0.00
Physical assets (per household in Rs.)	0.00	0.00	1.96	0.05	0.00	0.00	3.19	0.00
Landholding(per household in bigha)	0.02	0.01	1.48	0.14	-			
Livestock (per household in Rs.)	0.00	0.00	0.15	0.88	-			
Distance from nearest Urban	-0.01	0.00	-5.22	0.00	-0.01	0.00	-6.49	0.00
Flood dummy	-0.04	0.02	-2.13	0.04	-0.04	0.02	-2.09	0.04
Constant	4.06	0.21	19.74	0.00	4.02	0.17	23.57	0.00
R-square	0.97	0.97	Akaike criterion	-1.47	R-square	0.97	Akaike criterion	-1.52
Adjusted R ²	0.97	0.97	Hannan-Quinn	-1.23	Adjusted R ²	0.97	Hannan-Quinn	-1.41
Log-likelihood	147.42	147.42	Schwarz criterion	-1.37	Log-likelihood	143.36	Schwarz criterion	-1.47
F(13, 167)	477.07	477.07	Durbin-Watson statistic	1.98	F(5,176)	1241.38	Durbin-Watson statistic	1.95
P-value (F)	0.00	0.00	P-value (F)	0.00				

Notes: Dependant variable: Log of Per-capita Consumption Expenditure.

A dash (-) refers to the situation where corresponding variables are dropped in the equations to reduce multi-collinearity

Source: Computed on the basis of primary data collected during field survey

(natural log of per capita consumption expenditure) is due to the explanatory variables and the remaining 3 per cent is due to other unmentioned variables.

Income gives actual economic power of a household, but expenditures or consumption give actual standard of living of that household. Table 4.3.3 reports the results of the determinants of poverty in Dhemaji district using log of per-capita consumption expenditure as dependent variable. The explanatory power of the regression equations which is measured by R^2 is significantly high (R^2 is 0.97 in two equations). It implies that 97 per cent of the variation in the dependent variable (natural log of per capita consumption expenditure) is due to the explanatory variables and the remaining 3 per cent is due to other unmentioned variables.

The test of significance (F-test) is accepted at the 1per cent level of significance in two Models. The data reveals that health index (BMI) and physical assets (per household in Rs.) have significant and positive effect on per-capita consumption expenditure. Dependency ratio, distance to the nearest urban centres and condition of area (flood dummy) have negative impact on per-capita consumption expenditure (PCE). From the empirical results, it is suggestive that socioeconomic as well as demographic variables have a significant impact on the consumption expenditure of households and on reduction of poverty incidence in Dhemaji district.

Correlation Coefficients for the Variables Used in the Regression in Sivasagar District

The table 4.3.4, in which twelve variables are depicted, illustrates correlation for the variables used in the regression in Sivasagar district. The estimates in table show that per-capita consumption expenditure (PCE) is positively and significantly correlated with numbers of earner (NoE), mean years of schooling (MYS), Body Mass Index (BMI), physical assets per household (PA) and landholding per household (Land). The correlation coefficients of dependency ratio (DR), and distance from nearest urban (Dis) are significant with negative signs. It signifies that these variables are negatively correlated with PCE.

Table 4.3.4. Correlation Coefficients for the Variables Used in the Regression in Sivasagar District (N=192)

	PCE	SoH	DR	FMR	AHH	NoE	MYS	BMI	PA	Land	Live	Dis
SoH	-.128	1										
DR	-.247**	.018	1									
FMR	-.051	.059	-.062	1								
AHH	.010	.472*	-.014	.011	1							
NoE	.331**	.313**	-.180*	.035	.122	1						
MYS	.448**	.020	-.421**	-.066	.142*	.253**	1					
BMI	.612**	-.112	-.273**	-.075	.058	.285**	.435**	1				
PA	.563**	.079	-.211**	-.041	.125	.230**	.292**	.349**	1			
Land	.251**	-.152*	-.176*	-.100	-.083	.178*	.278**	.295**	.234**	1		
Live	.051	.048	-.126	.039	.125	-.024	.003	.005	.076	.047	1	
Dis	-.431**	.174*	.205**	.026	.058	-.264**	-.300**	-.485**	-.223**	-.195**	.014	1

Notes: PCE= Per-capita Consumption Expenditure; SoH= Size of Household; DR= Dependency Ratio; FMR= Female Male Ratio (Members); AHH= Age of the HoH; NoE= No. of Earner; MYS= Mean Years of Schooling; BMI= Body Mass Index; PA (Rs)= Physical Assets per household (Rs); Land = Landholding per household(Bigha); Live = Livestock per household (Rs); Dis= Distance from nearest Urban.

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Source: Computed on the basis of primary data collected during field survey

Despite dropping insignificant variables, the R-square & adjusted R² values remain almost same. Moreover, the significant coefficients have very small absolute values that are below 0.0001, which raises doubts about their importance in the model. Landholding is statistically insignificant. By far the most important finding seems to be that remoteness and occurrence of floods are two significant factors that have a depressing effect on PCE. In other words, locational disadvantage & recurrent floods are two factors responsible for poverty among Mishing living in Dhemaji district.

Linear Regression Results of the Determinants of Per-capita Consumption Expenditure in Sivasagar District

Table 4.3.5 contains illustrations of determinants of poverty in Sivasagar district. In this regression model log of per-capita consumption expenditure is used as dependant variable. Size of household and condition of area (flood-affected) has significantly negative sign. It shows that an additional increase in these variables reduces per-capita consumption expenditure or increases poverty. The coefficients of numbers of income earners, mean years schooling, BMI, and physical assets (per household in Rs.) have positive signs and statistically significant. The values of the coefficients indicate that an additional increase in these variables would increase per-capita consumption expenditure or reduce poverty.

Log-linear Regression Results of the Determinants of Per-capita Consumption Expenditure in Sivasagar District

The data in table 4.3.6 reveals that type of family, number of earner, mean years schooling, health index (BMI), physical assets (per household in Rs.) and land holding (per household in Bigha) have significant and positive effect on log of per-capita consumption expenditure; and size of household, the distance to the nearest urban centres and condition of area (flood dummy) have negative impact on log of per-capita consumption expenditure (PCE).

Table 4.3.5. Linear Regression Results of the Determinants of Per-capita Consumption Expenditure in Sivasagar District (N=192)

Variables	Model-I				Model-II			
	B	SEB	t-ratio	p-value	B	SEB	t-ratio	p-value
Type of family	77.94	422.27	0.18	0.85	-			
Size of household	-222.72	85.49	-2.61	0.01	-231.71	72.17	-3.21	0.00
Dependency ratio	-2.18	2.73	-0.80	0.43	-			
Sex ratio	-0.40	2.00	-0.20	0.84	-			
Age of HoH (years)	-3.95	12.54	-0.32	0.75	-			
No. of earner	590.88	252.97	2.34	0.02	592.64	244.83	2.42	0.02
Mean years schooling	199.96	68.68	2.91	0.00	172.09	61.77	2.79	0.01
Health index (BMI)	477.98	100.89	4.74	0.00	472.58	96.75	4.88	0.00
Physical assets(per household in Rs)	0.05	0.01	7.26	0.00	0.04	0.01	7.18	0.00
Landholding(per household in Bigha)	187.09	201.55	0.93	0.35	-			
Livestock (per household in Rs)	0.03	0.03	0.98	0.33	-			
Distance from nearest Urban	-15.57	31.30	-0.50	0.62	-			
Flood dummy	-931.13	424.02	-2.20	0.03	-923.26	340.13	-2.71	0.01
Constant	-7961.02	2337.22	-3.41	0.00	-8204.15	2045.56	-4.01	0.00
	R-square	0.59	Akaike criterion	18.14	R-square	0.58	Akaike criterion	18.08
	Adjusted R ²	0.56	Hannan-Quinn	18.38	Adjusted R ²	0.57	Hannan-Quinn	18.20
	Log-likelihood	-	Schwarz criterion	-	Log-likelihood	-	Schwarz criterion	-
	F(13, 178)	1727.26	Durbin-Watson statistic	18.23	F(6,185)	1729.07	Durbin-Watson statistic	18.13
	P-value (F)	19.82		1.93	P-value (F)	43.22		1.94
		0.00				0.00		18.08

Notes: Dependant variable: Per-capita Consumption Expenditure.

A dash (-) refers to the situation where corresponding variables are dropped in the equations.

Source: Computed on the basis of primary data collected during field survey

Table 4.3.6. Log-linear Regression Results of the Determinants of Per-capita Consumption Expenditure in Sivasagar District (N=192)

Variables	Model-I				Model-II			
	B	SEB	t-ratio	p-value	B	SEB	t-ratio	p-value
Type of family	0.18	0.09	1.91	0.06	0.15	0.09	1.68	0.09
Size of household	-0.04	0.02	-2.05	0.04	-0.04	0.02	-2.49	0.01
Dependency ratio	0.00	0.00	0.59	0.55	-			
Sex ratio	0.00	0.00	1.56	0.12	-			
Age of HoH (years)	0.00	0.00	-0.55	0.58	-			
No. of earner	0.20	0.06	3.54	0.00	0.20	0.06	3.69	0.00
Mean years schooling	0.05	0.02	3.42	0.00	0.05	0.01	3.37	0.00
Health index (BMI)	0.16	0.02	7.25	0.00	0.16	0.02	7.21	0.00
Physical assets (per household in Rs)	0.00	0.00	4.13	0.00	0.00	0.00	4.08	0.00
Landholding (per household in bigha)	0.08	0.04	1.91	0.06	0.08	0.04	1.85	0.07
Livestock (per household in Rs)	0.00	0.00	-0.01	1.00	-			
Distance from nearest Urban	-0.02	0.01	-2.29	0.02	-0.02	0.01	-2.46	0.01
Flood dummy	-0.40	0.09	-4.35	0.00	-0.40	0.09	-4.41	0.00
Constant	3.77	0.51	7.35	0.00	3.91	0.50	7.86	0.00
R-square		0.76	Akaike criterion	1.29	R-square	0.76	Akaike criterion	1.27
Adjusted R ²		0.75	Hannan-Quinn	1.53	Adjusted R ²	0.75	Hannan-Quinn	1.44
Log-likelihood	-109.93		Schwarz criterion	1.39	Log-likelihood	-111.49	Schwarz criterion	1.33
F(13, 178)			Durbin-Watson statistic		F(9,182)		Durbin-Watson statistic	
P-value (F)		44.50		1.87	P-value (F)	64.33		1.86
		0.00				0.00		

Notes: Dependable variables: Log of Per-capita Consumption Expenditure

A dash (-) refers to the situation where corresponding variables are dropped in the equations

Source: Computed based on primary data collected from field survey

Linear Regression Results of the Determinants of Per-capita Consumption Expenditure in Dhemaji and Sivasagar Districts

Table 4.3.7 contains illustrations of determinants of poverty in Dhemaji and Sivasagar districts. In this regression model per-capita consumption expenditure is the dependant variable. Size of household has significantly negative sign. It means an additional increase size of household reduces per-capita consumption expenditure or increases poverty. The coefficients of type of family, numbers of earners, mean years schooling, BMI, physical assets (per household in Rs.) and livestock (per household in Rs.) have positive signs and statistically significant. The values of the coefficients indicate that an additional increase in these variables would increase per-capita consumption expenditure or reduce poverty.

Log-linear Regression Results of the Determinants of Per-capita Consumption Expenditure in Dhemaji and Sivasagar Districts

Table 4.3.8 reports the results of the determinants of poverty in Dhemaji district using log of log of per-capita consumption expenditure as dependent variable. The explanatory power of the regression equations which is measured by R^2 is significantly high (R^2 is 82.00 in two equations). It implies that 82 per cent of the variation in the dependent variable (natural log of per capita consumption expenditure) is due to the explanatory variables and the remaining 18 per cent is due to other unmentioned variables. In other words, high R^2 indicates the statistical fitness of the model used to analyse the determinants of the poverty. The adjusted R squared value was 0.81. This indicates that 81per cent of the variance in the dependable variable was explained by the variations in the independent variables. The overall test of significance (F-test) is rejected at the 1per cent level of significance in two Models.

The type of family dummy is found to be statistically significant and has positive sign. The coefficient suggests that nuclear families on and average have higher per capita consumption expenditure. The numbers of earners in the household has a significant role in poverty reduction.

Table 4.3.7. Linear Regression Results of the Determinants of Per-capita Consumption Expenditure in Dhemaji and Sivasagar Districts (N=373)

Variables	Model-I				Model-II			
	B	SEB	t-ratio	p-value	B	SEB	t-ratio	p-value
Type of family	930.43	191.83	4.85	0.00	1030.47	174.17	5.92	0.00
Size of household	-140.62	44.89	-3.13	0.00	-126.97	38.41	-3.31	0.00
Dependency ratio	-0.29	1.40	-0.21	0.84	-	-	-	-
Sex ratio	-0.47	1.22	-0.39	0.70	-	-	-	-
Age of HoH (years)	-1.90	6.85	-0.28	0.78	-	-	-	-
No. of earner	427.18	145.38	2.94	0.00	380.28	131.99	2.88	0.00
Mean years schooling	102.18	35.84	2.85	0.00	99.61	35.14	2.84	0.00
Health index (BMI)	327.57	54.06	6.06	0.00	307.99	38.37	8.03	0.00
Physical assets (per household in Rs.)	0.05	0.00	10.49	0.00	0.05	0.00	10.58	0.00
Landholding (per household in bigha)	64.01	93.76	0.68	0.50	-	-	-	-
Livestock (per household in Rs.)	0.04	0.02	2.20	0.03	0.04	0.02	2.49	0.01
Distance from nearest Urban	-17.32	16.22	-1.07	0.29	-	-	-	-
Flood dummy	-267.32	195.76	-1.37	0.17	-	-	-	-
Constant	-5982.83	1409.08	-4.25	0.00	-5342.12	744.82	-7.17	0.00
R-square	0.58	Akaike criterion		17.57	R-square	0.57	Akaike criterion	
Adjusted R ²	0.56	Hannan-Quinn		17.72	Adjusted R ²	0.57	Hannan-Quinn	
Log-likelihood	-3262.70	Schwarz criterion		17.63	Log-likelihood	-3264.35	Schwarz criterion	
F(12, 360)	37.92	Durbin-Watson statistic		1.99	F(7, 365)	70.52	Durbin-Watson statistic	
P-value (F)	0.00	P-value (F)		0.00	P-value (F)	0.00	P-value (F)	

Notes: Dependable variables: Per-capita Consumption Expenditure.

A dash (-) refers to the situation where corresponding variables are dropped in the equations

Source: Computed on the basis of primary data collected during field survey

Table 4.3.8. Log-linear Regression Results of the Determinants of Per-capita Consumption Expenditure in Dhemaji and Sivasagar Districts (N=373)

Variables	Model-I			Model-II				
	<i>B</i>	<i>SEB</i>	<i>t-ratio</i>	p-value	<i>B</i>	<i>SEB</i>	<i>t-ratio</i>	p-value
Type of family	0.30	0.04	6.83	0.00	0.31	0.04	7.14	0.00
Size of household	-0.01	0.01	-1.45	0.15	-			
Dependency ratio	-0.00	0.00	-1.19	0.24	-			
Sex ratio	-0.00	0.00	-1.68	0.09	-0.00	0.00	-1.62	0.11
Age of HoH (years)	-0.00	0.00	-0.53	0.60	-			
No. of earners	0.15	0.03	4.57	0.00	0.14	0.03	4.30	0.00
Mean years schooling	0.02	0.01	2.99	0.00	0.03	0.01	3.05	0.00
Health index (BMI)	0.17	0.01	13.44	0.00	0.17	0.01	13.62	0.00
Physical assets (per household in Rs)	0.00	0.00	5.85	0.00	0.00	0.00	5.73	0.00
Landholding (per household in bigha)	0.04	0.02	2.08	0.04	0.05	0.02	2.53	0.01
Livestock (per household in Rs)	0.00	0.00	1.25	0.21	-			
Distance from nearest Urban	-0.01	0.00	-3.34	0.00	-0.01	0.00	-3.35	0.00
Flood dummy	-0.17	0.05	-3.82	0.00	-0.18	0.04	-4.11	0.00
Constant	3.62	0.32	11.17	0.00	3.42	0.31	10.98	0.00
R-square	0.82	0.82	Akaike criterion	0.81	R-square	0.82	Akaike criterion	0.81
Adjusted R ²	0.81	0.81	Hannan-Quinn	0.96	Adjusted R ²	0.81	Hannan-Quinn	0.92
Log-likelihood	-137.95	-137.95	Schwarz criterion	0.87	Log-likelihood	-141.18	Schwarz criterion	0.85
F(12, 360)	126.04	126.04	Durbin-Watson statistic	1.79	F(9, 363)	180.23	Durbin-Watson statistic	1.81
P-value (F)	0.00	0.00			P-value (F)	0.00		

Notes: Dependable variables: Log of Per-capita Consumption Expenditure.

A dash (-) refers to the situation where corresponding variables are dropped in the equations

Source: Computed on the basis of primary data collected during field survey

The table shows that per capita consumption is positively associated with the numbers of income earners in the household. One additional earner in the household would increase per capita consumption by 3 per cent. Similarly mean years of schooling of the members of the household plays a significant part in reducing poverty. The table shows that one more year in formal education increases the per capita consumption by 3 per cent.

Health Index (BMI) has a significant and positive effect on per capita consumption. The coefficient implies that 1 per cent increase in body mass of the household increase the per capita consumption by 17 per cent. Physical assets per household (Rs.) is positive and statistically significant on per capita consumption, i.e. physical assets has a positive relationship with per capita consumption. When other factors remain constant, a 1 per cent rise in physical assets increases per capita consumption at a positive amount. The distance of the household from nearest urban has a positive relationship with incidence of poverty. As other factors remain constant, a 1 per cent rise in distance from nearest urban increases the incidence of poverty by 1 per cent. Flood dummy has negative sign. It implies that if a household is affected by flood and erosion, it has negative impact on per capita consumption. From the empirical results, it is proved that socioeconomic as well as demographic variables have a significant impact on the consumption expenditure of households and on reduction of poverty incidence in Dhemaji and Sivasagar districts.

The Socio-economic Causes of Poverty among the Mishng Households in Dhemaji District

The ordinary least squares model was conducted to determine the best linear combination of fifteen independent variables, such as, age of the principal earner, size of the household, dependency ratio, sex ratio, mean years of schooling, health Index (based on 10 indicators), plinth area of the residence (per capita), sanitation dummy, distance of school from house, drinking water dummy, contribution of agriculture dummy, distance to nearest urban centre, flood dummy, main road connectivity with village, and policy dummy for predicting poverty. Two ordinary regressions models are employed. In these two models, per capita consumption

expenditure and poverty gap are used as dependent variables. The “R-Square” tells us that 98 per cent of the variation was explained, while the “Adjusted R-Square” shows that 98 per cent of the variance was explained. The model is significant at 1 per cent.

Table 4.3.9 shows that age of head of household, sex ratio, contribution from agriculture to total household income and distance of the village to urban centres are negatively associated with per capita consumption of the households. But these four variables are found to be insignificant in Dhemaji. On the other hand, size of the household, dependency ratio and flood dummy are statistically significant with negative signs. It means that an increase in these three variables reduces per capita consumption expenditure. Similarly, in case of six variables, such as health score based on 10 indicators, per-capita plinth area of the residence, sanitation facility, distance of school with 1 km, main road connectivity of the village with the urban area and enrollment in MGNREGA, it is found that these six variables are positively correlated with per capita consumption expenditure, but these are insignificant as determinants of poverty in Dhemaji district. On the other hand, mean years of schooling and drinking water dummy have positive sign and statistically significant. That is, an increase in these two variables raises per capita consumption expenditure.

The Socio-economic Causes of Poverty among the Mishing Households in Sivasagar District

As seen in Table 4.3.10, it is found that age of head of household, size of the household, sex ratio, contribution from agriculture, distance to nearest urban centre, and flood dummy were statistically significant with negative signs. It means that an increase in these variables reduces per capita consumption expenditure. On the other hand, health index, distance of school from house, drinking water dummy and main road connectivity with village have positive sign and statistically significant. That is, an increase in these four variables raises per capita consumption expenditure.

Table 4.3.9. The Regression Results - the Causes of Poverty in Dhemaji District (N= 67)

Variables	Model-I				Model-II			
	<i>B</i>	<i>SEB</i>	<i>t-ratio</i>	p-value	<i>B</i>	<i>SEB</i>	<i>t-ratio</i>	p-value
Age of the principal earner	-0.38	0.31	-1.23	0.22	-	-	-	-
Size of the household	-56.93	9.72	-5.86	0.00	-59.92	7.00	-8.56	0.00
Dependency ratio	-0.39	0.19	-2.04	0.05	-0.19	0.11	-1.68	0.10
Sex ratio	-0.13	0.09	-1.49	0.14	-	-	-	-
Mean years of schooling	17.27	3.58	4.82	0.00	14.63	2.93	5.00	0.00
Health index	89.55	84.77	1.06	0.30	-	-	-	-
Plinth area of the residence	0.87	3.38	0.26	0.80	-	-	-	-
Sanitation dummy	28.15	22.32	1.26	0.21	-	-	-	-
Distance of school from house	0.31	7.27	0.04	0.97	-	-	-	-
Drinking water dummy	46.39	20.04	2.32	0.02	20.90	9.96	2.10	0.04
Contribution of agriculture dummy	-28.51	16.96	-1.68	0.10	-	-	-	-
Distance to nearest urban centre	-0.15	0.36	-0.41	0.68	-	-	-	-
Flood dummy	-50.65	16.00	-3.17	0.00	-59.43	11.53	-5.15	0.00
Main road connectivity with village	14.70	15.16	0.97	0.34	-	-	-	-
Policy dummy	2.14	8.10	0.26	0.79	-	-	-	-
Constant	825.73	99.05	8.34	0.00	775.36	46.74	16.59	0.00
R-square			Akaike criterion		R-square		Akaike criterion	
	0.98	0.98	Hannan-Quinn	9.38	0.98	0.98	Hannan-Quinn	9.23
Adjusted R ²	0.98	0.98	Schwarz criterion	9.91	Adjusted R ²	0.98	Schwarz criterion	9.43
Log-likelihood	-298.19	-298.19	Durbin-Watson statistic	9.59	Log-likelihood	-303.37	Durbin-Watson statistic	9.31
F(15, 51)					F(5, 61)			
P-value (F)	0.00	0.00		1.46	P-value (F)	0.00		1.60

Notes: Dependable variables: Per capita consumption expenditure. A dash (-) refers to the situation where insignificant variables are dropped
Source: Computed on the basis of primary data collected during field survey

Table 4.3.10. The Regression Results -the Causes of Poverty in Sivasagar District (N=57)

Variables	Model-I				Model-II			
	B	SEB	t-ratio	p-value	B	SEB	t-ratio	p-value
Age of the principal earner	-0.32	0.19	-1.74	0.09	-0.33	0.17	-1.90	0.06
Size of the household	-4.23	1.54	-2.74	0.01	-3.25	1.29	-2.51	0.02
Dependency ratio	-0.02	0.03	-0.66	0.51	-			
Sex ratio (members)	-0.11	0.04	-2.93	0.01	-0.11	0.04	-2.98	0.00
Mean years of schooling	0.75	1.04	0.72	0.47	-			
Health index (based on 10 indicators)	11.943	3.350	3.57	0.00	129.29	31.82	4.06	0.00
Plinth area of the residence (per capita)	3.21	3.11	1.03	0.31	-			
Sanitation dummy	11.23	14.53	0.77	0.44	-			
Distance of school from house	16.32	7.75	2.11	0.04	19.47	6.95	2.80	0.01
Drinking water dummy	30.16	8.38	3.60	0.00	27.67	7.77	3.56	0.00
Contribution from agriculture Dummy	-28.65	14.52	-1.97	0.06	-24.50	9.20	-2.66	0.01
Distance to nearest urban centre	-9.45	1.21	-7.83	0.00	-9.26	1.14	-8.10	0.00
Flood dummy	-29.89	7.91	-3.78	0.00	-25.63	7.08	-3.62	0.00
Main road connectivity	28.84	11.94	2.42	0.02	29.18	8.55	3.41	0.00
Policy dummy	5.68	14.04	0.40	0.69	-			
Constant	812.83	40.44	20.10	0.00	774.47	27.48	28.18	0.00
R-square	0.97	Akaike criterion	8.63	R-square	0.97	Akaike criterion	8.51	
Adjusted R ²	0.96	Hannan-Quinn	9.20	Adjusted R ²	0.96	Hannan-Quinn	8.90	
Log-likelihood	-229.89	Schwarz criterion	8.85	Log-likelihood	-231.55	Schwarz criterion	8.66	
F(15, 41)	91.52	Durbin-Watson statistic	1.65	F(10, 46)	145.05	Durbin-Watson statistic	1.61	
P-value (F)	0.00	P-value (F)	0.00					

Notes: Dependable variables: Per capita consumption expenditure. A dash (-) refers to the situation where corresponding variables are dropped that are insignificant and multi-collinearity

Source: Computed on the basis of primary data collected during field survey

Table 4.3.11. The Regression Results -the Causes of Poverty in Dhemaji and Sivasagar Districts (N=124)

Variables	Model-I				Model-II			
	B	SEB	t-ratio	p-value	B	SEB	t-ratio	p-value
Age of the principal earner	-0.29	0.46	-0.62	0.54	-	-	-	-
Size of the household	-5.90	4.50	-1.31	0.19	-	-	-	-
Dependency ratio	-0.02	0.11	-0.21	0.83	-	-	-	-
Sex ratio (members)	-0.09	0.11	-0.87	0.39	-	-	-	-
Mean years of schooling	2.78	3.30	0.84	0.40	-	-	-	-
Health index (based on 10 indicators)	230.45	62.47	3.69	0.00	290.75	46.82	6.21	0.00
Plinth area of the residence (per capita)	8.33	6.77	1.23	0.22	-	-	-	-
Sanitation dummy	22.65	19.70	1.15	0.25	-	-	-	-
Distance of school from house	18.82	14.14	1.33	0.19	-	-	-	-
Drinking water dummy	40.41	19.64	2.06	0.04	54.17	19.00	2.85	0.01
Contribution from agriculture dummy	-40.52	25.32	-1.60	0.11	-23.83	21.72	-1.10	0.27
Distance to nearest urban centre	-3.68	0.75	-4.94	0.00	-3.97	0.70	-5.68	0.00
Flood dummy	-59.47	20.08	-2.96	0.00	-53.69	18.69	-2.87	0.00
Main road connectivity with village	130.80	18.39	7.11	0.00	143.47	14.22	10.09	0.00
Policy dummy	46.88	18.14	2.58	0.01	45.92	18.07	2.54	0.01
Constant	535.03	80.24	6.67	0.00	497.69	38.82	12.82	0.00
R-square	0.87	Akaike criterion	11.22	R-square	0.85	Akaike criterion	11.19	
Adjusted R2	0.85	Hannan-Quinn	11.59	Adjusted R2	0.84	Hannan-Quinn	11.38	
Log-likelihood	-679.93	Schwarz criterion	11.37	Log-likelihood	-686.08	Schwarz criterion	11.27	
F(15, 108)	47.01	Durbin-Watson statistic	1.20	F(7, 116)	96.41	Durbin-Watson statistic	1.31	
P-value (F)	0.00	P-value (F)	0.00					

Notes: Dependable variables: Per capita consumption expenditure

A dash (-) refers to the situation where corresponding insignificant variables are dropped

Source: Computed on the basis of primary data collected during field survey

The Socio-economic Causes of Poverty among the Mishing Households in Dhemaji and Sivasagar Districts

Table 4.3.11 displays regression results related to socio-economic causes of poverty among Mishing households in Dhemaji and Sivasagar districts. It is found that health index, drinking water dummy, distance to nearest urban centre, flood dummy, main road connectivity with village and policy dummy are statistically significant implying that these variables are the prime causes of poverty.

It is evident from the results that the variables inside the households that raise poverty are age of principal earner, size of the household, dependency ratio and sex ratio. The variables outside the household that raises poverty are distance to nearest urban centre, condition of area (affected by flood and erosion), and contribution of agriculture to household income. On the other hand, the variables inside the households that reduces poverty are mean years of schooling, health, and improved sanitation and the variables outside the household that reduces poverty are distance of school from house (if within one km), improved drinking water, main road connectivity with village and enrollment in MGNREGA. Hence, we can come to conclusion that the causes of poverty are beyond the control of household.

Table 4.3.12. Socio-economic Causes (Inside and Outside the Households) of Poverty		
Variables that Causes poverty		
	Raising Poverty (Positive Factors)	Reducing Poverty (Negative Factors)
Inside the household	<ul style="list-style-type: none"> • Age of principal earner • Size of the household • Dependency ratio • Sex ratio 	<ul style="list-style-type: none"> • Mean years of schooling • Health index • Improved sanitation facility
Outside the household	<ul style="list-style-type: none"> • Distance to nearest urban centre • Condition of area (flood) • Contribution of agriculture 	<ul style="list-style-type: none"> • Improved drinking water • Main road connectivity with village • Distance of school from house (within 1 km) • Enrollment in MGNREGA

Source: Computed on the basis of primary data collected during field survey

4.3.2 Results of Logit Model

Model of poverty is an important for the judgment of the poverty status of individual households. Firstly, we identify the poor and non-poor households based on their income or calorie or expenditure level. Secondly, we estimate the probability of being poor conditional on the logistic distribution function.

A logistic regression, an alternative econometric technique, is thus used to analyze the main determinants of poverty in terms of some qualitative and quantitative variables. In particular, the aim of the model is to determine the factors that explain the probability of being poor.

Logistic regression was conducted to assess whether the eight variables, (i.e., size of household, dependency ratio, sex ratio, mean years of schooling, occupation as agriculture and allied, health index, distance from town, and flood dummy) significantly predicted whether a person is poor or not.

In case of Dhemaji district, the table 4.3.13 depicts that the signs of the coefficients of size of household, dependency ratio, occupation as agriculture and allied, and distance from village to town are positive significant. It signifies that these variables positively affecting the probability of being poor. The dependency ratio and size of household are positive significant showing that probability of being poor is high in case of the large families with high dependents. On the other hand, the signs of the coefficients of occupations as agriculture and allied show that this variable are positively affecting the probability of being poor. The values of the coefficients of health of the households are negative and significant implying that sound health can reduce the poverty.

On the other hand, in Sivasagar district, it is evident that the probability of being poverty is high in case high size of household, high dependency ratio, high female-male ratio, occupation as agriculture and allied, remoteness or long distance from town to the village, and flood dummy or if the household is affected by flood (See table 4.3 14).

Table 4.3.13. Estimated Results of Binomial Logit Model of Poverty in Dhemaji District (N=181)

	Model -I				Model -II			
	B	S.E.	Exp(B)	Sig	B	S.E.	Exp(B)	Sig
Size of household	1.874	.462	6.514	.000	1.588	.383	4.893	.000
Dependency ratio	.022	.008	1.022	.004	.016	.006	1.016	.004
Sex ratio	-.022	.013	.978	.080	-	-	-	-
Mean years of schooling	-.668	.292	.513	.022	-.560	.229	.571	.014
Occupation as agriculture and allied	5.542	1.421	255.151	.000	5.111	1.273	165.900	.000
Health index	-5.478	1.841	.004	.003	-4.570	1.455	.010	.002
Distance from urban centre	.175	.069	1.191	.011	.111	.048	1.117	.021
Flood dummy	1.331	.996	3.785	.181	-	-	-	-
Constant	-10.253	3.079	.000	.001	-9.393	2.470	0.00	.000
	$\chi^2=199.739, df=8, N=181, p<.001$				$\chi^2=193.809, df=6, N=181, p<.001$			
	-2 Log likelihood				-2 Log likelihood			
	38.835				44.765			
	Cox & Snell R Square				Cox & Snell R Square			
	.668				.657			
	Nagelkerke R Square				Nagelkerke R Square			
	.913				.897			

Notes: Dependable variables: Poverty.

A dash (-) refers to the situation where insignificant and multi-collinear variables are dropped

Source: Computed on the basis of primary data collected during field survey

	Model -I						Model -II					
	B	S.E.	Exp(B)	Sig	B	S.E.	Exp(B)	Sig	B	S.E.	Exp(B)	Sig
Size of household	.075	.873	1.078	.932	.813	.273	2.255	.003				
Dependency ratio	.031	.044	1.031	.484	.022	.007	1.023	.003				
Sex ratio	.014	.017	1.014	.400	.022	.006	1.022	.001				
Mean years of schooling	-.084	1.074	.920	.938	-	-	-	-				
Occupation as agriculture and allied	3.787	5.117	44.110	.459	2.496	.983	12.136	.011				
Health index	-204.047	7540.002	.000	.978	-	-	-	-				
Distance from urban centre	.675	.537	1.963	.209	.353	.086	1.423	.000				
Flood affected dummy	22.287	904.791	4.775E9	.980	2.906	.882	18.276	.001				
Constant	68.574	3317.479	6.046E29	.984	-19.948	3.956	.000	.000				
	$\chi^2=224.170, df=8, N=192, p<.001$						$\chi^2=183.562, df=6, N=192, p<.001$					
	-2 Log likelihood						-2 Log likelihood					
	Cox & Snell R Square						Cox & Snell R Square					
	Nagelkerke R Square						Nagelkerke R Square					

Notes: Dependable variables: Poverty

A dash (-) refers to the situation where insignificant and multi-collinear variables are dropped

Source: Computed on the basis of primary data collected during field survey