Chapter Four

Results and Discussions

In this chapter the results obtained have been discussed in the light of relevant research in accordance with the objectives and hypotheses. This chapter presents the empirical findings of the study. It is divided into three sub-themes, namely, profile of the sample households (section 4.1), measurement of inequality (4.2) and econometric analysis of women workforce participation and quality of life (section 4.3).

4.1 Profile of the Sample Households

The Household is considered to be the basic unit in a society for social, economic, political and socialization purpose. The household refers to a group of persons living together and taking food from a common kitchen (NSSO, 2014). The household level data is the final statistical unit using for collection, measurement, presentation and analysis in this study. The best possible detailed observations and micro-level information about a tribe or group of people can only be found by actually surveying the household.

4.1.1 Demographic Characteristics

Demographic characteristics reflect the quality of human population and level of socio-economic development of any region. These attributes include like age composition, dependency ratio, gender composition, household size, sex composition, marital status have been analysed to know the socio-economic status of Tiwa households.

Age Composition of the Members of the Households

Members of the households are generally divided into three age-groups 0-14, 15-64 and 65 and above. The population in the age-group 15-64 years is considered as population of working age group. On the other hand, the total population of the age group 0-14 and 65 and above are considered as non-working population. The age composition of the members of the households is represented in table 4.1. In this study, the percentage share of working age group population (or 15-64 years) has been found as 62.82 per cent in Morigaon and 63.14

per cent in Nagaon. The percentage of young age population in the age group 0-14 years has been found as 33.00 per cent in Morigaon and 31.73 per cent in Nagaon district. This indicates a young age structure and growing population in the sample households. The percentage of elderly population is only 4.18 per cent in Morigaon and 5.13 per cent in Nagaon. This is an indicator of low life expectancy among the selected sample of Tiwas in the two districts.

Table 4.1: Age Composition of the Members of the Households

| District | Age Composition of the Households | | | Total |
	0-14 years	15-64 years	65 years and above	
Nagaon	297 (31.73)	591 (63.14)	48 (5.13)	936 (100)
Morigaon	521 (33.00)	992 (62.82)	66 (4.18)	1579 (100)
Overall	818 (32.52)	1583 (62.94)	114 (4.53)	2515 (100)

Figures in the parentheses indicate the percentages of the total.
Source: Computed on the basis of primary data collected from field survey.

Age composition by sex and broad age groups in the sample households is shown in table 4.2. It is observed that for most of the age groups, male-female differences in the age distribution of population are negligible except in the age-group of 36-50 and 71 and above.

Table 4.2: Distribution of all sample members by age

Age (Years)	Frequency (Male)	Percentage (Male)	Frequency (Female)	Percentage (Female)	Total
0-7	190	7.55	187	7.44	377
8-14	224	8.91	217	8.63	441
15-23	159	6.32	150	5.96	309
24-35	189	7.51	183	7.28	372
36-50	261	10.38	281	11.17	542
51-60	173	6.88	174	6.92	347
61-70	54	2.14	52	2.06	106
71 and above	14	0.60	7	0.24	21
Total	1264	50.26	1251	49.74	2515

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

In the age group 36-50, female population is about 0.79 per cent more than male, whereas in the age group 71 and above, percentage of male is 0.36 per cent more than female. The proportion of young children in the age group 0-7 and also the proportion of population in the age group 0-14 are higher for Male than Female. In the age-group 0-14, male population is

about 0.39 per cent more than female. Again in the age-group 15-60, male population is about 0.24 per cent more than female.

Gender Composition

Gender composition of Nagaon and Morigaon districts are shown in table 4.3. Total member covering 442 sampled households was 2515. This number was 936 in Nagaon district and 1579 in Morigaon district. Overall, the proportion of males was found to be almost equal (50.26 per cent) with females (49.74) in these two sample districts.

Table 4.3: Gender Composition

District	Male	Female	Total
Nagaon	471	465	936
	(50.32)	(49.68)	(100)
Morigaon	793	786	1579
	(50.22)	(49.78)	(100)
Overall	1264	1251	2515
	(50.26)	(49.74)	(100)

Figures in the parentheses indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

Dependency Ratio

In the present study, dependency ratio is defined as number of non-working member(s) or dependent(s) divided by number of working member(s) of the household multiplied by 100.

$$\text{Dependency ratio} = \frac{\text{Number of non-working member (s)}}{\text{Number of working member (s)}} \times 100$$

In this study, it is found that the overall dependency ratio was 346. The average dependency ratio among sample Tiwa households in Nagaon district was 320. In Morigaon it was 358, i.e. slightly higher. The overall average dependency ratio in these two districts was 346.

Household Size

The number of members of a household is its size (NSSO, 2014:8-9). Table 4.4 reveals that the household size of the sample Tiwa households in Nagaon and Morigaon districts were 6.00 ±2.23 and 5.78 ± 1.93 members respectively. The average household size among the sample Tiwa households in these two districts was found to be 5.69 persons.

Table 4.4: Household Size					
District	Total Number (N)	Maximum	Minimum	Mean	Standard Deviation (SD)
Nagaon	167	14.00	2.00	6.00	2.23
Morigaon	275	15.00	2.00	5.78	1.93
Overall	442	15.00	2.00	5.69	1.88

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

Sex Ratio

According to the Census of India, the sex ratio of Tiwa has improved from 985 in 2001 to 1000 in 2011. During the same period sex ratio among the ST population of Assam has improved from 972 to 985. Table 4.5 shows that the sex ratio on the basis of the present sample of Tiwa households in Nagaon is 991 and for Morigaon it is 987. The overall sex ratio of the selected sample households is 989. Thus, sex ratio found in this study is higher than the overall sex ratio of Nagaon (962) and Morigaon (967) and the overall sex ratio of the state (958) as per Census of India, 2011.

Table 4.5: Sex Ratio of the Members of the Tiwa Households	
District	Sex Ratio
Morigaon	991
Nagaon	987
Overall	989

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

Type of family

Out of the total sample households (442), the percentage of the nuclear family was higher (63.57 per cent) than the percentage of the joint family (36.43 per cent) as shown in table 4.6. The percentage of nuclear families in Nagaon district was found to be 62.28. The corresponding figure is 64.36 per cent in Morigaon district.

Table 4.6: Type of family			
District	Nuclear	Joint	Total
Nagaon	104 (62.28)	63 (37.72)	167 (100)
Morigaon	177 (64.36)	98 (35.64)	275 (100)
Overall	281 (63.57)	161 (36.43)	442 (100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

Marital status can potentially influence the demographic character and also the level of social well-being of the population in a region. In this present study, marital status of population includes single, married, widow and divorced or separated population in respect of both males and females. Table 4.7 shows marital status among the head of the households. Almost 92 per cent head of the households in the two districts were found to be married. Only 5.43 per cent, 2.49 per cent and 0.67 per cent respectively were found to be widowed, single and separated head of the households among sample Tiwa households of Morigaon and Nagaon districts of Assam.

Table 4.7: Marital Status among the Head of the Households

District	Single	Married	Widowed	Separated	Divorced	Total
Nagaon	4 (2.40)	153 (91.62)	9(5.38)	1 (0.60)	-	167 (100)
Morigaon	7 (2.55)	251 (91.27)	15(5.45)	2 (0.73)	-	275(100)
Overall	11 (2.49)	404 (91.40)	24 (5.43)	3 (0.67)	-	442 (100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

Table 4.8 indicates that percentage of single and married among the members of the households were almost 50 per cent in the two districts. No divorced member was found in the study.

Table 4.8: Marital Status among the Members of the Households

District	Single	Married	Divorced	Separated	Widowed	Total
Nagaon	446 (47.65)	473 (50.53)	-	2 (0.21)	15 (1.60)	936 (100)
Morigaon	777 (49.21)	781 (49.46)	-	3 (0.19)	18 (1.14)	1579 (100)
Overall	1223 (48.63)	1254 (49.86)	-	5 (0.20)	33 (1.31)	2515 (100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

4.1.2 Literacy and Educational Pattern

Literacy Rate

Literacy rate (LR) is defined as percentage of literates among the population aged seven years and above. According to 2011 census, average literacy rate of Tiwa is 73.01 per cent in which 80.01 per cent of males and 66.06 per cent of females reported as literate. During the same period literacy rate among the ST population of the state is 72.1 per cent where 78.6 per cent males and 68.2 per cent females are literate**.** Table 4.9 documents that 83.88 per cent males

and 61.09 per cent females in Morigaon and 85.77 per cent males and 65.85 per cent females are literate in Nagaon district.

Table 4.9: Literacy Rate of Sample Tiwa people by Sex

Sex	Morigaon	Nagaon	Overall
Male	83.88	85.77	84.44
Female	61. 90	65.85	63.08

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

Female literacy rate is not so satisfactory. It is noticed that in both the districts, literacy rate of males is significantly higher than that of females. As per census 2011, average literacy rate of Nagaon district was 80.41 compared to 74.47 (census, 2001). Table 4.10 shows that the effective literacy rates among the sample Tiwa people in Nagaon and Morigaon districts were 75.53 and 72.86 respectively.

Table 4.10: Literacy Rate

	Overall		All STs		Tiwa Tribe (7years and above)*
	2001[#]	2011[#]	2001[#]	2011[#]	
India	64.83	74.04	47.1	59.0	-
Assam	63.25	73.18	62.5	72.1	-
Nagaon	61.73	72.37	61.73	68.9	75.53
Morigaon	58.53	68.03	58.53	66.5	72.84

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

Educational levels of the Head of the Household

Table 4.11 gives the education levels of the head of the household and it reveals that the percentage of the illiterate head is 19.76 in Nagaon and corresponding percentage of illiterate head is 25.09 in Morigaon district.

Table 4.11: Educational Attainment of the Head of the Household

District	Illiterate	1-4th standard	5th-9th standard	10th Passed	12th Passed	Graduate	Post Graduate	Total
Nagaon	33	49	41	28	11	4	1	167
	(19.76)	(29.34)	(24.55)	(16.77)	(6.59)	(2.40)	(0.59)	(100)
Morigaon	69	82	63	35	17	7	2	275
	(25.09)	(29.82)	(22.91)	(12.73)	(6.18)	(2.55)	(0.72)	(100)
Overall	102	131	104	63	28	11	3	442
	(23.08)	(29.64)	(23.53)	(14.25)	(6.33)	(2.49)	(0.68)	(100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

Only 4 heads (2.40 percent) out of 167 in Nagaon district and 7(2.55 percent) out of 275 in Morigaon district are graduates. On the other hand, only 1 (0.59 percent) in Nagaon district and 2 (0.72 percent) in Morigaon district are post-graduates.

Educational levels of the Members of the Households

The education levels of the members of the households are presented in table 4.12. Out of the total sample members (2138) which are aged seven years and above in the two districts, a total of 559 (or 26.15 per cent) are found to be illiterate, 565 (33.14 per cent) are found to be educated up to primary level (1-4th Class), 344 (20.79 per cent) between 5th to 9th standard, 126 (or 7.61 per cent) between 10th to 12 standard, 120 (7.25 per cent) up to Higher Secondary. It also indicates that only 48 (2.90 per cent) are graduates and 18 (1.09) are post-graduates. From table 4.12 it clears that only 3.11 per cent graduates and 1.12 per cent post-graduates are found in Nagaon district and 2.33 per cent graduates and 0.82 per cent post-graduates are found in Morigaon district. It is evident that education beyond the 9th standard is still not popular among Tiwas of Morigaon and Nagaon districts of Assam.

District	Illiterate	1-4th Standard	5th-9th Standard	10th Passed	12th Passed	Graduate	Post Graduate	Total
Table 4.12: Educational Attainment of the Members of the Household								
Nagaon	197 (24.47)	257 (31.93)	204 (25.34)	58 (7.20)	55 (6.83)	25 (3.11)	9 (01.12)	805 (100)
Morigaon	362 (27.16)	488 (36.61)	301 (22.58)	68 (5.10)	72 (5.40)	31 (2.33)	11 (0.82)	1333 (100)
Overall	559 (26.15)	745 (34.85)	505 (23.62)	126 (5.89)	127 (5.94)	56 (2.62)	20 (0.93)	2138 (100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

4.1.3 Housing and Civic Amenities

Adequate housing provides protection against exposures to agents and vectors of communicable diseases, as also protection against avoidable injuries, poisonings, and thermal and other exposures that may contribute to chronic diseases and malignancies (WHO 1988).

Type of House

In this study, type of house is classified as per NSSO definition. According to NSSO, a pucca house is one, which has walls and roof made of wall material and roof material. Wall material includes brunt bricks, stones, cement concrete, timber, ekra etc. Roof material includes tiles, galvanised corrugated iron sheets, asbestos cement sheet, timber etc. On the other hand, if the walls and roof of which are made of material such as un-burnt bricks, bamboos, mud, grass, reeds, thatch, loosely packed stones, etc are treated as kutcha house. But a house that has fixed walls made up of pucca material but roof is made up of material other than those used for pucca house.

The NSSO household level survey data (NSSO, 2014:50) show that in Assam 26.6 per cent of houses are pucca-type (as compared to just 9.95 per cent for Tiwas found in the present study), 58 per cent are of semi-pucca type (47.51 per cent for Tiwas found in the present study) and 15.3 per cent houses are of kutcha type (as compared to 42.53 per cent for Tiwas found in the present study).

<table>
<tr><td colspan="5" align="center">**Table 4.13:** Type of House</td></tr>
<tr><td>District</td><td>Pucca</td><td>Semi-Pucca</td><td>Kutcha</td><td>Total</td></tr>
<tr><td>Nagaon</td><td>17
(10.18)</td><td>81
(48.50)</td><td>69
(41.32)</td><td>167
(100)</td></tr>
<tr><td>Morigaon</td><td>27
(9.82)</td><td>129
(46.90)</td><td>119
(43.27)</td><td>275
(100)</td></tr>
<tr><td>Overall</td><td>44
(9.95)</td><td>210
(47.51)</td><td>188
(42.53)</td><td>442
(100)</td></tr>
</table>

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. If the building consists of more than one structure, plinth level of the building will relate to the main (in the sense of having greater floor area) structure used for residential purpose. (NSSO, 2014:51). It was observed that overall, 81.38 per cent households had 4.72 feet plinth level of their dwelling unit and 19.62 per cent live in houses with 1.83 feet plinth levels.

Floor Area

The floor area of a house indicates the inside floor area of all living rooms, other rooms, covered and uncovered veranda excluding area covered by walls. (NSSO, 2014:55). Kitchen area has been kept outside the living area for those houses which have a separated and independent kitchen away from the living area. Table 4.14 shows that 49.7 per cent of the total the household has 0-20 square feet floor area of the dwelling units in Nagaon district and it is 54.91 per cent in Morigaon district. On the other hand, about 6.59 per cent households had 31-40 square feet floor area in Nagaon district and it is 4.73 per cent in Morigaon district. As low as 3.27 per cent the household has 41 and above square feet floor area of the dwelling units in Morigaon district, whereas, 3.59 per cent have 41 and above square feet floor area of the dwelling units in Nagaon district.

Table 4.14: Floor Area (square feet)

District	Floor area per square foot				Total
	0-20	21-30	31-40	41 and above	
Nagaon	83	67	11	6	167
	(49.7)	(40.12)	(6.59)	(3.59)	(100)
Morigaon	151	102	13	9	275
	(54.91)	(37.09)	(4.73)	(3.27)	(100)
Overall	240	170	12	14	442
	(54.30)	(38.46)	(4.07)	(3.17)	(100)

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 dwelling unit includes both living room and others, such as, kitchen, store-room, latrine, toilet, bath-room, veranda etc.

Table 4.15: Number of Rooms

District	1	2	3	4	5 and above	Total
Nagaon	4	19	108	29	7	167
	(2.40)	(11.38)	(64.67)	(17.36)	(4.19)	(100)
Morigaon	7	36	162	49	21	275
	(2.54)	(13.09)	(58.91)	(17.82)	(7.64)	(100)
Overall	11	55	270	78	28	442
	(2.49)	(12.44)	(61.09)	(17.65)	(6.33)	(100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

In this field study, a room considered as living room is that which is used for living purpose including kitchen and store-room (NSSO, 2014:9-10). Table 4.15 shows that as high as 64.67

per cent households had three rooms and 17.36 per cent households had four rooms in Naga-on district. About 4.19 per cent households in Nagaon district having five rooms and above. In Morigaon district, about 58.91 per cent had three rooms and 17.82 per cent households had four rooms. 7.64 per cent households in Morigaon district having five rooms and above.

Persons per Room

It refers to an indicator of the level of crowding in a private dwelling. A higher value of persons per room indicates a higher level of crowding. Table 4.16 represents persons per room among selected Tiwas of Morigaon and Nagaon districts of Assam. The findings of this study indicate that maximum 6 persons and minimum 0.50 people live in a room in Nagaon district and maximum 7 persons and minimum 1 person live in a room in Morigaon district. Average 3 persons live per room in these two districts (2.81 ± 1.27 persons per room in Nagaon and 3.04 ± 0.88 persons per room in Morigaon).

Table 4.16: Persons Per Room (Mean)

District	Total (N)	Maximum	Minimum	Mean	Standard Deviation
Nagaon	167	6.00	0.50	2.81	1.27
Morigaon	275	7.00	1.00	3.04	0.88
Overall	442	7.00	0.50	2.97	1.01

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

From table 4.17, it is evident that maximum households (48.64 per cent) live in rooms dwelling 03-04 persons per room in the two districts. On the other hand, overall 37.78 per cent households used to live in a room of 0-2 persons.

Table 4.17: Distribution of Number of Persons Per Room

District	Persons Per Room				Total
	0-2	03-04	05-06	07	
Nagaon	76	80	11	-	167
	(45.51)	(47.90)	(6.59)		(100)
Morigaon	91	135	47	2	275
	(33.09)	(49.09)	(17.09)	(0.73)	(100)
Overall	167	215	58	2	442
	(37.78)	(48.64)	(13.12)	(0.45)	(100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

It is also observed that as low as 0.45 per cent households used to live in room having 7 and above persons per room. It was observed that maximum households (13.12 per cent) live in rooms dwelling 05-06 persons per room in the two districts.

Floor Structure

The floor structure of a house has been divided into three categories: soil, RCC, and bamboo and wooden. Table 4.18 indicates that 58.68 per cent of Nagaon and 62.18 per cent of Morigaon district was made up of bamboo and wooden; whereas, 22.16 per cent households in Nagaon and 17.09 per cent households in Morigaon district have RCC floor and 19.16 per cent households in Nagaon and 20.73 per cent households in Morigaon district have mud floor.

Table 4.18: Floor Structure

District	Floor made up of			Total
	Mud	RCC	Bamboo and Wooden	
Nagaon	32	37	98	167
	(19.16)	(22.16)	(58.68)	(100)
Morigaon	57	47	171	275
	(20.73)	(17.09)	(62.18)	(100)
Overall	89	84	269	442
	(20.14)	(19.00)	(60.86)	(100)

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 standard of living that influence economic condition of rural people. It was observed that 62.3 per cent and 16.7 per cent of households did not have any safe sanitation in rural and urban India respectively. In Assam, 45.6 per cent and 9.2 per cent 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 per cent households had attached bathroom and 98.8 per cent had separate bathrooms among the Tiwa tribe of Nagaon and Morigaon districts, while 35.3 per cent households did 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". As per NSSO survey of India, the sanitation facility among the households is of four categories: Pucca, Semi-Pucca, Kutcha and Open/outside. It is found from table 4.19 that about 31.74 per cent of the households still had no sanitation facility in Nagaon, whereas the corresponding figure was 31.27 per cent in Morigaon district.

Table 4.19: Sanitation Facility

District	Sanitation facility				Total
	Pucca	Semi-Pucca	Kutcha	Open/outside	
Nagaon	21 (12.57)	47 (28.14)	46 (27.54)	53 (31.74)	167 (100)
Morigaon	32 (11.64)	77 (28.00)	80 (29.09)	86 (31.27)	275 (100)
Overall	53 (11.99)	124 (28.05)	126 (28.51)	139 (31.44)	442 (100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

A household is considered to have access to safe sanitation if it has some type of flush toilet or latrine, connection to a piped sewer system or connection to a septic system or ventilated improved pit or composting toilet, provided that they are not shared (according to the MDG guidelines). It can be seen from table 4.20 that only 12.03 per cent households with cultivation, 7.48 per cent agricultural labour households and 6.28 per cent non-agricultural labour households have the safe sanitation facility in comparison to 51.1 per cent households with self-employed and 67.01 per cent households with service. Across occupations, 40.04 per cent selected sample households have safe sanitation facility, while 59.96 per cent households still don't have sanitation facility.

Table 4.20: Accessibility to safe Sanitation Facility

Safe Sanitation	Cultivation	Agricultural Labour	Non-agricultural Labour	Self-employed	Service	Across Occupations
Available	12.03	7.48	6.28	51.1	67.01	40.04
Not Available	87.97	92.52	93.72	49.9	22.99	59.96

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

Principal source of Drinking water

Water is the most important one among all essential commodities. In this present study, we consider six sources of drinking water: Tap, Well, Hand-pump, Tube-well, River/Pond and others. According to this study, as high as 73.65 per cent in Nagaon district and 69.82 per cent in Morigaon district have tube well, whereas only 5.99 per cent in Nagaon and 5.45per cent in Morigaon use tap as a source of drinking water. The percentage of households using hand pump as a source of drinking water is 9.58 per cent in Nagaon and 8.73 per cent in Morigaon district. 2.40 per cent in Nagaon and 4.36 per cent in Morigaon district use well, while 7.78 per cent in Nagaon and 10.91 per cent in Nagaon use river or pond as their source of drinking water. Table 4.21 reveals that overall the highest 71.27 per cent households use tube-well as source of drinking water.

Table 4.21: Sources of Drinking Water

| District | Source of Drinking water | | | | | | Total |
	Tap	Well	Hand-pump	Tube-well	River/pond	Others	
Nagaon	10	4	16	123	13	1	167
	(5.99)	(2.40)	(9.58)	(73.65)	(7.78)	(0.60)	(100)
Morigaon	15	12	24	192	30	2	275
	(5.45)	(4.36)	(8.73)	(69.82)	(10.91)	(0.73)	(100)
Overall	25	16	40	315	43	3	442
	(5.66)	(3.62)	(9.05)	(71.27)	(9.73)	(0.67)	(100.00)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

The WHO / UNICEF Joint Monitoring Programme (JMP) 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.

Table 4.22: Improved and Unimproved Source of Drinking Water

District	Improved Source	Unimproved Source	Total
Nagaon	149	18	167
	(89.22)	(10.78)	(100)
Morigaon	232	43	275
	(84.36)	(15.64)	(100)
Overall	381	61	442
	(86.20)	(13.80)	(100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

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 4.22 reveals that overall 86.20 per cent households use improved source of drinking water.

Accessibility of Drinking Water within and across different Occupations

Table 4.23 depicts the main source of drinking water within the premises, near and away from the premises for selected Tiwa households in Nagaon and Morigaon districts. Around 29 per cent of sampled Tiwa households by occupation cultivation, agricultural labour and non-agricultural labour have drinking water available within their premises in comparison to 85.6 per cent self-employed households and 92.4 per cent households with service. The suffering of Tiwa households is highlighted with 22.6 per cent of cultivator, 25.9 per cent of agricultural labour and 27.7 per cent of non-agricultural labour having availability of drinking water away from their premises compared to just 3.8 per cent for self-employed households and 1 per cent households with service. On the whole, 52.86 per cent households have drinking water available within their premises in comparison to 34.94 per cent have drinking water available near their premises, and 16.2 per cent away from their premises.

Table 4.23: Accessibility of Drinking Water Within and Across Different Occupations

Area	Cultivation	Agricultural Labour	Non-agricultural Labour	Self-employed	Service	Across Occupations
Within Premises	29.1	28.5	28.7	85.6	92.4	52.86
Near Premises	48.3	45.6	43.6	10.6	6.6	30.94
Away	22.6	25.9	27.7	3.8	1.0	16.2

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

It can be seen from table 4.24 that about 84.17 per cent agricultural households, 79.5 per cent agricultural labour households and 79.34 per cent non-agricultural labour households have the pure source of drinking water in comparison to 92.34 per cent self-employed households and 95.84 per cent households with service. Across occupations, 86.24 per cent selected

sampled Tiwa households have pure source of drinking water, while 13.76 per cent households still don't have pure drinking water sources.

Table 4.24: Availability of Pure Source of Drinking Water

Pure	Cultivation	Agricultural Labour	Non-agricultural Labour	Self-employed	Service	Across Occupations
YES	84.17	79.5	79.34	92.34	95.84	86.24
NO	15.83	20.5	20.66	7.66	4.16	13.76
Total	100	100	100	100	100	100

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

Distance to Principal Source of Water

Here 'within premises' includes both 'within dwelling' and 'outside dwelling but within premises'. In India, about 46.1 per cent rural households receive drinking water within premises compared to 76.8 per cent urban households. As many as 50.2 per cent rural households and 21.1 per cent urban households have 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). About 52.86 per cent Tiwa households got drinking water *within premises*. This figure is better than the figure for rural India (46.1 per cent) and lower than the figure for rural Assam (79.1 per cent).

Electrification of Houses

Table 4.25 presents the percentage of houses under electricity connection among selected Tiwas of Morigaon and Nagaon districts of Assam.

Table 4.25: Percentage of Households under Electricity Connection

District	Availability of electricity		Total
	Yes	No	
Nagaon	81	86	167
	(48.50)	(51.50)	(100)
Morigaon	114	161	275
	(41.45)	(58.55)	(100)
Overall	195	247	442
	(44.12)	(55.88)	(100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

A total of 247 households representing 55.88 per cent of total households do not have electricity connection in their houses, whereas, 195 households representing 44.12 per cent of households are living with the facility of electricity.

Type of Fuel Used for Cooking

The data related to different types of fuel used for cooking summarized in the table 4.26 revealed that most of the households (63.80 per cent) used wood for domestic cooking and very few (17.65 per cent) use gas (LPG). The table exhibits that both wood and gas were used fuel only by 16.74 per cent of total respondents. About 1.81 per cent use kerosene. Since use of timber is very popular it is indicative of deforestation and needs to be dealt by policy makers, planners and leaders.

District	Type of Fuel used for Cooking				Total
	Wood	Kerosene	Gas (LPG)	Woods and Gas	
Nagaon	103	03	39	22	167
	(61.68)	(1.80)	(23.35)	(13.17)	(100)
Morigaon	179	05	39	52	275
	(65.09)	(1.82)	(14.18)	(18.91)	(100)
Overall	314	03	78	71	442
	(63.80)	(1.81)	(17.65)	(16.74)	(100)

Table 4.26: Type of Fuel used for Cooking

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

The over dependence on wood is clear from the first column of table 4.26. Moreover LPG penetration is limited to below 24 per cent in Nagaon and below 15 per cent in Morigaon which is another indicator of preference for traditional through greater economic empowerment or through urbanisation or both.

Type of Road

The results in table 4.27 show that as high as 43.44 per cent of total road is made up of sand and stone in Nagaon district, whereas 35.25 per cent of total road is made up of soil. In Morigaon district, 42.55 per cent road is found as made up of sand and stone and 37.09 per cent road is made up of soil.

Table 4.27: Road Connectivity to the Sample Villages				
District	Type of Road			Total
	Soil	Sand and stone	Metalled/Pitch	
Nagaon	63	65	39	167
	(35.25)	(43.44)	(21.31)	(100)
Morigaon	102	117	56	275
	(37.09)	(42.55)	(20.36)	(100)
Overall	165	182	95	442
	(37.33)	(41.18)	(21.49)	(100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

About 21.31 per cent road are metalled and pitch in Nagaon while the same is only 20.36 per cent in Morigaon district. So, roads connecting Tiwa villages are mostly non-metallic/pitch. In other words, motorable roads in Tiwa dominated areas are for limited compared urban centres of Assam

4.1.4. Occupational Distribution

The present occupational patterns among Tiwa people help to understand their socio-economic conditions, levels of development and urbanisation, and also their quality of life to an extent. The Occupation or livelihood of a household is defined on the basis of the sources of the household's income during the reference period of 365 days preceding the date of survey. So, only the income from economically gainful activities by household members is considered in the present study. There may be multiple earners in a household and there may be occupational diversification. But, for the sake of convenience, if there are multiple earners, the highest earner is considered as principal earner of the household. Depending on the occupation of the principal earner of the household, this study has categorised households under the following five occupations. These are,

   i) Cultivator: An individual (household member) currently engaged in agriculture (farming) and is either cultivating his own land, or is cultivating under tenancy, where area cultivated is owned by someone else (land owner). In other words, farm households where principal earners are owner cultivators or tenants, fall under the category of *cultivator households*.

   ii) Agricultural labourer: An individual whose principal earning is derived from agricultural wages is known as an agricultural labourer (Agricultural Labour Enquiry

Committee, 1956). In other words, a person works on land owned and/or cultivated by some other person for wages in money or kind (or share) is regarded as an agricultural labourer. He or she has no risk in the cultivation, but merely works on another person's land for daily wages. An agricultural labourer has no right of lease or contract. The present study has found mainly agricultural labourers working as farming, dairy farming and also in raising of livestock. Finally, households where principal earners are daily wage earners in agricultural activities fall under the category of *agricultural labour households*.

iii) Non-agricultural labourer: A person whose principal income is derived from daily wage earning from non-farm activities is considered for the present study as a non-agricultural labourer. Examples of Tiwas working as skilled or semi-skilled workers include those in traditional handlooms for preparation of Tiwa garments, cane and bamboo products, unskilled technician working in electronic shop, all types of construction workers, among many others. Finally, households where principal earners are daily wage earners in non-farm sector and are earning primarily from non-farm activities fall under the category of *non-agricultural labour households*.

iv) Self-employed: A person whose principal earning is by virtue of his/her own non-farm enterprises, where he/she is engaged independently in a profession or trade on own account, or with one or a few partners, is defined as self-employed in the present study. The essential features of self-employed (businesses) are that they have autonomy and economic independence for carrying out operation (NSSO, 2011). The income of this occupation is determined wholly or mainly by sales or profits of the goods and services which are produced. In the present study shop owner, home based food production business, persons engaged in dairy farming, duckery and poultry farming, weaving and embroidery are included as self-employed. Some dentists and lawyers not in government sector have also included under this occupation. A household where the principal earner is self-employed is categorised as a *self-employed household*.

v) Service: A person is said to be engaged in service in the present study if he/she is a regular/part-time salaried employee under some private agency/enterprise or some

government agency/enterprise in the non-farm sector farm enterprises and is receiving a salary in return which is not on the basis of daily or periodic renewal work contract (NSSO, 2011). This clearly includes people who are employees of any local, state, or central governmental unit or in any company. This occupation has regular and secured level of income. A household where the principal earner is engaged in service is categorised as a service household in the present study.

Occupation wise percentage distribution of principal earner of the households of this study is shown in table 4.28. An overwhelming majority (37.45) of principal earner of households in Morigaon district is found pursuing cultivation as prime occupation. This is more than that of Nagaon district (30.53 per cent). In Nagaon district, 26.35 per cent principal earner are found working as agricultural labour followed by 16.17 per cent in service, 13.78 per cent are working as non-agricultural labour and 13.17 per cent are self-employed. In Morigaon district, 22.90 per cent principal earners are working as agricultural labour, followed by 16.00 per cent in service. Again, 13.82 per cent are working as non-agricultural labour and only 9.82 per cent principal earner of the households are self-employed. Overall, 34.84 per cent principal earner's prime occupation is cultivation followed by 24.21 per cent agricultural labour, 16.06 per cent are in service, 13.8 per cent are working as non-agricultural labour and only 11.09 per cent principal earner of the households are self-employed.

Table 4. 28: Percentage Distribution of Principal Earner of the Households by Occupation

Occupation	Nagaon	Morigaon	Overall
Cultivation	51 (30.53)	103 (37.45)	154 (34.84)
Agriculture Labour	44 (26.35)	63 (22.90)	107 (24.21)
Non-agriculture Labour	23 (13.78)	38 (13.82)	61 (13.8)
Self-employed	22 (13.17)	27 (9.82)	49 (11.09)
Service	27 (16.17)	44 (16.00)	71 (16.06)
Overall	167 (100)	275 (100)	442 (100.0)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

Thus almost 60 per cent of the principal earners (or even households) are engaged in agriculture and allied activities. This is indicative of a traditional farm based community which is still under a rural influence and is largely under the domain of the rural informal sector. Hence the occupational distribution is suggestive of a very limited degree of urbanisation or modernisation among Tiwas.

Work Participation Rate

The Work Participation Rate (WPR) is the proportion of people eligible to participate in the work force that are actually participating in it, by working or by looking for work. Table 4.29 shows the distribution of population into total worker and total non-worker (Census of India, 2011).The work participation rate is 48.71 per cent for all STs of India, whereas in Assam it is comparatively lower at 43.99 per cent. The WPR is 45.17 per cent in Morigaon district which is above the WPR of Assam while the same is 43.94 per cent in Nagaon which is below the WPR of Assam. Table-4.28 also shows the composition of main and marginal workers of STs. As per census of India definition, main workers were those who had worked for the major part of the year preceding the date of enumeration i.e., those who were engaged in any economically productive activity for 183 days (or six months) or more during the year. On the other hand, marginal workers were those who worked any time at all in the year preceding the enumeration but did not work for a major part of the year, i.e., those who worked for less than 183 days (or six months).

Table 4.29: Distribution of Work Participation Rate (WWP) and Composition of Main and Marginal Workers of STs

		WPR			Main Worker			Marginal Worker		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
All STs of India	TOTAL	53.87	43.51	48.71	74.52	52.67	64.81	25.48	47.33	35.19
	RURAL	54.31	24.26	50.00	73.33	51.44	63.39	26.67	48.56	36.61
	URBAN	49.84	45.64	37.18	86.13	73.53	82.06	13.87	26.47	17.94
All STs of Assam	TOTAL	53.05	34.78	43.99	79.86	44.30	65.91	20.14	55.70	34.09
	RURAL	53.25	35.68	44.54	79.38	43.44	65.09	20.62	56.56	34.91
	URBAN	49.65	19.71	34.71	88.52	70.22	83.34	11.48	29.78	16.76
STs of Morigaon	TOTAL	56.13	34.21	45.17	81.65	36.82	64.67	18.35	63.18	35.33
	RURAL	56.25	35.12	45.68	81.65	36.68	64.36	18.35	63.32	35.64
	URBAN	53.62	15.19	34.41	81.62	43.55	73.22	18.38	56.45	26.78
STs of Nagaon	TOTAL	56.24	31.57	43.94	78.94	35.60	63.61	21.06	64.40	36.29
	RURAL	56.24	31.57	43.94	78.72	35.14	63.11	21.28	64.86	36.89
	URBAN	55.34	18.72	37.24	83.22	50.87	75.18	16.78	49.13	24.82

Source: Census of India, 2011.

Among all total workers of Assam under ST category, 65.91 per cent are main workers and this proportion is marginally above the national average recorded for all tribals, 64.81 per cent. In particular 64.67 per cent of all ST workers in Morigaon are main workers, whereas the corresponding figure for Nagaon is 63.61 per cent. In rural areas of Morigaon district, male and female participation rates are 56.25 per cent and 35.12 per cent respectively, the corresponding figure for Nagaon being 56.24 per cent and 31.57 per cent respectively. In urban areas of Morigaon district, male and female participation rates are 53.62 per cent and 15.19 per cent respectively, the corresponding figure for Nagaon being 55.84 per cent and 15.19 per cent respectively. The percentage of urban female main worker is considerably lower compared to male counterpart in the surveyed districts. The situation is even worse in rural areas where only 36.68 per cent of total worker are female main workers in Morigaon, the corresponding figure for Nagaon being 35.14 per cent. In contrast, 81.65 per cent of total workers are male main workers in Morigaon district, the corresponding figure for Nagaon being 78.72. This implies that female workers are mostly engaged in unorganised sector while the situation is drastically different for male workers, where around 80 per cent are engaged as main workers and as casual labours. But the percentage of main female worker is everywhere higher compared to their counterpart in rural area. It reflects the rural fact of unremunerative economic activities where most of our tribal workforce is toiling hard to earn for their family.

Workforce Participation Rate among Tiwas

The present study has used census of India definition to distinguish main workers from marginal workers. Main workers were those who had worked for the major part of the year preceding the date of enumeration i.e., those who were engaged in any economically productive activity for 183 days (or six months) or more during the year. On the other hand, marginal workers were those who worked any time at all in the year preceding the enumeration but did not work for a major part of the year, i.e., those who worked for less than 183 days (or six months).

Table 4.30: Distribution of Work Participation Rate (WWP) and Composition of Main and Marginal Workers among Sample Tiwas

District	WPR			Main Worker			Marginal Worker		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Morigaon	60.87	37.94	49.49	76.67	30.23	59.0	23.33	69.77	41.0
Nagaon	63.64	30.37	47.48	74.72	31.71	61.36	25.28	68.29	38.64
Overall	61.68	35.79	48.91	76.08	30.59	59.66	23.92	69.41	40.34

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

The percentage distribution of male-female participation to total work participation as main and marginal workers in the selected districts is presented in table 4.30. Workforce participation rate is 49.49 per cent in Morigaon district and 47.48 per cent in Nagaon district. The female workforce participation rate is 37.94 per cent in Morigaon and 30.37 per cent in Nagaon. About 76.67 per cent of male and 30.23 per cent of female in Morigaon district and 74.72 per cent of male and 31.71 per cent of female in Nagaon district are main workers. Thus around 70 per cent female workers are engaged in marginal works. It is socio-economically significant and as high as 69.77 per cent in Morigaon district and 68.29 per cent in Nagaon district. In other words, almost 70 per cent of the female Tiwa members are either actively working or are on the lookout for low skill jobs.

Table 4.31: Block wise Percentage Distribution of Occupations by Sex

Block (District)	Sex	Cultivation	Agricultural Labour	Non-agricultural Labour	Service	Self-employed
Lahorighat (Morigaon)	Male	53.13	14.82	10.25	16.2	5.6
	Female	50.57	13.68	11.35	16.3	7.1
Bhurbondha (Morigaon)	Male	50.11	13.95	11.28	17.53	7.13
	Female	51.12	14.33	14.33	15.32	4.9
Mayong (Morigaon)	Male	51.5	13.82	12.25	16.3	6.13
	Female	49.24	16.15	13.31	16.1	5.2
Kapili (Morigaon)	Male	50.85	15.95	12	15.8	5.4
	Female	52.88	15.45	12.24	14.13	5.3
Udali (Nagaon)	Male	53.01	14.25	11.31	15.3	6.13
	Female	50.85	15.5	11.05	16.9	5.7
Raha (Nagaon)	Male	49.26	16.34	12.9	15.4	6.3
	Female	47.45	16.7	12.75	14.4	5.7
Kathiatoli (Nagaon)	Male	51.12	14.23	11.05	17.5	6.1
	Female	46.04	18.12	12.44	17.1	6.3

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

Table 4.31 shows the occupational status in all different blocks of the two surveyed districts. In almost all blocks, agriculture is the dominant occupation of Tiwa people. This is observed for both male and female in the study area. Tiwa people mainly depend on agriculture and its related works. Compared to non-agricultural labour, in all blocks we have seen more Tiwa

people worked as agricultural labour. Although a large proportion of Tiwa tribe, both males and females are actively engaged in cultivation and agricultural labour and non-agriculture labour, yet their participation in different public sector job is no less significant. Proportion of male workers in this sector is highest in Mayong at 17.53 and is lowest in Udali at 15.3. It is encouraging to note the proportion of Tiwa women workers engaged in different government and private jobs. The female participation in service is highest in Raha at 17.1 per cent and is lowest in Kapili at 14.13 per cent. The educational advancement in recent time in general and the provision of job reservation among the tribal in particular have opened avenues for them to go for different types of jobs throughout the state.

Occupational Structure of Tiwa Female Workers

The study of occupational structure of females is important in order to know the actual level of social and economic development of any region. The distribution of female workers among different occupations differs in different regions or countries depending upon the condition of the economy, education levels, attitudes of females to participate in earning activities, social factors etc. The present study is also made an attempt to study the occupational structure of Tiwa female workers. Table 4.32 shows the occupational structure of Tiwa female workers among selected Tiwas of Morigaon and Nagaon districts of Assam. It is observed that the proportion of female workers engaged in cultivation among Tiwa tribe is higher in Morigaon which is 32.04 per cent, as against the percentage figure of 30.21 in Nagaon district. But in regard to female workers participation as agricultural labour and non-agricultural labour, it is at 25.58 per cent and 17.11 per cent respectively in Morigaon as compared to 25.55 per cent and 17.27 per cent respectively in Nagaon district.

Table 4.32: Percentage Distribution of Tiwa Woman by Occupation

Occupation	Morigaon	Nagaon	Overall
Cultivation	32.04	30.21	31.13
Agricultural Labour	25.58	25.55	25.57
Non agricultural Labour	17.11	17.27	17.19
Self-employed	13.23	14.06	13.65
Service	11.94	12.23	12.09
Total	100	100	99.63

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

Women participation is more visible in unorganised occupations as 74.73 per cent women are engaged in cultivation and labour works in Morigaon district and 73.03 per cent in Nagaon district. It is indicative of the fact that the women workers' participation in both the districts are mostly in unorganised sector and so they are not earning well compared to the time they spent in their activities. It is an important fact that out of all working women, only 11.94 per cent in Morigaon district and 12.23 per cent in Nagaon district are in service. Similarly the proportions of self-employment in the two districts are at 13.23 per cent and 14.06 per cent in Morigaon and Nagaon districts respectively. Out of total working women, 31.13 per cent work in cultivation, 25.57 per cent work as agricultural labour, 17.19 per cent work as non-agricultural labour whereas 13.65 per cent work as self-employed and only 12.09 per cent work in service. The findings indicate that only around 25 per cent are engaged either in service or as self-employed.

Employment Status of Women by Occupation

The level of education and women work participation is shown in table 4.33. It is observed that in this study total 215 women are engaged in economically earning activities including self-employment. The results indicate that about 46.04 per cent of Tiwa women workers are illiterate. Among illiterate workers, the highest 17.21 per cent work as agricultural labour and 11.63 per cent work as non-agricultural labour. About 15.81 per cent women workers are engaged in cultivation. Only 1.39 per cent illiterate women are self-employed. Thus, the illiterate Tiwa women workers are distributed almost equally among the three occupational groups-cultivation, agricultural labour and non-agricultural labour. Neither illiterate nor primary level educated Tiwa women found employment in organised sector. About 9.3 per cent primary level educated women are engaged in cultivation against 1.39 per cent of self-employed. Out of 22.32 per cent primary level educated working women in the two districts, 6.98 per cent women are found working as agricultural labour and 4.65 per cent work as non-agriculture labour. About 9.30 per cent working women have middle school level education and out of them, 3.72 per cent engaged in cultivation, 2.33 per cent as self-employed, 1.39 per cent as agricultural labour and 0.93 per cent as non-agricultural labour. About 0.93 per cent middle school educated women are in service.

Table 4.33: Employment of Women across Different Occupations by Level of Education

Occupation	Illiteracy	1-4th Class	5th-9th Class	10th Passed	12th Passed	Graduate	Post Graduate	Total
				Qualification				
Cultivation	34 (15.81)	20 (9.3)	8 (3.72)	5 (2.33)	–	–	–	67 (31.16)
Agricultural Labour	37 (17.21)	15 (6.98)	3 (1.39)	–	–	–	–	55 (25.58)
Non-agricultural Labour	25 (11.63)	10 (4.65)	2 (0.93)	–	–	–	–	37 (17.21)
Self-employed	3 (1.39)	3 (1.39)	5 (2.33)	4 (1.87)	3 (1.39)	5 (2.33)	7 (3.26)	30 (13.96)
Service	–	–	2 (0.93)	3 (1.39)	6 (2.79)	7 (3.26)	8 (3.72)	26 (12.09)
Total	99 (46.04)	48 (22.32)	20 (9.30)	7 (3.26)	9 (4.18)	12 (5.59)	15 (6.98)	215 (100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

Out of 6.98 per cent working 10th passed women of the present study, 2.33 per cent women are engaged in cultivation, 1.86 per cent as self-employed and 1.39 per cent in service. Thus, it is evident that around 31.16 per cent women engaged in cultivation, 25.58 per cent engaged as agricultural labour and 17.21 per cent engaged as non-agricultural labour. Thus, around 73 per cent engaged in these three informal occupations where almost 72 per cent are below 10th passed. It reveals that as the level of education increases, the participation of women shifted from agricultural and allied activities to non-agricultural and salaried jobs. It is clear that educated women do not want to engage themselves in any unorganised sector which is expected. Because educated men or women do not want engage themselves in farming or any other daily wage works.

The results represent in table 4.33 indicate that out of 5.59 per cent graduate working women, 2.33 per cent are self-employed and 3.26 per cent in service. About 3.26 per cent post-graduate women are self-employed. Similarly, 3.72 per cent post-graduate women are in service.

Occupational Sustainability

During the field survey, I asked across occupations that 'Would you like your kids to stay in the present occupation you are in?' Across blocks, the answer came from parents and principle earners engaged in farming and other agricultural and non-agricultural works had hardly ever been 'Yes'. Though agriculture is the dominant sector in terms of livelihood among Tiwas, most of the young Tiwa people that I interviewed during the field survey do not aspire to continue their parents' farming.

The study has also observed a trend in young people, towards exiting agriculture. This is prevalent across all sizes of landholdings, but with different motivations. Those with lower access to land are being pushed out of the sector while those with larger landholdings are capitalizing on their relatively higher education and skills levels to exploit opportunities in other sectors. Young people remaining in farming often want to do so because their opportunities are limited by lack of skills or capital.

A further observation from this research is also that the aspirations of young people participating in this study are echoed in their parents' own hopes for them. Table 4.34 reports the percentage distribution about the present generation's desire to continue their older generation's occupation.

Table 4.34: Percentage Distribution of Occupational Sustainability of Sampled Tiwa Households

Occupation	Wants to continue	Doesn't want to continue	Doesn't Know
Cultivation	12.37	81.4	6.18
Agricultural Labour	10.48	81.90	7.62
Non-agricultural Labour	11.48	80.32	8.20
Self-employed	90.23	2.13	7.64
Service	96.83	1.78	1.39

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

Thus it is evident that second generation belongs to households whose prime occupations are cultivation and agricultural and non-agricultural labour; around 80 per cent of them don't wish to continue their family's occupation. So occupational sustainability is not found among them.

4.1.5 Income Distribution Pattern

Income distribution pattern shows the condition of the people. The major advantage of using income distribution pattern is to examine the sources of livelihood to identify the way in which these sources are related to income and inequality. Income levels of households are associated with the availability of work, the productivity of land, and individual human capital. Consumption levels are affected by household composition. From income and its sources we know not merely the level of a household's standard of living but also how it achieved that level and thus we obtain a better understanding of why most of the tribal people are living in poor economic condition. Tribal economy is mainly agricultural economy. Tiwa people are also not an exception. But fortunately due to some expansion of education and the reservation policy of the government, they are now getting opportunity to enter into different jobs on the basis of their level of education. From table 4.35, it clears that households with service dominate the higher income categories, because income earned from service is more reliable and more generous, as this income is regular. In this study, about 16.28 per cent households receive wage and salary income engaged in service. This accounts for major share of 43.41 per cent of all sampled income. According to the findings of the present study, by far the most remunerative occupation is service, as opposed to households with agricultural and non-agricultural labour. Besides wages and salaries earned from service, some households derive their income through self-employment though the percentage of self-employed as prime occupation is just 10.63 per cent of the selected households. These households are fairly earning as this is also rewarding. The income earned through self-employment accounts for 18.86 per cent of all income.

In contrast, both agricultural and non-agricultural households account for a relatively small portion of total household incomes because the wages they get are very low. Again, their earnings are also not as certain as in service. About 23.76 per cent selected households under this study are engaged as agricultural labour but this work tends to be seasonal and the income accounts for only 11.99 per cent of total household incomes. Similarly, 13.80 per cent of selected households engage in non-agricultural work, but it accounts for only 6.88 per cent of total sampled incomes. Major proportion of our sampled households have found as cultiva-

tor households. About 35.52 per cent of selected Tiwa households are engaged in this occupation. However, the income they received from cultivation is modest and so agricultural income formed only 18.86 per cent of total household incomes. Thus, it clears the fact that there are clear differences in incomes contribution to total household incomes across occupations.

Table 4.35: Occupation wise Distribution of Total Income and Total Expenditure of sample Tiwa Households

Occupation	Percentage to Total Sample	Total Income (In Rs.)	Percentage share to Total Sample income	Total Expenditure (In Rs.)	Percentage share to Total Sample Expenditure
Cultivation	35.52	998704	18.86	549975	19.68
Agricultural Labour	23.76	634754	11.99	399675	14.42
Non-agricultural Labour	13.80	364565	6.88	340096	8.34
Self employed	10.63	998995	18.86	630735	16.92
Service	16.28	2298586	43.41	1754955	40.64
Total	100	4146793	100	3175436	100

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

Table 4.35 also shows the level of consumption by occupation among Tiwa households of Morigaon and Nagaon districts of Assam. The results revealed the fact that households with formal occupation consume more compared to informal occupations. Households with service consume 40.64 per cent of total consumption, self-employed households consume 16.92 per cent, cultivator households consume 17.32 per cent, agricultural labour households consume 9.77 per cent and non agricultural labour households consume 10.71 per cent of total consumption.

Household level Consumption Expenditure on Different Items

In economically advanced country, however, income is used as a measure of standard of living. But, in developing countries, consumption is considered as better measure of a "standard of living." Deaton and Grosh (2000) argued that consumption expenditure is used to determine the standard of living of the people. 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 excludes the imputed rent of owner-occupied houses, and expenditure incurred in the productive enterprises.

Table 4. 36: 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	23.3	11.2
2	Other cereals and substitutes	0.6	1.3
3	Pulses and similar products	4.3	3.1
4	Milk and milk-made products	4.2	6.3
5	Salt, sugar and molasses	3.3	1.3
6	Edible oil	5.6	3.9
7	Egg, fish, and meat (pork, mutton)	4.3	4.7
8	Vegetables	7.9	5.1
9	Fruits	0.3	1.3
10	Spices	2.1	2.6
11	Misc (other food)	4.2	5.1
	Food Total (A)	60.1	45.9
12	Pan, tobacco and intoxicants	6.2	2.4
13	Fuel and electricity	4.5	5.9
14	Medical treatment (Institutional and non-institutional)	1.4	3.2
15	Conveyance/transportation	2.7	5.3
16	Rent (land and house)	0.5	0.7
17	Clothing and bedding	6.1	8.9
18	Footwear	0.9	1.6
19	Education	4.9	7.9
20	Durable goods	1.2	3.8
21	Mobile	2.5	2.9
22	Rituals	3.8	3.1
23	Repairing of premises	4.1	3.9
24	Misc. (other non-food)	1.1	4.5
	Non-food Total (B)	39.9	54.1
	Total (A+B)	100.00	100.00

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

Household consumer expenditure is sum total of monetary values of all the items (i.e. goods and services) consumed by the household on domestic account during a specified period or the reference period. The imputed rent of owner-occupied houses and expenditure incurred towards the productive enterprises of the households are excluded from the household consumer expenditure. Monthly per capita Consumption Expenditure (MPCE) is the household

consumer expenditure over a period of 30 days divided by household size (NSSO, 2014:9). Table 4.36 shows the share of different food and non-food items among BPL and APL Tiwa households (in percentage) as a whole in Morigaon and Nagaon districts. The BPL households spend more on food items (60.1 per cent) than on non-food items (39.9 per cent); while APL households spend more on non-food items (45.9 per cent) as compared to food items (54.1 per cent). The share of rice (for meals and preparing traditional drink) in total expenditure accounted for as high as 23.3 per cent and 11.2 in BPL and APL households respectively. The share of vegetables constituted 7.9 per cent of total expenditure whereas the expenditure on paan, tobacco and intoxicants are found as 6.2 per cent which is the third highest share to total expenditure among the BPL Tiwa households. The BPL households spend about 4.7 per cent of total expenditure on education which is unfortunately lower than the expenditure on intoxicants. This is doing the damages on the pattern of expenditure of such households. Among the major share expenditure, the share of clothing and bedding stood at 7.2 per cent, followed by repairing premises 6.3 per cent, fuel and electricity 5.5 per cent, equally 5.1 per cent in rituals and milk and milk-made products.

Among the APL households the share of cloth and bedding stood 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 per cent, rituals 5.0 per cent and so on. It was observed that highest per cent of total expenditure was incurred on rice among both BPL and APL families. It is because, though rice is basically used for meal, yet a large amount of rice is needed for preparing traditional drinks that are used in their daily life, rituals and reception of guests.

4.1.6   Descriptive Statistical Analysis

Table 4.37 shows summary statistics of monthly per capita income (MPCI) across Occupation. The average value of MPCI is the highest (Rs.6384.96) of households with service corresponding to the lowest average of MPCI (Rs. 991.11) of agricultural labour households. The maximum value of MPCI is found at Rs.8000 of households with service as against of minimum MPCI is of households with agricultural labour at Rs.750.

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Table 4.37: Summary Statistics of Monthly Per Capita Income (MPCI) across Occupations

Occupation	Max MPCI	Min MPCI	MEAN	SD
Cultivation	3875	800	1115.96	349.93
Agricultural Labour	1275	750	991.03	164.60
Non- agricultural Labour	1850	780	1012.96	304.56
Self-employed	7500	815	3936.35	2474.69
Service	8000	975	6384.96	2987.46
overall	8000	750	2131.85	1674.34

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

As per the recommendation of Expert Group (Rangarajan) 2014, households of rural Assam which per capita consumption expenditure are below Rs. 1009.66 are considered as living below poverty line. 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: (i) 365-days for clothing, footwear, education, institutional medical care, repairing of premises, ritual related expenses and durable goods, (ii) 7-days for edible oil, egg, fish and meat, vegetables, fruits, spices, beverages, refreshments, processed food, pan, tobacco and intoxicants, and (iii) 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).

In the present study, the recommendation of Expert Group (Rangarajan) is considered in order to estimate the poverty ratio among Tiwas of Morigaon and Nagaon districts of Assam. Table 4.38 shows that the average MPCE of agricultural labour households and non-agricultural labour households are Rs. 972.17 and Rs. 1000.55 respectively. It indicates that the incidence of poverty is more in agricultural and non-agricultural labour households among selected Tiwa households of Morigaon and Nagaon districts of Assam. The average value of MPCE of cultivator households is found at Rs.1019.80 which is marginally above the poverty line considered for rural Assam i.e. Rs.1009.66. Occupation wise the highest average of MPCE is found households with service (Rs.4874.88) which is followed by self-employed households in non-agriculture (Rs.2829.18). Thus, the economic condition of agricultural and labour households is living in a very poor condition.

Table 4.38: Summary Statistics of Monthly Per Capita Consumption Expenditure (MPCE) across Occupations

Occupation	Max MPCE	Min MPCE	MEAN	SD
Cultivation	2550	800	1019.80	349.93
Agricultural Labour	1200	750	972.17	164.60
Non- agricultural Labour	1750	780	1000.55	304.56
Self employed	4500	815	2829.18	2474.69
Service	6670	975	4874.88	2987.46
Overall	6670	750	1738.47	1262.28

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

Work helps to improve life condition and material wellbeing. Moreover, women engaged in different services and businesses are earning well and so they have a better economic condition compared to women worked in agriculture and allied activities. Thus average value of MPCI and MPCE appeared higher for women working households with formal occupations compared to working women households engaged with informal occupations.

Table 4.39: Frequency Distribution of Monthly Per Capita Income (MPCI) among Sample Tiwa Households (N=442)

MPCI (Rs.)	Frequency	Percentage Distribution
Below 1000	164	37.1
1000-2000	181	40.95
2000-3000	27	6.11
3000-4000	27	6.11
4000-5000	17	3.85
5000-6000	5	1.13
6000-7000	4	0.9
7000-8000	3	0.68
8000-9000	4	0.9
9000-10000	3	0.68
10000 and above	7	1.58
Total	442	100

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

Tiwa women engaged in cultivation and agricultural and non-agricultural labour, hardly able to pull their family out of the poverty. From this study, it is found that women engaged in cultivation and other labour works have marginally higher PCI as well as PCCE compared to the corresponding non-working women households. As a result, most of these families have limited financial resources available to cover children's education, child care, and health care costs. They have also very little access to good housing and housing amenities require to lead

a modern way of life. From table 4.39 it is evident that about 37.1 per cent Tiwa households monthly earning even less than Rs.1000. About 40.95 per cent households monthly earn between Rs.1000-Rs.2000, 6.11 per cent earn between Rs.2000-Rs.3000 and Rs.3000-Rs.4000, 3.85 per cent earn between Rs.4000-Rs.5000, 1.13 per cent earn between Rs.5000-Rs.6000.

Very few households are found earning more than Rs.5000 as monthly per capita income (MPCI). Only 0.9 per cent households are found in this present study earning between Rs. 6000-Rs.7000. The percentage of households earning monthly per capita income between Rs. 7000- Rs.8000, Rs.8000- Rs.9000 and Rs.9000 – Rs.10000 are only 0.68 per cent, 0.90 per cent and 0.68 per cent respectively. On the other hand, only 1.58 per cent households have earned Rs.10000 and above as monthly per capita income.

Table 4.40: Frequency Distribution of Monthly Per Capita Income (MPCI) among Sample Tiwa Households of Morigaon and Nagaon districts

MPCI (Rs.)	Morigaon (N=275)		Nagaon (N=167)	
	Frequency	Percentage Distribution	Frequency	Percentage Distribution
Below 1000	105	38.18	59	35.33
1000-2000	101	36.73	80	47.90
2000-3000	19	6.91	8	4.79
3000-4000	20	7.27	7	4.19
4000-5000	13	4.73	4	2.39
5000-6000	4	1.45	1	0.6
6000-7000	3	1.09	1	0.6
7000-8000	2	0.73	1	0.6
8000-9000	3	1.09	1	0.6
9000-10000	2	0.73	1	0.6
10000 and above	3	1.09	4	2.39
Total	275	100	167	100

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

When we compare district wise MPCI, it is evident from table 4.40 that 38.18 per cent in Morigaon and 35.33 per cent in Nagaon district earn MPCI less than Rs.1000.Thus, it can be said that the incidence of poverty is comparatively more in Morigaon compared to Nagaon.

The distribution of monthly per capita income (MPCI) by occupation is presented in table 4.41. It is evident that 40.13 per cent cultivator households, 55.14 per cent agricultural labour households, 39.34 per cent non-agricultural labour households, 12.77 per cent self-employed households earn MPCI less than Rs.1000. None of the households with service as prime occupation is found in this income class. The percentage of households with cultivation, earning

MPCI between Rs.1000-Rs.2000, is 43.31 per cent as against of 44.86 per cent of households with agricultural labour and 50.82 per cent of households with non-agricultural labour. About 14.89 per cent self-employed households and 9.72 per cent households with service are earning MPCI between Rs.1000-Rs.2000. The table 4.44 is self-explanatory that economic condition of the households belonging to informal occupation (cultivation and labour work) is in extremely worse situation. No agricultural labour household is found earning beyond Rs.2000 as per capita monthly income. There are only 9.84 per cent non-agricultural households is found earning between Rs.2000-Rs.3000.

Table 4.41: Occupation wise Households distribution on the basis of Monthly Per Capita Income (MPCI)

MPCI (Rs.)	Cultivator	Agricultural Labour	Non-agricultural Labour	Self-employed	Service
Below 1000	61(40.13)	59(55.14)	24(39.34)	06(12.77)	01(1.41)
1000-2000	67(43.31)	48(44.86)	31(50.82)	07(14.89)	07(9.69)
2000-3000	12(7.64)	-	06(9.84)	13(23.4)	10(13.90)
3000-4000	08(5.1)	-	-	08(17.02)	17(23.61)
4000-5000	06(3.82)	-	-	05(10.64)	16(22.22)
5000-6000	-	-	-	02(4.26)	03(4.17)
6000-7000	-	-	-	01(2.12)	04(5.55)
7000-8000	-	-	-	02(4.26)	04(5.55)
8000-9000	-	-	-	01(2.13)	02(2.78)
9000-10000	-	-	-	02(4.26)	04(5.55)
10000 and above	-	-	-	02(4.26)	03(4.17)
Total	154(100)	107(100)	61(100)	49(100)	71(100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during field survey.

Again no non-agricultural labour household is capable to earn MPCI beyond Rs.3000.This implies that households with labour work deprived from all basic necessary amenities require to lead a better quality of life. It is also found that nearly 5.1 per cent and 3.82 per cent cultivator households is earning between Rs.3000-Rs.4000 and between Rs.4000-Rs.5000 respectively. But no household of this occupation is earned MPCI beyond Rs.5000. Thus, it reveals the fact that cultivator household also facing similar types of deprivation in terms of access to basic health care for the members of the family, education for their children and better housing which are the most basic to lead a better living.

From the same table it is seen that about 13.90 per cent households with service and 23.4 per cent self-employed households are found earning between Rs.2000-Rs.3000, 23.61 per cent and 17.02 per cent between Rs.3000- Rs.4000, 22.22 per cent and 19.64 per cent between Rs.4000- Rs.5000, 4.17 per cent and 4.26 per cent between Rs.5000-Rs.6000, 5.55 per cent and 2.12 per cent between Rs. 6000-Rs. 7000, 5.55 per cent and 4.26 per cent between Rs. 7000-Rs. 8000, 2.78 per cent and 2.13 per cent between Rs.8000- Rs.9000, 5.55 per cent and 4.26 per cent between Rs.9000-Rs.10000 and 4.17 per cent and 4.26 per cent of households earning Rs.10000 and above respectively.

In order to find out the poverty rate, as mentioned above this study has followed the recommendation of Expert Group (Rangarajan) 2014 and take Rs.1009.66 per capita consumption expenditure as the state-specific poverty line for rural Assam to determine incidence of poverty among Tiwas. Therefore, the first class interval is taken as below Rs. 1010 in order to determine the poverty ratio among selected Tiwas of Morigaon and Nagaon districts of Assam. From table 4.42, it is evident that 36.72 per cent in Morigaon and 31.14 per cent in Nagaon household's per capita consumption expenditure are below Rs.1010.00. From this findings it is evident that poverty rate is comparatively higher in Morigaon (36.72 per cent) than that of Nagaon (31.14 per cent). Again, overall poverty rate is 34.63 among selected Tiwas in this present study. 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 as 25.7 per cent in rural areas, 13.7 per cent in urban areas and 21.9 per cent for the country as a whole. 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 among Tiwas in Morigaon is high as compared to average level of Assam while average level of poverty in Nagaon is low as compared to average level of Assam.

From table 4.42 it is evident that about 34.61 per cent Tiwa households spend less than Rs. 1010.00 as their per capita monthly consumption expenditure. About 37.10 per cent spend

between Rs.1000-Rs. 2000, 11.99 per cent spend between Rs.2000-Rs.3000, 8.60 per cent spend between Rs.3000-Rs.4000, 5.66 per cent households spend between Rs.4000-Rs.5000 as monthly per capita consumption expenditure. Very few households (2.49 per cent) are found spending Rs.5000 and above.

Table 4.42: Distribution of Sample Tiwa Households on the basis of Monthly Per Capita Consumption Expenditure (MPCE)

MPCE (In Rs.)	Morigaon		Nagaon		Overall	
	Frequency	per cent	Frequency	per cent	Frequency	per cent
Below 1010	101	36.72	52	31.14	153	34.61
1000-2000	96	34.91	68	40.72	164	37.1
2000-3000	34	12.36	19	11.38	53	11.99
3000-4000	23	8.36	15	8.98	38	8.6
4000-5000	14	5.09	11	6.58	25	5.66
5000 and above	7	2.55	2	1.2	9	2.04
Total	275	99.99	167	100	442	100

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

Occupation wise households distribution on the basis of monthly per capita consumption expenditure (MPCE) is presented in table 4.43. As per the recommendation of Expert Group (Rangarajan) 2014, table 4.43 also deliberately takes the first class interval as below Rs. 1010 to determine the poverty ratio across occupations among selected Tiwas of Morigaon and Nagaon districts of Assam. It is found that across occupations poverty ratio is 34.61 per cent. But an overwhelming majority of households whose principal earner engaged either in cultivation or in labour work are found as BPL households. In this present study, it is observed that about 44.16 per cent cultivator households, 48.60 per cent agricultural labour households and 49.18 per cent non-agricultural labour households are found living below poverty line. Thus, it reveals that households whose principal earners engaged either in cultivation or in any labour work has been found as the most economically deprived households among the selected Tiwas of Morigaon and Nagaon districts of Assam. Around 6.12 per cent self-employed households are living under BPL. Table 4.43 also indicates that 37.10 per cent households across occupations fall into the expenditure class of Rs.1010-Rs.2000. As observed it can be said that an overwhelming 71.71 per cent (34.61 per cent below Rs. 1010 and 37.10 per cent between Rs. 1010-Rs. 2000) sample households of the present study are living a very poor quality of life.

Even Less than 2 per cent households working as cultivator has been found spending Rs. 2000-Rs. 3000 on per member of the household. In contrast 19.67 per cent households depend on non-agricultural labour are spending between Rs. 2000-Rs. 3000, while no single households with agricultural labour found spending beyond Rs. 2000. It reveals the fact that non-agricultural labour work is comparatively more remunerative than that of agricultural labour work. Households whose principal earners are in service are found spending more on per member of the household followed by self-employed households.

Table **4**.43: Occupation wise Households distribution on the basis of Monthly Per Capita Consumption Expenditure (MPCE)

MPCE (Rs.)	Cultivation	Agricultural Labour	Non-agricultural Labour	Self-employed	Service	Across Occupations
Below 1010	68(44.16)	52(48.60)	30(49.18)	03(6.12)	0(0.00)	153(34.61)
1000-2000	80(51.95)	55(51.40)	19(31.15)	8(16.33)	02(2.82)	164(37.10)
2000-3000	3(1.95)	-	12(19.67)	16(32.65)	22(30.99)	53(11.99)
3000-4000	2(1.29)	-	-	8(16.33)	28(39.43)	38(8.60)
4000-5000	1(0.65)	-	-	11(22.45)	13(18.31)	25(5.66)
5000 and above	-	-	-	03(6.12)	6(8.45)	9(2.04)
Total	154(100)	107(100)	61(100)	49(100)	71(100)	442(100)

Figures in the brackets indicate the percentages of the total.
Source: Computed on the basis of primary data collected during the field survey.

Thus, composition of the poor by various occupational groups reveals that the share of agricultural and non-agricultural labour households in total poor is higher among selected Tiwas of Morigaon and Nagaon districts of Assam.

4.2 Analysis of Inequality (or Relative Poverty)

Inequality is a broader concept than poverty in that it is defined over the entire population, and does not only focus on the poor. Poverty data explains what is going on at the bottom of the income ladder. Income inequality data looks at the distribution of income. Inequality implies that there are disparities in the distribution. It is also termed as relative poverty. While no measure of economic well-being can be all encompassing, income is the measure most universally used because it affects both the quantity and quality of the goods and services a household can buy (Fisher and Johnson, 2005). While income is the standard metric used in

assessing income inequality and mobility, consumption expenditures have also widely been used to discuss these issues particularly in developing countries. In this study, measures of inequality are applied to both per capita household income as well as per capita household consumption expenditure among sample Tiwa households of the two districts of Nagaon and Morigaon.

4.2.1. Results of Inequality (or Relative Poverty) in Morigaon 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 4.44 shows the results of inequality measures among the Tiwa households within and across occupations in Morigaon district on the basis of per capita income. Among five categories of occupation in Morigaon district, the Range ratio (R) is as high as 2.76 among cultivator and as low as 0.53 among agricultural labour. The same is accounted for 3.40 for all occupations. The Standard Deviation (SD) and Coefficient of Variance (CV) are being higher 5808.102 and 1.137 respectively for service holder which is followed by self employed as SD and CV are 2590.385 and 1.072 respectively. The Relative Mean Deviations (RMD) came out at 0.191 for service, 0.197 for self employed and then 0.114 for cultivator, 0.116 for agricultural labour, 0.138 for daily wage earner and RMD for across occupation accounted as 0.122. Atkinson Index is high in service (0.379) as compared to other occupations (0.329 in self-employed, 0.1184 in agricultural labour, 0.156 in cultivation and 0.095 in non-agricultural labour). Atkinson Index across occupation 0.327 implies that 32.7 per cent of total income has to be sacrificed in order to have equal incomes. The Relative Theil Index i.e. RE (1) in service is 0.138 which means that inequality in the simulated income distribution is about 13.8 per cent of the maximum inequality as measured by Theil Index. Again, RE (1) in self-employment is 0.099 that means that inequality in the simulated income distribution is about 9.9 per cent of the maximum inequality as measured by Theil Index. The same is 3.87 per cent for agricultural labour, 3.44 per cent for non-agricultural labour and 4.17 per cent for cultivator households. The Theil RE (1) across occupation is 0.067 which means that inequality in the simulated in-

come distribution is about 6.7 per cent of the maximum inequality as measured by Theil Index.

4.2.2 Results of Inequality (or Relative Poverty) in Nagaon District

Table 4.45 shows the results of inequality measures among the Tiwa households within and across occupations in Nagaon District on the basis of per capita income. The Range (R) is as high as 3.10 among cultivators and as low as 0.615 among agricultural labour of five categories of occupation considered in this study. The same is accounted for 3.02for all occupations. When we consider overall inequality across occupation, it came out as Rs 49250.The Standard Deviation (SD) and Coefficient of Variance (CV) are higher 7309.974 and 1.504 respectively, for service holder which is followed by self employed as SD and CV are 5054.912 and 1.304 respectively. The Relative Mean Deviations (RMD) came out at 0.141 for service, 0.116 for self employed and then 0.083 for cultivator, 0.114 for agricultural labour, and 0.118 for non-agricultural labour. The Relative Mean Deviations (RMD) across occupation accounted as 0.131.

Atkinson Index is high in service (0.360) as compared to other occupations (0.259 in self employed, 0.097 in cultivation, 0.122 in agricultural labour and 0.075 in non-agricultural labour). Atkinson Index across occupation 0.433 implies that 43.3 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 agricultural labour is 0.142 which means that inequality in the simulated income distribution is about 14.2 per cent of the maximum inequality as measured by Theil Index. The same is 9.23 per cent for self employed, 4.23 per cent for cultivator, 3.52 per cent for agricultural labour and 4.03 per cent for non-agricultural labour. The Theil RE(1) across occupation is 0.172 which means that that inequality in the simulated income distribution is about 17.2 per cent of the maximum inequality as measured by Theil Index.

Table 4.46 and 4.47 reveal the results of inequality measures among the Tiwa households within and across occupations on the basis of per capita consumption expenditure in Morigaon and Nagaon district respectively. Results show that inequality on the basis of per capita consumption expenditure for all occupations is marginally lower than results of inequality

obtained from calculation on the basis of per capita income. The relative poverty is high in service and self employed in both the districts as compared to cultivation and any labour works. It is because occupations like cultivation and agricultural labour and non-agricultural labour have less difference in their earning patterns. So inequality based on their PCI is not as high as it is reasonably found in service and self employed group. The same inequality result has seen in both the study districts. The relative poverty is high in Nagaon district as compared to Morigaon district. It is because, Morigaon district, a highly flood affected district, is totally rural area where prime occupation of villagers is agriculture. Characteristics of villages, occupation pattern and quality of life are almost same in this district. On the other hand, Nagaon district is less flood affected and also some Tiwa households in the district are engaged in non-agricultural works. That is why, inequality of income and expenditure is high in Nagaon district.

Table 4.44: Inequality measures calculated on the basis of Monthly Per Capita Income (MPCI) among the Tiwa Tribe in Morigaon District (N=275)

Occupation	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)
Cultivation	2.76	0.114	279.42	0.270	0.191	0.157	0.161	0.195	0.041
Agricultural Labour	0.53	0.116	160.68	0.162	0.066	0.118	0.126	0.139	0.039
Non-agricultural Labour	1.05	0.138	159.78	0.157	0.068	0.095	0.114	0.113	0.034
Self-employed	1.19	0.195	2590.38	1.072	0.255	0.329	0.406	0.430	0.099
Service	1.07	0.198	5808.10	1.137	0.361	0.379	0.471	0.560	0.138
Over all	3.40	0.122	4225.71	1.610	0.340	0.327	0.379	0.366	0.067

Sources: Computed on the basis of primary data collected from the field survey.

Table 4. 45: Inequality measures calculated on the basis of Monthly Per Capita Income (MPCI) among Tiwas in Nagaon District (N=167)

Occupation	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)
Cultivation	3.10	0.112	477.40	0.288	0.147	0.097	0.158	0.161	0.042
Agricultural Labour	0.615	0.115	154.023	0.154	0.152	0.122	0.104	0.167	0.035
Non-agricultural Labour	1.10	0.140	118.21	0.125	0.053	0.075	0.104	0.110	0.040
Self-employed	1.04	0.191	5054.91	1.304	0.453	0.259	0.344	0.363	0.092
Service	1.29	0.199	7309.97	1.504	0.540	0.360	0.444	0.468	0.142
Over all	3.02	0.135	6024.10	1.866	0.474	0.433	0.515	0.501	0.172

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

Table 4.46: Inequality measures calculated on the basis of Monthly Per Capita Consumption Expenditure (MPCE) among the Tiwa Tribe in Morigaon District (N=275)

Occupation	Range	RMD	Variance (V)	Coefficient of variance (CV)	Standard deviation of log (SDL)	Atkinson In-dex	Theil E(0)	Theil E(1)	Theil RE(1)
Cultivation	2.41	0.104	250.64	0.241	0.172	0.14	0.144	0.175	0.037
Agricultural La-bour	0.46	0.105	145.13	0.146	0.059	0.106	0.113	0.125	0.035
Non-agricultural Labour	0.92	0.124	143.33	0.142	0.061	0.085	0.102	0.102	0.03
Self-employed	1.04	0.175	2313.57	0.962	0.229	0.299	0.364	0.386	0.089
Service	0.93	0.17	5208.87	1.02	0.324	0.339	0.422	0.502	0.124
Over all	2.96	0.11	3791.48	1.444	0.305	0.294	0.34	0.328	0.06

Sources: Computed on the basis of primary data collected from the field survey.

Table 4.47: Inequality measures calculated on the basis of Monthly Per Capita Consumption Expenditure (MPCE) among the Tiwa Tribe in Nagaon District (N=167)

Occupation	Range	RMD	Variance (V)	Coefficient of variance (CV)	Standard deviation of log (SDL)	Atkinson Index	Theil E(0)	Theil E(1)	Theil RE(1)
Cultivation	2.70	0.109	427.75	0.258	0.132	0.087	0.142	0.144	0.039
Agricultural Labour	0.54	0.104	138	0.140	0.136	0.109	0.093	0.15	0.031
Non-agricultural Labour	0.98	0.101	105.92	0.113	0.047	0.067	0.095	0.099	0.026
Self-employed	0.91	0.178	4529.2	1.168	0.406	0.232	0.308	0.325	0.082
Service	1.12	0.171	6549.73	1.348	0.484	0.323	0.398	0.419	0.127
Over all	2.63	0.117	5397.59	1.672	0.425	0.388	0.461	0.449	0.155

Sources: Computed on the basis of primary data collected from the field survey.

4.2.3 Gini coefficient across Occupations

Gini index also calculated within and across occupations on the basis of per capita income and per capita consumption expenditure. Table 4.48 contains the survey results of Gini Index among different occupations in Morigaon and Nagaon districts.

Table 4.48: Gini Coefficient across Occupations.

Occupation	GINI coefficient on the basis of PCI		GINI coefficient on the basis of MPCE	
	Morigaon	Nagaon	Morigaon	Nagaon
Cultivation	0.108	0.193	0.097	0.173
Agricultural Labour	0.085	0.083	0.077	0.076
Non-agricultural Labour	0.089	0.066	0.079	0.059
Self-employed	0.347	0.484	0.311	0.434
Service	0.444	0.503	0.398	0.451
Overall	0.527	0.586	0.473	0.526

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

In Nagaon district, Gini Coefficient is high among the service (0.503) followed by self-employed (0.484) and cultivation (.0.193). The lowest Gini is found in non-agricultural labour (0.066) which is followed by agricultural labour (0.085). In Morigaon district, Gini Coefficient is high among the service (0.444) followed by self-employed (0.347) and then cultivation (0.108). The lowest Gini is found in agricultural labour (0.085) which is followed by non-agricultural labour (0.089). Gini coefficient among the five occupations in Morigaon district is 0.527 whereas it is 0.586 in Nagaon district. The estimated Gini coefficient shows that 52.7 per cent income is distributed unequally among the occupation in Morigaon district while 58.6 per cent income is distributed unequally among the occupation in Nagaon district. It is found that Gini coefficient calculated on the basis of per capita consumption expenditure is slightly lower within and across occupations compared to Gini coefficient calculated on the basis of per capita income.

It was observed that inequality is high in service followed by self-employed and cultivation. It is due to the variability of earnings among the self-employed and regular salary earners under service, diversity in living conditions, location of housing (flood and erosion affected or not) and distance from the nearest town.

4.2.4 Inequality in Education and Health

Inequality in education within and across occupations among selected Tiwas in Morigaon and Nagaon districts based on monthly per capita expenditure on education (MPCEEDU) is presented in Table 4.49. Among five categories of occupation in Morigaon district, Standard Deviation (SD) is as high as 222.28 among service and as low as 57.34 among non-agricultural labour. The Coefficient of Variance (1.23) and Gini Coefficient (0.410) is highest in the same occupation (service). Gini Coefficient is the lowest among non-agricultural labour (0.129) followed by agricultural labour (0.218). The results presented in table 4.51 indicate that Gini Coefficient is found as 0.437 across occupation. In case of Nagaon district, Standard Deviation (SD) is as high as 829.11 among self-employed and as low as 35.14 among agricultural labour. The Coefficient of Variance is found as high as 1.98 among self–employed and as low as 0.87 among agricultural labour. Gini Coefficient is found the highest among service (0.447) and it is the lowest among non-agricultural labour (0.166). Gini Coefficient is found as 0.450 across occupation.

Table 4.49: Inequality in Education Within and across Occupations based on Monthly Per Capita Expenditure on Education (MPCEEDU)

Occupation	Morigaon			Nagaon		
	SD	CV	GI	SD	CV	GI
Cultivator	85.04	1.04	0.297	61.36	0.98	0.208
Agricultural Labour	88.37	1.11	0.218	35.14	0.87	0.225
Non-agricultural Labour	57.34	0.68	0.129	127.63	0.95	0.166
Self-employed	89.26	0.85	0327	829.11	1.98	0.332
Service	222.28	1.23	0.410	386.05	1.75	0.447
Across Occupations	141.20	1.25	0.437	415.50	2.22	0.450

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

Inequality in health within and across occupations among selected Tiwas in Morigaon and Nagaon districts based on monthly per capita expenditure on health (MPCEH) is shown in table 4.50. Among five categories of occupation in Morigaon district, Standard Deviation (SD) is as high as 151.97 among service and as low as 44.79 among non-agricultural labour. The Coefficient of Variance (1.52) and Gini Coefficient (0.468) is also highest in the same occupation (service). Gini Coefficient is low among agricultural labour (0.171) followed by non-agricultural labour (0.190). The results indicate that Gini Coefficient is found as 0.513 across occupation. In case of Nagaon district, Standard Deviation (SD) is as high as 274.63

among service and as low as 31.73 among cultivation. The Coefficient of Variance is found as high as 2.37 among service and as low as 0.86 among agricultural labour. On the other hand, Gini Coefficient is found the highest among service (0.422) and it is the lowest among non-agricultural labour (0.146). In Nagaon district, Gini coefficient is found as 0.519 across occupation.

Table 4.50: Inequality in Health Within and across Occupations based on Monthly Per Capita Expenditure on Health (MPCEH)

Occupation	Morigaon			Nagaon		
	SD	CV	GI	SD	CV	GI
Cultivation	50.91	1.06	0.262	31.73	0.92	0.230
Agricultural Labour	65.14	1.28	0.171	34.72	0.86	0.190
Non-agricultural Labour	44.79	0.85	0.190	96.74	1.42	0.146
Self-employed	70.48	1.17	0.337	188.28	1.42	0.366
Service	151.97	1.52	0.468	274.63	2.37	0.422
Across Occupations	95.87	1.45	0.513	145.89	2.81	0.519

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

4.2.5 Household Level Development Index (HLDI) and Inequality-adjusted Household Level Development Index (IHLDI)

The HDI represents an average of human development achievements in three dimensions: long and healthy life, knowledge and decent standard of living. Like all averages, it conceals all disparities in human development across the population within the same country. The IHDI takes into account not only the average achievements in these three dimensions but also how those achievements are distributed among its citizens. It does so by reducing or discounting each dimension's average value according to its level of inequality. The IHDI is built around Atkinson's (1970) well-known concept of "equally distributed equivalent" (EDE) achievements. The IHDI will be equal to the HDI when there is hardly any inequality between people and will fall further below the HDI the more inequality there is. In comparison with the IHDI, the HDI can be viewed as an index of potential human development (the average HDI people could enjoy given today's overall achievements if there were low inequality). In contrast, the IHDI reflects the actual level of human development (accounting for inequality) that the average person experiences at present. The difference between the HDI and the IHDI measures is the "loss" in potential human development due to current levels of inequality. The IHDI directly links inequalities in each dimension of the HDI to the resulting

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loss in human development, thus it can help inform policies towards inequality reduction and assist in evaluating their impact. Results of both HLDI and IHLDI for Morigaon and Nagaon districts are shown in table 4.51 and table 4.52.

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 4.51 presents the dimension indices and household-level development index value of Nagaon and Morigaon Districts. HLDI value in Nagaon district came out marginally higher at 0.523 as compared to Morigaon district which stood at 0.511. Tiwa villages in Nagaon district are less-flood affected with lower distance to urban centres and higher avenues of other than agriculture occupations.

Table 4.52 shows the detail results of the value of IHLDI indicators and Atkinson's inequality measure. The Inequality-adjusted HLDI 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 HLDI (education, health and per capita income) are adjusted for inequalities in attainments across people of the Tiwa community. The result shows that Atkinson's inequality measure for distribution of health score, education score and household per capita income in Nagaon district constituted 28.35 per cent, 16.24 per cent and 22.92 per cent respectively; whereas these values in Morigaon district are 07.85 per cent, 13.39 per cent and 41.34 per cent respectively. Inequality-adjusted Household-level Development Index (IHLDI) values of Nagaon and Morigaon districts accounted for 0.398 and 0.414 respectively. Household-Level Development Index (HLDI) values using unlogged PCI are estimated at 0.524 and 0.514 in Nagaon and Morigaon district respectively. Loss due to inequality in Nagaon and Morigaon districts were being 24.0 per cent and 19.40 per cent.

Table 4.51: Dimension Indices and Household-level Development Index Value

Nagaon (N=167)		Morigaon (N=275)	
Health Index	0.574	Health Index	0.540
Education index	0.570	Education index	0.517
Income index	0.438	Income index	0.449
HLDI (taking log)	0.523	HLDI(taking log)	0.511

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

Table 4.52: Indicators of IHLDI and Atkinson's Inequality Measure

District	Atkinson's inequality measure for distribution of			Inequality-adjusted dimensional indices			Inequality-adjusted Household-level Development Index (IALDI)	Loss due to inequality	Coefficient of human inequality
	Health Score	Education Score	Household Per Capita Income	Health Index	Education Index	PCI Index	Development Index (IALDI)		
	percent	per cent	per cent	value	value	value	value	per cent	per cent
Nagaon	28.35	16.24	22.92	0.59	0.46	0.35	0.398	24.0	22.50
Morigaon	07.85	13.39	41.34	0.53	0.49	0.27	0.414	19.4	20.86

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

4.3 Analysis of Quality of Life

Quality of life is a relative term. There is no universally accepted definition for the term quality of life and neither there are any generally accepted indicators of quality of life. With this background, it was decided to study quality of life mainly to identify a set of indicators which best explain the physical quality of life of the people. In order to assess the physical quality of life, the analysis was carried out at village level, household level and individual level. In this study, quality of life is considered four important dimensions such as economic, education, health and housing type of the people.

Indicators describing economic condition of people are considered to be important determinants to explain well-being. In this study, household level economic condition which is to be known from economic index (EI) is constructed from per capita consumption expenditure index and asset index. It is evident from table 4.53 that economic index among Tiwa at a low level for both the districts. Economic index (EI) is 0.419 in Morigaon district and 0.426 in Nagaon district.

Table 4.53: Dimension Indices and Household Level Quality of Life index among Sample Tiwa Households

Dimension Indices	Morigaon (N=275)				Nagaon (167)			
	Max.	Min.	Mean	SD	Max.	Min.	Mean	SD
EI	0.989	0.065	0.419	0.287	0.909	0.090	0.426	0.275
EDUI	0.960	0.113	0.550	0.174	0.897	0.069	0.571	0.267
HI	0.933	0.071	0.540	0.228	0.92	0.104	0.574	0.247
HQI	0.967	0.044	0.440	0.330	0.993	0.038	0.475	0.348
HQLI	0.891	0.096	0.487	0.255	0.877	0.107	0.512	0.284

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

The educational status is an important social indicator that has direct as well as mediating effect on their quality of life through factors like living conditions and economic status. Low levels of education increase economic hardship. Individuals with low levels of education have lower incomes than those with high levels of education, mostly because they are less likely to be employed, and if employed, more likely to hold low-level jobs. Low levels of education further deprive people of the problem-solving resources needed to cope with the stresses of economic hardship. Education is an important individual investment with far-reaching effects on the sense of personal control and, to a lesser extent, on social support,

resulting in improved emotional and physical well-being. The well educated have higher personal control than the poorly educated, even adjusting for employment, job autonomy, earnings, minority status, age, marital status, sex, and household work. It is also apparent that as the educational level of an individual improves their awareness about health care and health promotion also improves. This has a direct and positive effect on quality of life. In our study, the mean household education index (EDUI) is found as 0.550 in Morigaon district and 0.571 in Nagaon district. Our results indicate an average level of education attainment among Tiwas. It leads to lower level of their physical quality of life. Physical health is generally accepted as the most important dimension of QOL. Health index (HI) is shown at an average level at 0.540 in Morigaon and at 0.574 in Nagaon district.

The fourth and final dimension of HQLI is housing type and availability of household amenities. Housing as a basic need is as important as food and clothing. Adequate housing is a major indicator of the standard of life of any society. It is argued that the, types of houses, their quality and availability of basic household amenities such as drinking water, toilet, electricity, number of living rooms, availability of kitchen, bathroom etc., can be used as non economic indicators to measure quality of life of the people. Better housing is essential for a better economic and social future. Better housing not only increases the standards of living and health of individuals, but also reduces the rate of mortality and morbidity. Keeping this in mind, the present study considers housing and household amenities as one of dimensions to assess the quality of life the Tiwa people. The index of housing quality status highlights that both the districts have not been able to enjoy a better housing and household amenities require to maintain a decent standard of life. The results show that Nagaon district is in a better housing condition as HQI is 0.475 compared to 0.440 of Morigaon district. The overall household level quality of life index (HQLI) is 0.487 in Morigaon district and 0.512 in Nagaon district. It is noticed that, values of all dimension indices of quality of life are very low in both the districts and so overall household level quality of life index turned out at a very poor level.

Block wise Households Level QLI

Having constructed indices measuring the four facets of quality of life in the study area, the present study measures block wise households level QLI. It is evident from table 4.54 that Lahorighat and Bhurbondha blocks of Morigaon district have shown lower economic index, health index and housing quality index compared to other selected blocks in this study of the two districts. In Lahorighat block the average value of economic index, health index and housing quality index is 0.399, 0.502 and 0.372 and the corresponding figure is 0.384, 0.511 and 0.389 in Bhurbondha block. These two blocks are comparatively more flood affected and away from district head quarter.

Table 4.54: Block wise Dimension Indices of Household Level Quality of Life index

Block	Dimension Indices	Max.	Min.	Mean	SD
Lahorighat (Morigaon)	EI	0.892	0.092	0.399	0.283
	EDUI	0.913	0.096	0.516	0.217
	HI	0. 776	0.035	0.501	0.260
	HQI	0.816	0.089	0.372	0.321
Bhurbondha (Morigaon)	EI	0.909	0.090	0.384	0.286
	EDUI	0.803	0.142	0.529	0.168
	HI	0.830	0.047	0.511	0.278
	HQI	0.867	0.103	0.389	0.325
Mayong (Morigaon)	EI	0.911	0.122	0.406	0.305
	EDUI	0.920	0.154	0.565	0.189
	HI	0.850	0.069	0.571	0.247
	HQI	0.903	0.119	0.478	0.307
Kapili (Morigaon)	EI	0.901	0.024	0.401	0.230
	EDUI	0.980	0.204	0.587	0.211
	HI	0.9	0.138	0.54	0.208
	HQI	0.903	0.019	0.481	0.247
Udali (Nagaon)	EI	0.829	0.017	0.403	0.217
	EDUI	0.968	0.294	0.569	0.136
	HI	0.928	0.069	0.558	0.234
	HQI	0.968	0.019	0.467	0.269
Raha (Nagaon)	EI	0.886	0.068	0.467	0.203
	EDUI	0.894	0.034	0.515	0.265
	HI	0.867	0.140	0.539	0.191
	HQI	0.993	0.108	0.505	0.225
Kathiatoli (Nagaon)	EI	0.909	0.073	0.490	0.198
	EDUI	0.925	0.003	0.522	0.233
	HI	0.92	0.114	0.548	0.205
	HQI	0.883	0.132	0.502	0.238

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

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Kathiatoli block of Nagaon district has shown the highest average value of economic index (0.490) which is followed by Raha (0.467), Mayong (0.406), Udali (0.403) and then Kapili (0.401). The highest value of education index is found in Kapili (0.587) which is followed by Udali (0.569), Mayong (0.565), Bhurbondha (0.529), Kathiatoli (0.522) and then Lahorighat (0.516). In education index, the lowest value of education index is found in Raha (0.515) block of Nagaon district. Though almost all sampled blocks of Morigaon district affected from flood but the education index is found better compared to selected blocks of Nagaon district. Regarding health index, Mayong has the highest average value (0.571) compared to all selected blocks of the two districts. In case of housing quality index (HQI), Raha block of Nagaon district has come out with the highest average value (0.502) as against of the lowest average value (0.372) of Lahorighat block of Morigaon district.In housing quality index Raha block is followed by Kathiatoli (0.502), Kapili (0.481), Mayong (0.478), Udali (0.467) and then Lahorighat (0.38).

Table 4.55: Block Wise Overall Household Level Quality of Life Index (HQLI)

District	Block	Max.	Min.	Mean	SD
Morigaon	Lahorighat	0.836	0.096	0.447	0.270
	Bhurbondha	0.822	0.099	0.453	0.264
	Mayong	0.891	0.101	0.505	0.262
	Kapili	0.803	0.112	0.502	0.224
Nagaon	Udali	0.811	0.103	0.499	0.214
	Raha	0.877	0.107	0.507	0.221
	Kathiatoli	0.856	0.117	0.516	0.219

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

Table 4.55 depicts block wise overall HQLI among Tiwa People in Morigaon and Nagaon Districts of Assam. The mean value of HQLI is the highest in Kathiatoli block (0.516) which is followed by Raha block (0.507) of Nagaon district, Mayong block (0.505) and then of Kapili block (0.502) of Morigaon district. The least mean value of HQLI is obtained for Lahorighat block (0.447) which is followed by Bhurbondha block (0.453) of Morigaon district and then Udali block (0.499) of Nagaon district. Compared to other selected blocks of the two districts, Kathiatoli and Raha are comparatively nearer to the district head quarter and also less affected by flood. The HQLI in the selected blocks are ranging from 0.447 to 0.516

which indicates a similar kind of moderate quality of life living by Tiwa people in all blocks of the selected two districts of Assam.

Households Level QLI by Occupation

Work is one of the primary factors to improve the physical quality of life. People work primarily to achieve a decent standard of living. The income earned through work is usually used on food and nutrition for the members of the family, on children education and health of the family, enjoying better housing and household's amenities. Thus there is a close link between work and physical quality of life of the people. But the link between work and quality of life is not always positive. All works are not able to enhance the quality of life of the people. As per the findings of the current study, it is evident that households engaged in cultivation and agricultural and non- agricultural households are not able to have a decent standard of life. The average value of dimensional indexes presented in table 4.56 speaks the fact of poor quality of life of households with informal occupations.

Table 4.56: Occupation wise Dimension Indices of Household Level Quality of Life Index

Occupation	Dimension Indices	Max.	Min.	Mean	SD
Cultivation	EI	0.395	0.023	0.298	0.177
	EDUI	0.822	0. 044	0.431	0.160
	HI	0.679	0.071	0.383	0.200
	HQI	0.579	0.006	0.245	0.237
Agricultural Labour	EI	0.224	0.023	0.168	0.141
	EDUI	0.568	0.002	0.358	0.143
	HI	0.579	0.006	0.373	0.195
	HQI	0.357	0.071	0.234	0.232
Non-agricultural Labour	EI	0.314	0.017	0.217	0.168
	EDUI	0.737	0.054	0.372	0.098
	HI	0.710	0.035	0.389	0.244
	HQI	0.483	0.013	0.252	0.203
Self-employed	EI	0.886	0.204	0.464	0.256
	EDUI	0.803	0.142	0.564	0.179
	HI	0.884	0.238	0.560	0.231
	HQI	0.903	0.379	0.555	0.290
Service	EI	0.955	0.235	0.512	0.298
	EDUI	0.960	0.294	0.694	0.180
	HI	0.950	0.203	0.673	0.233
	HQI	0.993	0.383	0.698	0.262

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

It is evident from the results that the values of different sub-indices of HQLI vary over the occupations. While the service and self-employed households (their mean value of dimensional indexes of HQLI being high) have appreciably high quality of life, but the households whose main source of earnings are cultivation and any labour works (whose mean value of dimensional indexes of HQLI are not at all satisfactory) are in a poor living condition. In all dimensional indexes of HQLI, households with service have the highest mean value which is followed by self-employed households. The average value of economic index (EI), education index (EDUI), health index (HI) and housing quality index (HQI) for households with service is found as 0.512, 0.694, 0.673 and 0.698 respectively. The mean value of dimensional indexes is found as the lowest for those households whose principal earners working as agricultural labour which is followed by non-agricultural labour and then cultivator. The mean value of economic index is found as 0.168 for households with agricultural labour and 0.217 for households with non-agricultural labour. The poor earnings of these two occupations have adversely affected their overall quality of life. The results presented in table 4.56 reflect that education index (EDUI) at 0.358 and 0.358, health index (HI) at 0.373 and 0.372 and housing quality index (HQI) at 0.234 and 0.252 respectively for agricultural labour and non-agricultural labour households. Households whose principal earners engaged in cultivation their mean value of economic index, education index, health index and housing quality index are found as 0.298, 0.431, 0.383 and 0.245 respectively. These numbers itself indicate that households depend on cultivation are also not having the sufficient earnings and so also they spend their life in a poor living condition. The only encouraging thing emerging from this study is that households with cultivation and labour works have shown a good maximum value of education index. It is found that the maximum value of education index in cultivation is 0.822 which is followed by non-agricultural labour at 0.737 and then agricultural labour at 0.568. These maximum values are due to the interest of young generation in education, their good performances and also some kind of awareness coming from older generations belonging to these informal occupations (i.e. cultivation and agricultural and non-agricultural labour in this study).

		Table 4.57: Households' Level Quality of Life Index (HQLI) by Occupation		
Occupation	Max.	Min.	Mean	SD
Cultivation	0.638	0.107	0.339	0.184
Agricultural Labour	0.482	0.099	0.283	0.113
Non-agricultural Labour	0.502	0.096	0.308	0.146
Self-employed	0.819	0.325	0.536	0.226
Service	0.891	0.322	0.644	0.218

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

Table 4.57 reveals the value of HQLI across occupations. HQLI is the highest for households with service (0.644) as against the lowest HQLI for households with agricultural labour (0.283). Self-employed households have HQLI value (0.536) which is much higher compared to households with cultivation (0.339). Households with non-agricultural labour have also shown very poor HQLI value (0.308). It is evident that organised occupations such as salaried households and households with self-employed have able to invest sufficiently in educational attainment and health improvement on the members of the households. They have also had better housing and household amenities. As a result, these two occupations have shown better index value of all dimensions of HQLI compared to unorganised occupations such as cultivation and agricultural and non-agricultural labour. From the results of the present study, it is fact that HQLI varies across occupations. Thus, the present study accepts the third and final alternative hypothesis i.e. HQLI varies across occupations.

Households Level Quality of Life Index by Women's Working Status

For working and non-working women households HQLI by occupation are presented in Table 4.58.

	Table 4.58: Occupation wise Households Level Quality of Life Index (HQLI) on the basis of Working Status of Women							
	Working women households (N=192)				Non-working women households (N=250)			
Occupation	Max.	Min.	Mean	SD	Max.	Min.	Mean	SD
Cultivation	0.638	0.117	0.358	0.194	0.612	0.107	0.319	0.172
Agricultural Labour	0.482	0.103	0.303	0.191	0.453	0.099	0.263	0.199
Non-agricultural Labour	0.509	0.101	0.356	0.176	0.356	0.096	0.259	0.148
Self-employed	0.819	0.325	0.661	0.158	0.711	0.329	0.411	0.196
Service	0.891	0.343	0.717	0.134	0.807	0.322	0.571	0.247

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

It is seen that HQLI of working women households with salaried income is 0.717 as against 0.571 of non-working women households with salaried income. Again, HQLI of self-

employed households in non-agriculture is 0.661 as against 0.441 of non-working women self-employed households in non-agriculture. The HQLI of working women self-employed households in agriculture, households with casual work in non-agriculture and households with casual work in agriculture are found as 0.358, 0.356 and 0.303 respectively. On the other hand, HQLI of non-working women self-employed households in agriculture, households with casual work in non-agriculture and households with casual work in agriculture are found as 0.319, 0.259 and 0.263 respectively.

It is evident from table 4.58 that the better HQLI is found for those households whose women are working compared to HQLI of corresponding occupations whose women are not in any kind of earning activities. From the results, the study accepts the second hypothesis that women economic participation raises HQLI at the households' level. Thus, it is incredibly vital for people to value that women's wages are key definers of a family's economic health and so also to have a better quality of life. For the health of families, communities, and the state, it is imperative that women should have get equal opportunity with men to get employment by their choice and efficiency. They should also pay fairly for their work.

4.4. Econometric Analysis

4.4.1 Correlation Coefficients between HQLI and related Continuous Variables:

It is important to check the bi-variate simple correlation values before running any multiple regression model. The correlation matrix serves two important purposes. One, to check the strength and direction of association among different variables. Two, to check whether there is near perfect (+1 or -1) among any pair of variables. Table 4.59, 4.60 and 4.61 indicate correlation coefficients of HQLI and related continuous variables of Nagaon, Morigaon and overall sampled households of the present study. As table 4.59 shows most variables are strongly associated with each other and none of the association are inverse. In other words, all variables are positively associated with each other. Moreover, none of the correlation values are more than 0.80. Since, each of these variables represents some quality of life indicator, positive association is quite expected. For instance, health, education, income, consumption, asset and housing quality are all expected to be positively associated with each

other. Similar observation is noted in table 4.60 where none of the correlation values have crossed 0.80. Very similar conclusion can be drawn from table 4.61.

Table 4.59: Correlation matrix between scores of HQLI and related Continuous Variables of Sample Tiwa Households of Nagaon district (N=167)

	AS	ADES	CES	HQS	HS	MPCI	MPCM	PCPA
AS	1							
ADES	0.717**	1						
CES	0.766**	0.662**	1					
HQS	0.785**	0.713**	0.724**	1				
HS	0.619**	0.730**	0.702**	0.676**	1			
MPCI	0.736**	0.616**	0.511**	0.723**	0.671**	1		
MPCM	0.756**	0.685**	0.667**	0.742**	0.772**	0.658**	1	
PCPA	0.788**	0.716**	0.574**	0.762**	0.716**	0.778**	0.686**	1

Notes: AS= Asset score; ADES= Adult education score; CES= Children education score; HQS= Housing quality score; HS= Health score; MPCI= Monthly per capita income; MPCE= Monthly per capita consumption expenditure; PCPA= Per capita plinth area of the house.
**. Correlation is significant at the 0.01 level (2-tailed).
Source: Computed on the basis of primary data collected during field survey.

Table 4.60: Correlation matrix between scores of HQLI and related Continuous Variables of Sample Tiwa Households of Morigaon district (N=275)**.**

	AS	ADES	CES	HQS	HS	MPCI	MPCE	PCPA
AS	1							
ADES	0.755**	1						
CES	0.672**	0.566**	1					
HQS	0.788**	0.757**	0.574**	1				
HS	0.719**	0.699**	0.617**	0.690**	1			
MPCI	0.715**	0.625**	0.561**	0.738**	0.678**	1		
MPCM	0.730**	0.764**	0.544**	0.768**	0.690**	0.693**	1	
PCPA	0.754**	0.649**	0.554**	0.768**	0.718**	0.780**	0.799**	1

Notes: AS= Asset score; ADES= Adult education score; CES= Children education score; HQS= Housing quality score; HS= Health score; MPCI= Monthly per capita income; MPCE= Monthly per capita consumption expenditure; PCPA= Per capita plinth area of the house.
**. Correlation is significant at the 0.01 level (2-tailed).
Source: Computed on the basis of primary data collected during field survey.

Table 4.61: Correlation matrix between scores of HQLI and related Continuous Variables of Sample Tiwa households (N=442).

	AS	ADES	CES	HQS	HS	MPCI	MPCE	PCPA
AS	1							
ADES	0.771**	1						
CES	0.696**	0.584**	1					
HQS	0.689**	0.769**	0.623**	1				
HS	0.618**	0.705**	0.646**	0.786**	1			
MPCI	0.709**	0.611**	0.519**	0.721**	0.665**	1		
MPCE	0.756**	0.768**	0.504**	0.779**	0.703**	0.785**	1	
PCPA	0.756**	0.636**	0.542**	0.757**	0.709**	0.779**	0.786**	1

Notes: AS= Asset score; ADES= Adult education score; CES= Children education score; HQS= Housing quality score; HS= Health score; MPCI= Monthly per capita income; MPCE= Monthly per capita consumption expenditure; PCPA= Per capita plinth area of the house.
**. Correlation is significant at the 0.01 level (2-tailed).
Source: Computed on the basis of primary data collected during field survey.

From table 4.59, 4.60 and 4.61 it is found that there is strong and significant correlation between HQLI and education score, health score, housing quality score, per capita plinth area, monthly per capita income and monthly per capita consumption expenditure. So, we can accept our alternative hypothesis that there is positive association between education, health and economic well being at the household level.

4.4. Econometric Analysis

4.4.1. Ordinary Least Squares Regression Analysis: In order to identify important demographic, economic and social variables that determine the different dimensions of quality of life, this study has applied OLS regression method.

Model-I: Determinants of Monthly Per Capita Household Expenditure (MPCE) of Tiwa Households

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. The empirical results presented in table 4.62 indicate that the explanatory power of the regression equation as measured by R^2 is significantly high ($R^2 = 0.86$). It implies that about 86 per cent of the variation in the dependable variable (monthly per capita consumption expenditure) is due to the explanatory variables taken in our

model and the remaining 14 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 Monthly Per Capita Household Expenditure (MPCE). The adjusted R squared value was 0.85. This indicates that 85 per cent of the variance in the dependent variable is explained by the variations in the independent variables. The test of significance (F-test) is accepted at the 1 per cent and 5 per cent level of significance.

In this model, health score of the household is found to be insignificant. Since insignificant variables are dropped in Model-IB, hence health score is also dropped. In model-I the other insignificant variables are sex ratio, indebtedness, income earned under MNREGS and electricity connection dummy. Since MPCE measures the purchasing power of the household and physical standard of living it may be argued that components of health, education and energy are determined by MPCE rather than these variables determining MPCE. In other words there could be bi-directional causality between health and consumption, education and consumption and also energy demand and consumption. Arguably purchasing power of the households determines whether they could be able to afford modern and safe energy sources like electricity and LPG. However in Model-I, MPCE is a proxy for physical standards of living, the explanatory variables or regressors are the most vital determinants of standard of living (SOL). Hence, the hypothesised regression specifications of Model-I is economically justified.

Although coefficients indebtedness, electricity connection dummy and sex ratio are positive, they are insignificant and thus may be dropped from Model-I A and Model-I is re-estimated and estimated results are presented under Model-I B. Finally significant variables are included in Model-I B. Both children and adult education score are significant and positive although it may not wise to infer that the educational attainments influences physical SOL, rather the opposite is most likely to be true. Although adult education attainment can determine household's standard of living, children education attainments are determined by the household's purchasing power.

The flood dummy is negative and significant implying that households suffering from frequent water logging due to floods are economically more vulnerable as household members

have to relocate during floods, sacrificing their traditional occupation or ever seasonal occupation. Recurrent floods result in job loss, crop loss (in case of cultivator households) and economic cost of relocation. More over floods can result in severe deterioration in health quality, living standards, children education and finally higher indebtedness. In the present study, remoteness is taken as proxy by the distance of the households from the nearest urban centre. That is higher remoteness implies greater distance from the nearest urban centre. This coefficient has turned out to be negative, it implies greater is the remoteness lower is the purchasing power or physical standard of living as captured by MPCE. Thus remoteness is synonymous to economic backwardness according to result of Model-I.

WWP is positive and significant in determining MPCE. This is expected as presence of working women raises household's per capita income and thus MPCE. In other words, households with working women would have higher consumption standards and this is reflected in the results of table 4.62. In the present study, joint family set up is assigned score '1' and while nuclear family is given '0'. Since the coefficient is negative and significant we may infer that staying as joint family has a negative influence on MPCE. Or in other words, joint family set up is detrimental to SOL as captured by MPCE. This is expected in a rural set up where joint family set up would raise dependency ratio and would imply responsibility sharing, asset sharing and income and consumption sharing within members of the joint family. Since joint family set up among agricultural households (including landless labourers) may raise distress levels on account of lower per capita resources enjoyed. It may influence SOL negatively. On the hand, in nuclear families working age group women may have greater freedom and can contribute positively to households aggregate income either directly or through imputed values of wages (in case of women agricultural workers on family own farm). Thus, the present findings imply that breakup of the traditional family set up is economically beneficial.

Main road connectivity is found to have a positive influence on MPCE. In other words, the closer the sample household is located to some motor able road connecting the village with the district head quarter, the higher is the mobility of the household members and higher is the possibility of participation in non-agricultural jobs. Moreover, households in the proximi-

ty of main road are expected to have greater urban exposure, educational attainments and hence higher chances of employment diversifications. Moreover, since the main road connectivity is another proxy measure of remoteness the results imply that less remote households are economically more empowered as government plans, programmes and economic packages are expected to reach the less remote regions faster as the government delivery system is expected to be weak in remote corners of the selected districts. Better SOL is expected to determine sex ratio rather than the converse. But Model I hypothesise sex ratio as a determinant of SOL. Since it is insignificant it is dropped in Model I B.

Dependency ratio influences MPCE negatively which is expected. Agricultural dummy is negative and significant implying that being an agricultural household influences MPCE negatively. In other words, households with non-agricultural sources of income have higher MPCE. This indicates that agriculture in the region is backward and hence cannot be taken up household as the sole source of earning as it leads to lower SOL. Thus for the present study any agricultural occupation is synonymous with economic backwardness. Income earned under MNREGS is negative but insignificant and hence is dropped in Model-I B. Similarly electricity as an energy has a positive but insignificant coefficient. It is also dropped in Model- IB. The coefficient of LPG dummy is both positive and significant implying that LPG consumer households have higher SOL. However, it is to be kept in mind that LPG consumption is determined by household's economic states or the purchasing power and not the converse. However Model I keeps LPG as a regressor, as MPCE is used here as a proxy for physical SOL

Heteroskedasticity Test: White

F-statistic	1.228818	Prob. F(11,442)	0.3936
Obs*R-squared	2.460642	Prob. Chi-Square(11)	0.3922
Scaled explained SS	6.754508	Prob. Chi-Square(11)	0.1341

White heteroskedasticity test conducted in Eviews verifies that the residuals are homoscedastic and heteroskedasticity is absent in the data.

Table 4.62: Regression Results – Determinants of Monthly Per Capita Consumption Expenditure (MPCE) of Tiwa Households (N=442)

Explanatory Variables	Model-I A				Model-I B			
	B	SEB	t-ratio	p-value	B	SEB	t-ratio	p-value
Adult Education Score	21.45	3.58	5.99	0.00	21.76	3.35	6.48	0.00*
Children Education Score	10.37	5.57	1.86	0.06	11.90	5.33	2.23	0.02**
Health Score	8.49	8.82	0.96	0.33	-			
Flood Dummy	-245.10	62.95	-3.89	0.00	-250.48	61.26	-4.08	0.00*
Distance from Nearest Urban Centre	-4.08	0.95	-4.26	0.00	-3.99	0.90	-4.41	0.00*
Women Workforce Participation	202.25	31.17	6.49	0.00	199.71	30.57	6.53	0.00*
Family Type	-139.04	44.69	-3.11	0.02	-129.57	40.49	-3.19	0.00*
Main road Connectivity with Village	130.54	36.80	3.55	0.00	134.93	36.08	3.74	0.00*
Sex Ratio (members)	0.38	0.99	0.38	0.69	-			
Dependency Ratio	-3.08	1.13	-2.74	0.01	-2.96	1.06	-2.79	0.01*
Indebtedness	23.44	30.18	0.77	0.43	-			
Occupation in Agriculture Dummy	-46.16	7.19	-6.42	0.00	-66.72	9.28	-7.19	0.00*
Income earned Under MNREGS	-1.16	1.076	-1.07	0.28	-			
Electricity Connection Dummy	21.49	57.11	0.37	0.70	-			
LPG Dummy	20.06	5.45	3.68	0.02	24.80	6.17	4.02	0.01*
Constant	1131.16	217.39	5.20	0.00	1112.89	173.81	6.40	0.00
R-square	0.86	Akaike criterion	14.32		0.86	Akaike criterion	14.30	
Adjusted R^2	0.85	Hannan-Quinn	14.39		0.85	Hannan-Quinn	14.34	
Log-likelihood	-3147.81	Schwarz criterion	14.49		-3149.93	Schwarz criterion	14.41	
F-statistic	152.31	Durbin-Watson statistic	1.34		236.5648	Durbin-Watson statistic	1.35	
P-value (F)	0.00				0.00			

Notes: Dependable variables: Monthly Per Capita Consumption Expenditure.
A dash (-) refers to the situation where corresponding insignificant variables are dropped.
*, ** Significant at 1 and 5 per cent level respectively.

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

Model-II: Determinants of Households Education Score (EDUS) of Tiwa Households

In this regression model, households education score (EDUS**)** is used as dependant variable. The empirical result shows that the explanatory power of the regression equation as measured by R^2 is significantly high (R^2 =0.80). It implies that about 80 per cent of the variation in the dependable variable (education score) is due to the explanatory variables taken in our model and the remaining 20 per cent is due to other unmentioned variables. The adjusted R squared value was 0.79. This indicates that 79 per cent of the variance in the dependent variable is explained by the variations in the independent variables.

In model-II, insignificant variables are sex ratio, indebtedness, flood dummy, distance from the nearest urban centre, family type, LPG dummy and electricity connection dummy. All these variables are dropped from Model-II A and Model-II is re-estimated and estimated results are presented under Model-II B. Finally significant variables are included in Model-II B. The regression result in table 4.63 shows variables monthly per capita consumption expenditure, health score, housing quality score, informal sector occupation dummy and women workforce participation have positive and statistically significant determinants of households education score (EDUS**)**. An additional increase of these variables improves the household's education score.

The socio-economic determinants of EDUS are kept as regressors in Model-II where the dependent variable is EDUS. MPCE captures the purchasing power of the households and hence is expected to reflect the demand for education by the household. Although the overall health status of a household does not directly influence EDUS, it is kept as a regressor in Model-II as it acts as a proxy for living condition, awareness and life styles all of which are expected to influence EDUS positively. Housing score also captures the quality of living and physical freedom of member inside the house. Thus housing score which is also an indicator of socio-economic status and physical SOL is expected to influence EDUS positively. Since floods raise distress level due to displacement during particular season every year it is expected to be detrimental for household education. However, it is found insignificant in the present study. Similarly remoteness is found to be insignificant. WWP positively influences

EDUS and the coefficient is significant. In other words households with presence of working women have higher standard of education as captured by EDUS. Since educated women are more likely to seek for jobs outside home, it is expected that they would motivate the young age members (strictly less than 17 years) of the households to continue primary or secondary education. Moreover, WWP raises PCI of the household and the MPCE of the household leading to greater purchasing power and finally higher demand for basic education for children. Moreover, working women have greater exposure to the immediate surroundings, have higher awareness and consciousness and hence are in a position to judge the socio-economic value of basic education. Hence school drop outs or discontinuance of basic education is unlikely to influence households having WWP.

The family dummy is found insignificant implying being a joint family does not significantly affect EDUS. Main road connectivity with village positively influences EDUS although coefficient is significant at 11 per cent. This variable captures connectivity of the village with nearby towns which implies that households under better connectivity find it easier to send their children and young age population to school (Secondary and higher secondary). Arguably EDUS should determine sex ratio in the household. But when sex ratio is kept as a regressor it can be examined whether greater number of females per male inside the household raise, lower or keep EDUS unchanged. Table 4.63 shows that sex ratio does not influence EDUS significantly. Thus educational attainments of the household may be termed as gender neutral in the present study.

Dependency ratio is found to negatively influence EDUS and the coefficient is significant. Higher dependency ratio is an indicator of low purchasing power per capita, higher financial burden and liability of the working members and hence lower priority to household education. Moreover, dependency ratio also captures the distress level of the household and over dependence or working members.

Indebtedness is also an indicator of chronic poverty and financial distress. It is also indicative of low purchasing power. Higher indebtedness is expected to influence EDUS negatively. However it is found insignificant in Model-II. Agricultural dummy is found negative and sig-

nificant. This implies being an agricultural household has a negative impact on EDUS. Agricultural households in the present sample may be belonging to the lower income classes with uneconomical size of land holdings. These households have limited purchasing power and comprise of around 65 per cent of total sample households. Thus this dummy variable is expected to be negative. MNREGS dummy is given '1' for households where at least one household member has participated in job under MNREGS in the last six months and '0' for others. Since MNREGS job card holder households represent the BPL section this dummy variable is expected to influence HES negatively. In table 4.63 MNREGS dummy is negative and significant implying MNREGS households have lower education attainments which is expected. Both electricity and LPG are indicators of purchasing power and socio-economic status which should influence EDUS positively but are found insignificant in Model-II A. After dropping insignificant variables, Model-II is re-estimated and the results are presented under Model-II B in table 4.63.

Heteroskedasticity Test: White

F-statistic	0.251802	Prob. F(8,442)	0.7775
Obs*R-squared	0.506451	Prob. Chi-Square(8)	0.7763
Scaled explained SS	1.060803	Prob. Chi-Square(8)	0.5884

White heteroskedasticity test conducted in Eviews verifies that the residuals are homoscedastic and heteroskedasticity is absent in the data.

Table 4.63: Regression Results – Determinants of Education Score (EDUS) of Tiwa Households (N=442)

Explanatory Variables	Model-II A				Model-II B			
	B	SEB	t-ratio	p-value	B	SEB	t-ratio	p-value
MPCE	0.27	0.04	6.75	0.00	0.28	0.03	9.33	0.00*
Health Score	0.17	0.07	2.43	0.02	0.18	0.07	2.51	0.01*
Housing Score	0.83	0.16	4.98	0.00	0.89	0.15	5.79	0.00*
Flood Dummy	-0.72	0.56	-1.28	0.20	-			
Distance from Nearest Urban Centre	0.13	0.85	0.15	0.96	-			
Women Workforce Participation	0.58	0.28	2.02	0.04	0.48	0.28	1.72	0.03**
Family Type	-0.15	0.40	-0.37	0.70	-			
Main road Connectivity with Village	0.52	0.33	1.57	0.11	-			
Sex ratio (members)	0.02	0.08	0.25	0.97	-			
Dependency Ratio	-0.04	0.01	-4.00	0.00	-0.05	0.01	-5.00	0.00*
Indebtedness	0.29	0.26	1.09	0.27	-			
Occupation in Agriculture Dummy	-1.46	0.64	-2.27	0.02	-1.39	0.62	-2.22	0.02**
MNREGS Dummy	-0.03	0.01	-3.00	0.02	-0.04	0.01	-4.00	0.00*
Electricity Connection Dummy	0.10	0.50	0.19	0.84	-			
LPG Dummy	0.11	0.47	0.22	0.81	-			
Constant	12.43	1.63	7.62	0.00	11.37	0.96	11.87	0.00

	Model-II A		Model-II B	
R-square	0.79	Akaike criterion	R-square	0.80	Akaike criterion
Adjusted R²	0.78	Hannan-Quinn	Adjusted R²	0.79	Hannan-Quinn
Log-likelihood	-1060.96	Schwarz criterion	Log-likelihood	-1063.64	Schwarz criterion
F-statistic	107.62	Durbin-Watson statistic	F-statistic	215.98	Durbin-Watson statistic
P-value (F)	0.00		P-value (F)	0.00	

Model-II A: Akaike criterion 4.88, Hannan-Quinn 4.94, Schwarz criterion 5.04, Durbin-Watson statistic 1.18

Model-II B: Akaike criterion 4.85, Hannan-Quinn 4.89, Schwarz criterion 4.94, Durbin-Watson statistic 1.17

Notes: Dependable variables - Households Education Score.
A dash (-) refers to the situation where corresponding insignificant variables are dropped.
*, ** Significant at 1 and 5 per cent level respectively.

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

Model-III: Determinants of Health Score (HS) of Tiwa Households

The result of Model-III is presented in table 4.64. The empirical result shows that the explanatory power of the regression equation as measured by R^2 is significantly high ($R^2 = 0.85$). It implies that about 85 per cent of the variation in the dependable variable (Health Score) is due to the explanatory variables taken in our model and the remaining 15 per cent is due to other unmentioned variables. The adjusted R squared value was 0.84. This indicates that 84 per cent of the variance in the dependent variable is explained by the variations in the independent variables. The test of significance (F-test) is accepted at the 1% and 5 % level of significance.

In model-III, insignificant variables are sex ratio, indebtedness, distance to nearest urban centre, family type. All these variables are dropped from Model-III A and Model-III is re-estimated and estimated results are presented under Model-III B. Finally significant variables are included in Model-III B. Result indicates variables per capita consumption expenditure, housing education score, housing score, women workforce participation and electricity connection dummy have positive and statistically significant determinants of households heath score (HS).

MPCE positively influences households heath score (HS) which is expected as MPCE directly measures purchasing power of the households. EDUS is positive and significant implying that households with greater educational attainments have better health indicators. Education creates awareness and consciousness which influences the household to adopt hygiene habit, safe sanitation, child immunisation and maternal and child care. Housing score is positive and significant implying that better living condition, physical infrastructure, area enjoyed per capita has a positive impact on household health. Better housing quality in the form of quality of construction, availability of piped water, modern sanitation and bathing facility protect members from external environment comparatively more than what is expected in traditional tribal ways of living.

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Flood dummy is negative and significant implying that recurrent floods lead to physical displacement of members ultimately leading poorer SOL and exposure to the health hazards as unsafe drinking water and sanitation along with irregular and insufficient food.

Remoteness as captured by district from the nearest urban area is negative and significant implying household located in remote areas have poorer health score. This further implies government delivery system in the area of health through government hospitals, rural health centre and medical teams responsible for complete immunisation has largely failed in the remotest corners of the selected districts.

Presence of working women in the household positively and significantly influences household health quality. Households with working women are expected to have higher levels of education and awareness thus commitment towards better living.

The family dummy is negative but insignificant implying being a joint family does not influence of health quality of household's members. Similarly remoteness and sex ratio are both insignificant in explaining household health score (HS).

Dependency ratio is found to have a negative and significant coefficient implying households with higher dependency ratio have lower health score. Higher dependency ratio leads to greater financial distress and lower purchasing power. Moreover backward households are expected to have higher household size and higher dependency ratio leading to poorer health care for individual members. Indebtedness is found to be statistically insignificant.

Agricultural dummy is negative and insignificant implying being an agricultural household has a detrimental impact on HS. Agricultural households are expected to have lower MPCE, greater exposure to environmental hazards since working members are exposed to direct heat and rain. Moreover agricultural households are expected to have lower education and awareness resulting in poorer health score.

Since income under MNREGS adds to household income and hence enhances the purchasing power as measured by MPCE, it is kept as a regressor in Model-III. Since this coefficient is found to be negative, it may be influenced that households having some earning from MNREGS have poorer health status which is expected on the basis of their economic background. Electricity connection dummy is positive and significant which implies households having electricity connection have better health score. Similarly LPG dummy is positive and significant implying that LPG users have better health standards.

Heteroskedasticity Test: White

F-statistic	1.756587	Prob. F(10,442)	0.1860
Obs*R-squared	3.470767	Prob. Chi-Square(10)	0.1763
Scaled explained SS	4.520801	Prob. Chi-Square(10)	0.1043

White heteroskedasticity test conducted in Eviews verifies that the residuals are homoscedastic and heteroskedasticity is absent in the data.

Table 4.64: Regression Results – Determinants of household level Health Score (HS) of Tiwa Households (N=442)

Explanatory Variables	Model-III A				Model-III B			
	B	SEB	t-ratio	p-value	B	SEB	t-ratio	p-value
MPCE	0.0005	0.0002	2.33	0.01	0.0005	0.0002	2.96	0.00*
Household Education Score	0.06	0.02	2.27	0.02	0.07	0.02	2.89	0.00*
Housing Score	0.56	0.08	6.58	0.00	0.58	0.08	7.25	0.00*
Flood Dummy	-0.89	0.19	-4.56	0.00	-0.88	0.19	-4.61	0.00*
Distance from Nearest Urban Centre	-1.48	0.23	-6.38	0.00	-1.57	0.22	-7.15	0.00*
Women Workforce Participation	0.37	0.19	2.00	0.04	0.38	0.18	2.12	0.03**
Family Type	0.07	0.05	1.44	0.32	-			
Main road Connectivity with Village	0.09	0.19	0.47	0.63	-			
Sex ratio (members)	-0.01	0.05	-0.20	0.75	-			
Dependency Ratio	-0.02	0.01	-2.00	0.01	-0.03	0.01	-3.00	0.01*
Indebtedness	0.09	0.15	0.56	0.57	-			
Occupation in Agriculture Dummy	-1.36	0.38	-3.55	0.04	-1.31	0.27	-4.83	0.00*
Income earned Under MNREGS	-0.05	0.04	-1.25	0.92	-			
Electricity Connection Dummy	1.44	0.29	4.86	0.00	1.52	0.28	5.26	0.00*
LPG Dummy	0.46	0.27	1.70	0.08	-			
Constant	3.62	1.07	3.38	0.01	2.82	0.72	3.88	0.01

Model-III A				Model-III B			
R-square	0.84	Akaike criterion	3.82	R-square	0.85	Akaike criterion	3.81
Adjusted R^2	0.83	Hannan-Quinn	3.89	Adjusted R^2	0.84	Hannan-Quinn	3.85
Log-likelihood	-829.2	Schwarz criterion	3.98	Log-likelihood	-831.96	Schwarz criterion	3.90
F-statistic	145.06	Durbin-Watson statistic	1.26	F-statistic	258.28	Durbin-Watson statistic	1.27
P-value (F)	0.00			P-value (F)	0.00		

Notes: Dependable variable - Health Score.

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

*, ** Significant at 1 and 5 per cent level respectively.

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

Model-IV: Determinants of Housing Quality Score (HQS) of Tiwa Households

The empirical result presented in table 4.65 shows that the explanatory power of the regression equation as measured by R^2 is significantly high (R^2 =0.90). It implies that about 90 per cent of the variation in the dependable variable (housing quality score) is due to the explanatory variables taken in our model and the remaining 10 per cent is due to other unmentioned variables. The adjusted R squared value was 0.89. This indicates that 89 per cent of the variance in the dependent variable is explained by the variations in the independent variables. The test of significance (F-test) is accepted at the 1 per cent and 5 per cent level of significance.

In model-IV, insignificant variables are distance from nearest urban centre, family type, main road connectivity, income earned under MNREGS. All these variables are dropped from Model-IV A and Model-IV is re-estimated and estimated results are presented under Model-IV B. Finally significant variables are included in Model-IV B. The regression result of this model is shown in table-4.65. In this regression model, housing quality score is used as dependant variable. Coming to determinants of housing quality score, it is found that MPCE has a positive and significant impact on housing quality score which is expected as higher the purchasing power better would be the housing quality and physical living standard.

Flood dummy is negative and significant implying that if the household comes from flood affected region or is located in a flood affected region, it has a lower HQS. In other words, recurrent floods in a region lower HQS which is expected as floods destroy immovable property along with agricultural land among many other assets. This implies if the sample household is located in a flood affected region, it is likely to have poor housing quality and hence lower HQS. It is important to calculate the cost of relocation, reconstruction of the house and loss of employment along with loss of other assets in order to estimate total financial loss due to floods for a household located in a flood affected region.

Women work participation in gainful economic activities raises the household's income, which can help to have the better housing amenities. Dependency ratio has negative and significant impact on housing quality score. More dependents indicate less space for per member

and more crowding of the household. So, dependency ratio has negative impact on housing condition.

Agricultural dummy is negative and insignificant implying being an agricultural household has a detrimental impact on housing quality score. Agricultural households are expected to have lower income, so these households are expected to have lower housing status and housing amenities. Thus, it has negative and significant impact on housing quality score among Tiwas of Morigaon and Nagaon districts of Assam.

Heteroskedasticity Test: White

F-statistic	0.955597	Prob. F(8,442)	0.3934
Obs*R-squared	1.962059	Prob. Chi-Square (8)	0.3749
Scaled explained SS	2.869385	Prob. Chi-Square (8)	0.2382

White heteroskedasticity test conducted in Eviews verifies that the residuals are homoscedastic and heteroskedasticity is absent in the data.

Table 4.65: Regression Results – Determinants of Housing Quality Score (HQS) of Tiwa Households (N=442)

Explanatory Variables	Model-IV A				Model-IV B			
	B	SEB	t-ratio	p-value	B	SEB	t-ratio	p-value
MPCE	1.18	0.12	9.83	0.00	1.22	0.13	9.39	0.00*
Flood Dummy	-0.92	0.25	-3.68	0.00	-0.91	0.25	-3.63	0.00*
Distance from Nearest Urban Centre	-0.02	0.03	-0.67	0.46	-			
Women Workforce Participation	1.04	0.31	3.33	0.00	1.16	0.35	3.29	0.00*
Family Type	-0.26	0.13	-2.00	0.65	-			
Main road Connectivity with Village	0.07	0.13	0.51	0.61	-			
Dependency Ratio	-0.06	0.03	-1.91	0.07	-0.09	0.04	-2.27	0.03**
Occupation in Agriculture Dummy	-1.20	0.19	-6.32	0.04	-1.32	0.21	-6.29	0.04**
Income Under MNREGS	0.21	0.23	0.89	0.37	-			
Constant	-0.42	0.15	-2.83	0.97	-0.43	0.19	-2.26	0.61
	R-square	0.90	Akaike criterion	2.16	R-square	0.90	Akaike criterion	2.12
	Adjusted R^2	0.89	Hannan-Quinn	2.26	Adjusted R^2	0.89	Hannan-Quinn	2.17
	Log-likelihood	-214.02	Schwarz criterion	2.41	Log-likelihood	-216.31	Schwarz criterion	2.26
	F-statistic	121.46	Durbin-Watson statistic	1.28	F-statistic	230.29	Durbin-Watson statistic	1.27
	P-value (F)	0.00			P-value (F)	0.00		

Notes: Dependable variables- Housing Quality Score (HQS).
A dash (-) refers to the situation where corresponding insignificant variables are dropped.
*, ** Significant at 1 and 5 per cent level respectively.

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

Model-V: Determinants of Households Quality of Life Index (HQLI) of Tiwa Households

The empirical result shows that the explanatory power of the regression equation as measured by R^2 is significantly high (R^2 =0.77). It implies that about 86 per cent of the variation in the dependable variable (monthly per capita consumption expenditure) is due to the explanatory variables taken in our model and the remaining 23 per cent is due to other unmentioned variables. The adjusted R squared value was 0.76. This indicates that 76 per cent of the variance in the dependent variable is explained by the variations in the independent variables. The test of significance (F-test) is accepted at the 1 per cent and 5 per cent level of significance.

The regression result is shown in table 4.66. In this regression model, household level quality of life index is used as dependant variable. Presence of working women, availability of electricity, income earned under MNREGS, LPG dummy and reading habit of news-paper by any one member of the household have positive and significant impact on the households level quality of life index. It shows that an additional increase of these variables raises household's level quality of life index.

The OLS regression results of the determinants of HQLI among sample Tiwa households are presented table 4.66. The regressors in no form are incorporated in the HQLI formula. In other words, none of the regressors are used as HQLI indicators or its constituents. As observed in the other model, flood plays detrimental role in determining household quality of life. In other words, households located in floods affected regions are more distress than others and hence this coefficient is negative. Moreover, the flood dummy is statistically significant. Alternatively, it can be said that occurrence of floods reduces HQLI. Distance of the household from the nearest urban centre which is proxy for remoteness has negative and significant coefficient. This implies households located in remote areas have poorer HQLI. This is serious issue from the point of view of success and penetration rate of central and state economic projects and schemes in remote areas of the state. In other words, the governmental delivery mechanism in the more remote areas seems to have failed as remoteness plays a significant negative in determining HQLI.

WWP at the household level plays significant role in determining HQLI. This implies presence of working women in the household raises HQLI significantly. On the other hand it may be said households without women would have significantly lower HQLI levels.

The family type dummy which assigns '1' to joint families is found to be positive and significant at 16 per cent. Somehow joint families have higher HQLI. This may happen in traditional farming households or peasant where ancestral land holding is collectively cultivated by all families residing in the household. However, if joint families break up married sons with their nuclear families move out of ancestral property leading to land fragmentation, uneconomical sized agricultural holdings and hence resulting in subsistence farming. The present sample consists more of farm households as a result of which nuclear families in agriculture are likely to have smaller holdings compared to joint families. However, joint families are not expected to higher HQLI in semi-urban non-agricultural households who are either engaged in the service sector or are business owners.

Motor able roads connectivity with the village in which sample household is located positively influences HQLI but the coefficient is insignificant. Sex ratio influences HQLI positively but this coefficient is found to be insignificant. However dependency ratio is negative and significant implying higher the number of non-working members per earning member higher is the distress level of the household, since lower is the purchasing power and resources enjoyed per capita leading to poorer standard of living and HQLI. Indebtedness is insignificant but has positive influence of HQLI which is economically meaningless. However it is dropped in Model-VB as it is insignificant.

The agricultural occupation dummy is negative and significant implying that being an agricultural household has a negative influence on HQLI implying that agricultural households have lower HQLI. Since agriculture as an occupation is primitive or backward characterised by traditional seeds, small size of holdings, traditional inputs and mono cropping due to lack of irrigation during non monsoon period creates agricultural economically unsustainable from the point of view of maintaining life with minimum acceptable level of purchasing power and

hence quality of life for household members. Income earned under MNREGS is positive and significant in explaining HQLI. Since MNREGS work participation adds to family income, consumption and purchasing power it has a positive influence on HQLI. Unlike that in the previous regression both electricity LPG connection have significantly positive impacts on HQLI.

Newspaper reading habits can be used as a proxy for educational attainments in the household as well as socio-economic status of the household members. This coefficient positive and highly insignificant implying education, awareness and consciousness positively influence HQLI among sample Tiwa households. Coming to district dummy which puts Morigaon equals to '1' and '0' for Nagaon, the coefficient is negative and significant only at 6 per cent but not at 5 per cent. This implies sample Tiwa households located in Morigaon have poorer HQLI compared to those located in Nagaon. Since Morigaon is highly flood affected and since the sample households are mostly agricultural it may be said that regular displacement, crop loss and other assets loss due to recurring floods in Morigaon results in lower HQLI for households.

Heteroskedasticity Test: White

F-statistic	2.434583	Prob. F(10,442)	0.1008
Obs*R-squared	4.661703	Prob. Chi-Square(10)	0.0972
Scaled explained SS	5.025718	Prob. Chi-Square(10)	0.0810

White heteroskedasticity test conducted in Eviews verifies that the residuals are homoscedastic and heteroskedasticity is absent in the data.

Table 4.66: Regression Results – Determinants of Household Quality of Life Index (HQLI) of Tiwa Households (N=442)

Explanatory Variables	Model-V A				Model-V B			
	B	SEB	t-ratio	p-value	B	SEB	t-ratio	p-value
Flood Dummy	-0.12	0.02	-5.81	0.00	-0.12	0.02	-5.92	0.00*
Distance from Nearest Urban Centre	-0.001	0.0003	-3.65	0.01	-0.001	0.0003	-3.82	0.01*
Women Workforce Participation	0.033	0.010	3.10	0.01	0.03	0.01	3.00	0.01*
Family Type	0.021	0.015	1.39	0.16	-	-		
Main road Connectivity with Village	0.0041	0.012	0.32	0.74	-			
Sex ratio (members)	0.0002	0.0003	0.80	0.42	-			
Dependency Ratio	-0.0007	0.0003	-2.11	0.03	-0.0007	0.0003	-2.11	0.03**
Indebtedness	0.008	0.010	0.78	0.43	-			
Occupation in Agriculture Dummy	-0.055	0.024	-2.30	0.02	0.05	0.02	2.44	0.01*
Income earned under MNREGS	0.0007	0.0003	2.12	0.03	0.00076	0.00036	2.11	0.03**
Electricity Connection Dummy	0.061	0.01	3.28	0.01	0.06	0.018	3.47	0.01*
LPG Dummy	0.074	0.018	4.00	0.01	0.07	0.018	4.06	0.01*
Regular Reading Habits of Newspaper	0.082	0.017	4.61	0.00	0.083	0.017	4.69	0.00*
District Dummy	0.026	0.011	2.36	0.06	-			
Constant	0.45	0.05	8.52	0.00	0.48	0.04	11.7	0.00
	R-square	0.77	Akaike criterion	-1.58	R-square	0.77	Akaike criterion	-1.59
	Adjusted R²	0.76	Hannan-Quinn	-1.53	Adjusted R²	0.76	Hannan-Quinn	-1.55
	Log-likelihood	364.02	Schwarz criterion	-1.45	Log-likelihood	363.25	Schwarz criterion	-1.49
	F-statistic	109.72	Durbin-Watson statistic	1.08	F-statistic	143.00	Durbin-Watson statistic	1.07
	P-value (F)	0.00			P-value (F)	0.00		

Notes: Dependable variables- Household Quality of Life Index (HQLI).
A dash (-) refers to the situation where corresponding insignificant variables are dropped.
*, ** Significant at 1 and 5 per cent level respectively.

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

4.4.2 Binary Logit Regression Analysis

A logistic regression, an alternative econometric technique, is used to determine the main so-cio-economic determinants of women participation in economically gainful activities. In particular, the aim of model-VI and model-VII is to determine the factors that explain the probability of women being participate in economic activities.

Model-VI: The dependent variable of this model is binary in nature (dependent dummy variable) which assumes value 1, if at least one woman in the household is currently engaged in any income earning activity or is employed (self-employed included), and '0' otherwise.

In model-VI, insignificant variables are monthly per capita income, distance from the nearest urban centre, family type, age of the principal earner, number of children. All these variables are dropped from Model-VI A and Model-VI is re-estimated and estimated results are presented under Model-VI B. Finally significant variables are included in Model-VI B.

Table 4.67 depicts that the signs of the coefficients of Size of household, Dependency Ratio, Occupation as Agriculture and allied, Education of the Principal Earning Member, and Debt Burden are positively significant. It signifies that these variables positively affecting the probability of women participation in economic activities. The dependency ratio and size of household are positive significant showing that the probability of women participation in economic activities is high in case of the large families with high dependents. The educated principal earning member has a positive and highly significant impact on women's participation decision. Again the educated PEM are status conscious and they want to live a better quality of life. Further they desire to educate their children in better way. Considering these facts, educated principal earning member allows women members to participate in the active labour force to raise their family income for facing the emerging economic challenges. Again, the probability of women participation in economic activities is positive and significant if the principal earning member of the household is engaged in the agriculture and allied activities. They can participate actively in all agricultural and its related operations and traditionally these are a female's job. Processing of food grain is exclusively a woman's job. In order to support financially, they help their partners in agriculture and allied activities. Debt

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burden has also positive and significant impact on women participation in earning activities. To reduce and to solve the debt burden on family, women want to do economic activities. So, the probability of women participation in economic activities is positive who have the debt burden in their family.

Presence of land reduces the probability of women participation in economic activities. The coefficient of variable land holding (LH) turns out to be negative, but significant. The reason may be that more land is considered as an asset and so also the major source of income in rural area. Thus income effect is negative since as income increases, women desire to stay at home to look after domestic issues. Thus woman belonging to more rich families are less likely to participate in labour force. It is evident that the probability of women participation in economic activities is negative if the household is affected by flood. Flood damages cultivation and so all those who are engaged in cultivation don't have any work to do in flood affected area. Hence it has a negative impact on the probability of women participation in earning activities among selected Tiwas of Morigaon and Nagaon districts of Assam.

Model-VII: This model targets the working age-group women in the selected Tiwa households. In other words, all working age group women in all the 442 households were considered in Model-VII. The number of women in the 16-64 years age group stands at 532. Some additional variables which are not included in model-VI also included in model-VII. All insignificant variables are dropped from Model-VII A and Model-VII is re-estimated and estimated results are presented under Model-VII B.

The results of model-VII are presented in table 4.68. The results depict that the variables such as Per Capita Household Expenditure, Dependency Ratio, Level of Education, distance from the nearest urban centre (Remoteness), and Debt Burden have positive and significant relation while, land holding, flood dummy have significant negative impact on women participation in economic activities. More household expenditure raises the probability of women participation in economic activities. Years in formal education also has positive influence on women work participation. Education makes women to find the right way to participate in earning activities. More education brings changes in the cultural norms and patterns of life of the Tiwa women to make them economically independent, to organise themselves to form strong groups so as to analyse their situations and conditions of living, understand their rights

and responsibilities and to enable them to participate in economic activities and so also to contribute to the development of women and the entire society. Another important finding about women participation is the distance from district head quarter has positive and significant impact on women work participation. In interior areas Tiwa women are found engaged in agriculture and different allied economic activities. So remoteness doesn't reduce the probability of women participation in economic activities. The dependency ratio has positive significant impact indicating that the probability of women participation in economic activities is high in case of high dependents. Dependency ratio raises the probability of woman participation in economically gainful activities.

The result of model-VII indicates that flood reduces the probability of woman participation in economic activities. Floods destroy crops and other agricultural production. It reduces the opportunity of agricultural workers to work in farming. Presence of land also reduces the probability of women participation in economic activities. The coefficient of this variable is negative and significant. It is fact that higher the land holding, higher is the level of economic empowerment of the household and lower is the distress level. Thus, it has negative impact WWP. Indebtedness has a depressing impact on household's economic condition and so also standard of living. In order to add to the family's income and to reduce the debt burden on family, women want to participate in economically gainful activities. Thus, debt burden raises the probability of women participation in economic activities. Hence, it has positive and significant impact on WWP among selected Tiwas of Morigaon and Nagaon districts of Assam.

Table 4.67: Binary Logit Estimates of the Determinants of Women Workforce Participation (WWP) at The Households Level (N=442)

Explanatory Variables	Model-VI A			Model-VI B		
	Coefficient	Z-statistics	P-value	Coefficient	Z-statistics	P-value
Monthly Per Capita Household Income	0.0001	0.12	0.90	-	-	-
Size of the Household	1.05	2.74	0.01	0.64	2.87	0.01*
Dependency Ratio	0.20	4.30	0.00	0.19	4.94	0.00*
Years of Formal Educational of the Principal Earner	3.84	2.90	0.01	3.28	2.99	0.01*
Occupation in Agriculture Dummy	35.20	2.69	0.01	29.96	2.65	0.01*
Land Holding	-0.77	-4.56	0.00	-0.71	-4.99	0.00*
Family Type	-0.01	-0.78	0.43	-	-	-
Age of the Principal Earner	0.02	0.36	0.71	-	-	-
Number of Children in the Household of 14 years or be-low	-0.65	-1.44	0.15	-	-	-
Time Taken to Reach the Head Quarter	0.10	1.01	0.31	-	-	-
Flood Dummy	-4.40	-3.17	0.01	-3.41	-3.52	0.00*
Indebtedness	2.75	3.14	0.001	2.49	3.39	0.01*
Constant	-46.68	-3.09	0.01	-39.22	-3.12	0.01
Goodness of fit				Goodness of fit		
Log likelihood	-30.89			Log likelihood	-33.61	
McFadden R-squared	0.89			McFadden R-squared	0.89	
LR statistic	544.98			LR statistic	539.55	

Notes: Dependent Variable-Women Working Status.

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

*Significant at 1 per cent level.

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

Table 4.68: Binary Logit estimates of the determinants of Women Workforce Participation (WWP) of working age group women in Morigaon and Nagaon districts of Assam (N=532).

Explanatory Variables	Model- VII A			Model- VII B		
	Coefficients	Z- Statistic	p-value	Coefficients	Z- Statistic	p-value
Monthly Per Capita Household Consumption Expenditure	0.003	2.45	0.01	0.003	2.99	0.01*
Size of the household	0.19	0.63	0.52	-		
Dependency Ratio	0.12	3.86	0.00	0.13	4.47	0.00*
Education of the Working Age Group Women	1.07	3.60	0.00	0.87	4.41	0.00*
Occupation in Agriculture Dummy	2.27	0.67	0.49	-		
Land Holding	-0.61	-5.66	0.00	-0.63	-6.00	0.00*
Family Type	0.003	0.19	0.84	-	-	-
Age of the Working Age Group Women	0.01	0.30	0.75			
Number of Children in the Household of 14 years or be-low	-0.13	-0.35	0.72			
Time taken to Reach the Head Quarter	0.19	2.44	0.01	0.19	2.55	0.01*
Flood Dummy	-6.79	-4.80	0.00	-6.91	-5.32	0.00*
Indebtedness	3.00	3.90	0.00	3.10	4.34	0.00*
Marital Status	0.005	0.006	0.99	-	-	-
Years of Formal Education of Husband	-1.09	-3.02	0.14	-		
Constant	-11.3	-2.72	0.00	-7.87	-3.89	0.01
Goodness of Fit				Goodness of Fit		
Log likelihood	-43.45			Log likelihood	-44.59	
McFadden R-squared	0.86			McFadden R-squared	0.86	
LR statistic	538.14			LR statistic	535.86	

Notes: Dependent Variable-Women Working Status.
A dash (-) refers to the situation where insignificant and multi-collinear variables are dropped.
*Significant at 1 per cent level.

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