3. MATERIALS AND METHODS

3.1. Study area

Manipur extends between 23°80´ N and 25°68´ N latitudes and between 93°0´ E and 94°78´ E longitudes (Fig.1, p. 33) and it has an area of 22,327 sq. kms (Anonymous, 2002). Manipur is one of the hill-girth northeastern states of India and the literal meaning of Manipur is the land of jewels (Singh, 2008). The state is home to different ethnic communities such as *Meiteis* and Muslim (*Pangal/Meitei-Pangal*) in the valley and tribal groups in the hills (Anonymous, 2011).

The state is divided into 9 Districts (Singh, 2010; Anonymous, 2016), now 16 Districts (Anonymous, 2018-19). Out of 9 Districts, five Districts viz., Churachandpur, Tamenglong, Senapati, Chandel and Ukhrul, fall in the mountainous region and the remaining 4 Districts viz., Imphal West, Imphal East, Thoubal and Bisnupur, lie in the plain region (Anonymous, 2016). Mostly Muslim (*Pangal/Meitei-Pangal*) community is inhabited in Thoubal District (25.42 %) which is followed by Imphal East (17.58 %) and Bishnupur (7.87 %). The distribution of population of Muslims in Manipur in 9 Districts is given (Table 1).

Table 1: District-wise population distribution of Muslims of Manipur

Sl. No.	Districts	Muslim Population (%)
1.	Imphal West	4.69
2.	Imphal East	17.58
3.	Thoubal	25.42
4.	Bishnupur	7.87
5.	Chandel	2.14
6.	Ukhrul	0.61
7.	Tamenglong	0.42
8.	Churachandpur	1.05
9.	Senapati	0.34

Source: Anonymous, 2011

3.1.1. Maps showing study area

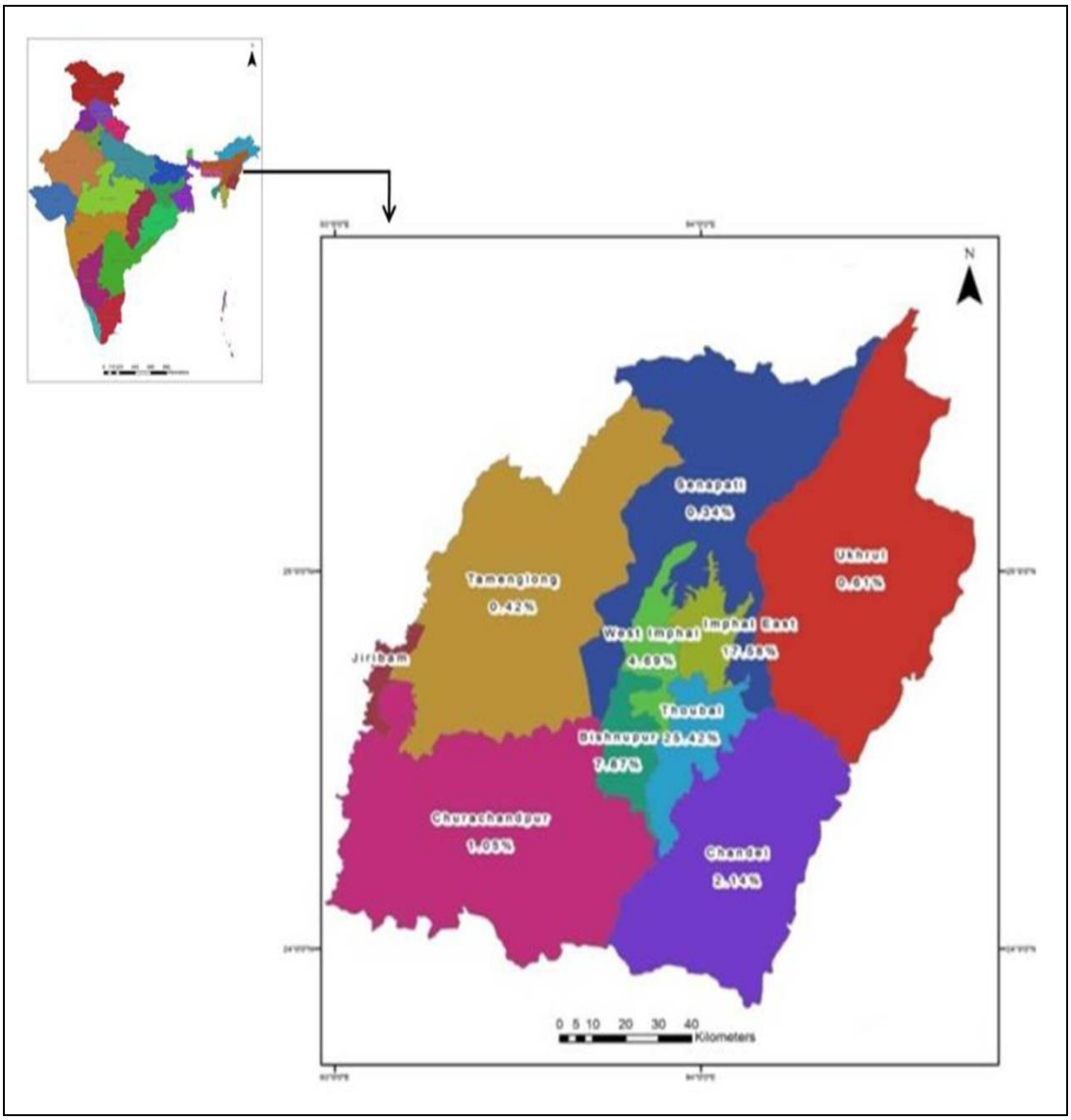

Figure 1: Map of India and District-wise Population distribution of Muslims in Manipur.

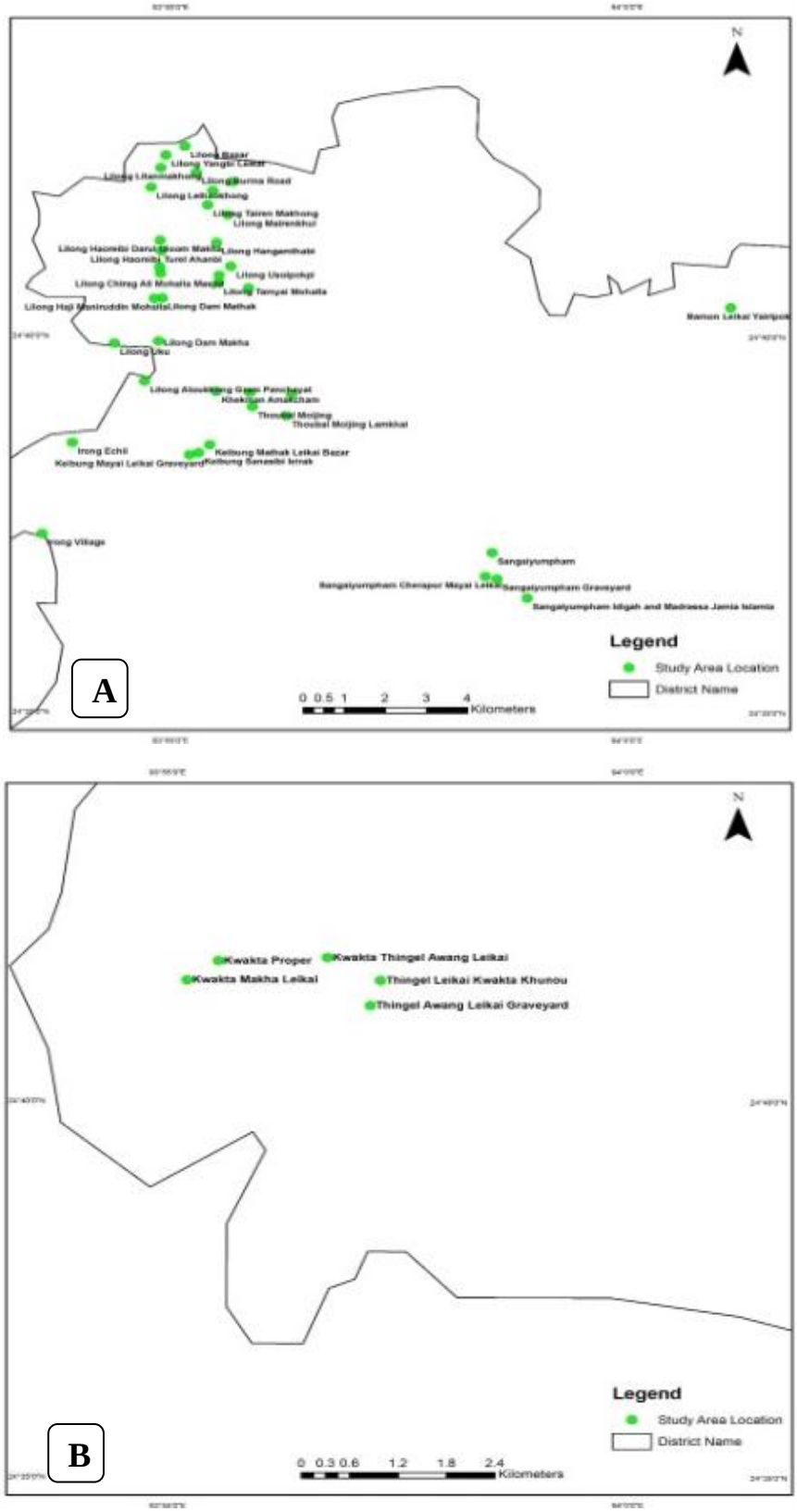

Figure 2: District map (A: Thoubal district; B: Bishnupur district).

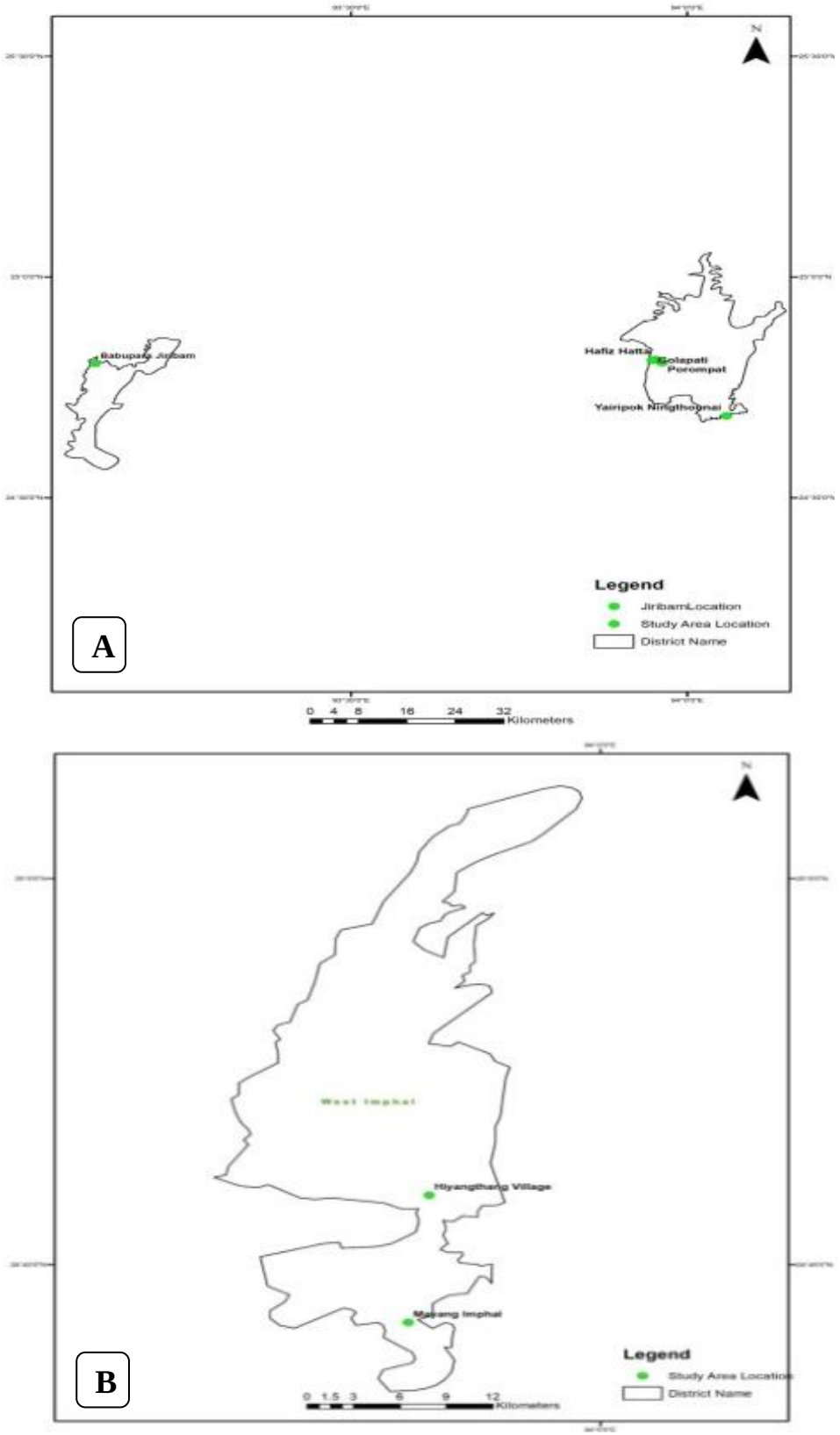

Figure 3: District map (A: Imphal East district; B: Imphal West district).

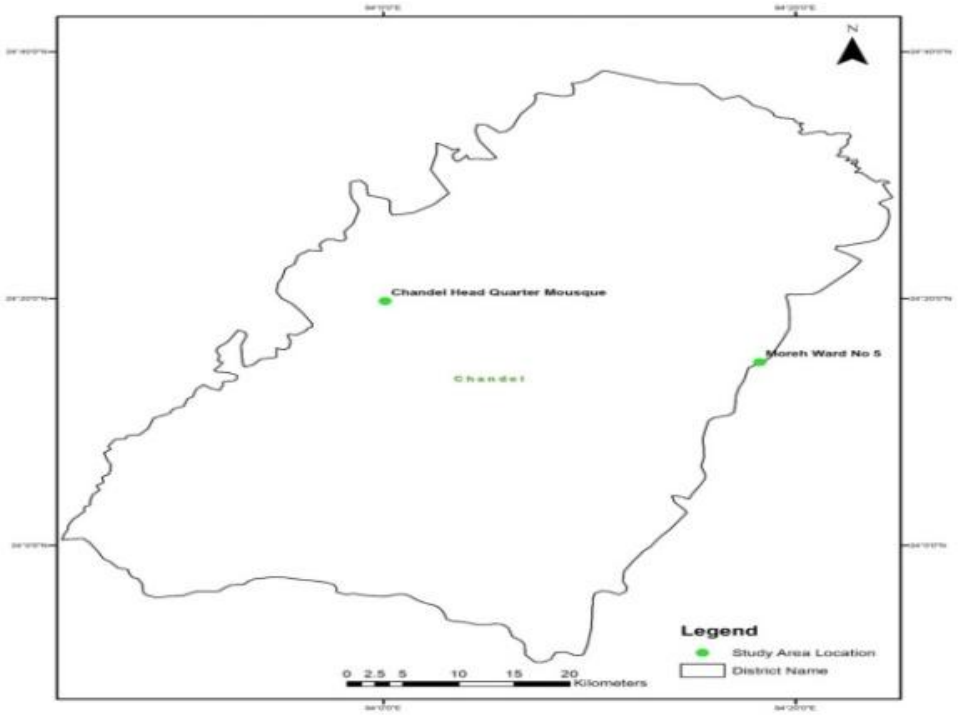

Figure 4: Map of Chandel district.

3.2. Data collection: primary sources

3.2.1. Population: People of Muslim community of Manipur State

3.2.2. Sampling Technique: Multistage sampling.

3.2.3. Sample Size: 172

To collect data in the first stage, five (5) Districts (Fig.2-4, p. 34-36) have been selected purposively out of 9 Districts of Manipur. The selected five Districts were Thoubal District, Imphal East, Imphal West, Chandel and Bishnupur (Table 2). In these five Districts, Muslim community population was more than the remaining four Districts.The remaining Districts having less than 2% of the total population of Muslims were not considered in this research. In the second stage, few villages and urban areas were selected conveniently which are shown in the table 2.

In the third stage, the respondents were selected randomly from the Muslim community households only.172 respondents were interviewed. The selection of unit houses, graveyards, mosque, and religious places were selected on conveniently

Table 2: Different places of data collection.

Sl. No.	Districts	Places of Data Collection (Villages and Urban area)
1	Thoubal	1. Lilong Khunou Graveyard, 2. Lilong Heinoumakhong Mosque, 3. Thoubal Moijing Wangmataba Mayai Leikai, 4. Lilong Tamyai Mohalla, 5. Khekman Amakcham, Masjid Qadimia 6. Thoubal Moijing, Bari Masjid 7. Lilong Chirag Ali Mohalla Masjid, 8. Leingoijil Mosque Campus under Moijing Gram Panchayat, 9. Keibung Mayai Leikai Graveyard, 10. Sangaiyumpham Graveyard, 11. Sangaiyumpham Iddigah and Madrassa Jamia Islamia, 12. Lilong Dam Mathak, 13. Lilong Dam Makha, 14. Sangaiyumpham, 15. Lilong Usoipokpi, 16. Lilong Burma Road, 17. Lilong Bazar, 18. Lilong Leihaokhong, 19. Irong Village, 20. Lilong Sangomshang Suktukarong, 21. Keibung Sanasibi Leirak, 22. Keibung Mathak Leikai Bazar, 23. Lilong Haoreibi Turel Ahanbi, 24. Lilong Atoukhong Gram Panchayat, 25. Lilong Uku, 26. Sangaiyumpham Cherapur Mayai Leikai, 27. Lilong Haoreibi Turel Ahanbi Ubakthong, 28. Lilong Mairenkhul, 29. Lilong Hangamthabi, 30. Lilong Tairen Makhong, 31. Irong Echil, 32. Lilong Haoreibi Darul Uloom Makha, 33. Thoubal Moijing Lamkhai, 34. Lilong Haji Maniruddin Mohalla, 35. Lilong Yangbi Leikai, 36. Lilong Litanmakhong, 37. Bamon Leikai, Yairipok, 38. Lilong Ubakthong, Darul Uloom Makha
2	Imphal East	1. Hafiz Hatta Mosque Campus (City area) 2. Golapati (City area) 3. Porompat No 1 Mosque, 4. Yairipok Ningthounai Mayai Leikai, 5. Babupara Jiribam Municipal Council, Ward No.6
3	Imphal West	1. Mayang Imphal, 2. Hiyangthang Village
4	Chandel	1. Chandel Head Quarter Mosque campus, 2. Moreh Ward No. 5
5	Bishnupur	1. Kwakta Makha Leikai, 2. Kwakta Thingel Awang Leikai, 3. Kwakta Thingel Awang Leikai Graveyard; 4. Thingel Leikai, Kwakta Khunou, 5. Kwakta Proper

Source: Primary data

according to situation and availability of time. The planned methodology aimed to collect maximum information in a correct and consistent way. It involved collection of data in "proforma for field work" (Jain and Goel, 1995). The factors gender, age,

Table 3: Gender break up of Informants

Sl. No.	Districts	Gender				Total Informants	
		Male	PC (%)	Female	PC (%)	Total	PC (%)
1	Thoubal	76	44.18	41	23.83	117	68.02
2	Bishnupur	13	7.55	7	4.06	20	11.62
3	Imphal East	9	5.23	11	6.39	20	11.62
4	Imphal West	3	1.74	0	0	3	1.74
5	Chandel	9	5.23	3	1.74	12	6.97
Total		110	63.95	62	36.04	172	100

Source: Primary data

Table 4: District-wise Age distribution of Informants.

Sl. No.	Districts	Age group	Male		Female		Total	PC (%)
			No.	PC (%)	No.	PC (%)		
1	Thoubal	20-30	16	9.30	7	4.06	23	13.37
		31-40	23	13.37	2	1.16	25	14.53
		41-50	16	9.30	3	1.71	19	11.04
		>50	29	16.86	2	1.16	31	18.02
2	Bishnupur	20-30	3	1.74	2	1.16	5	2.90
		31-40	0	0	2	1.16	2	1.16
		41-50	0	0	0	0	0	0
		>50	7	4.06	2	1.16	9	5.23
3	Imphal East	20-30	0	0	2	1.16	2	1.16
		31-40	5	2.90	4	2.32	9	5.23
		41-50	2	1.16	0	0	2	1.16
		>50	2	1.16	3	1.74	5	2.90
4	Imphal West	20-30	0	0	0	0	0	0
		31-40	1	0.58	0	0	1	0.58
		41-50	1	0.58	0	0	1	0.58
		>50	1	0.58	0	0	1	0.58
5	Chandel	20-30	2	1.16	0	0	2	1.16
		31-40	0	0	0	0	0	0
		41-50	2	1.16	0	0	2	1.16
		>50	3	1.74	1	0.58	4	2.32

Source: Primary data

educational status (Literate, Un-educated, Read Arabic) of the informants were considered while preparing the proforma of field work. They were asked to inform

about the plants used as vegetables, fruits, medicinal plants, tools and its implements, plants used in socio-religious functions etc. (Table 3, 4, 5, 6).

Table 5: Occupation of Informants

Sl. No.	Occupation	Numbers	PC (%)
1	Bamboo based Artisans	21	12.20
2	Traditional healers(Maiba/Maibi)	17	9.88
3	Govt Employee	21	12.20
4	Cultivators or Farmers	57	33.13
5	Students	20	11.62
6	Imam &Cultivators	8	4.65
7	Business Class	9	5.23
8	Jobless	19	11.04

Source: Primary data

Table 6: Educational status of Informants.

Sl. No.	Districts.	Educational status				
		Literate	PC (%)	Un-educated	PC (%)	Read Arabic
1	Thoubal	102	59.30	15	8.72	117
2	Bishnupur	16	9.30	4	2.32	20
3	Imphal East	14	8.13	6	3.48	20
4	Imphal West	2	1.16	1	0.58	3
5	Chandel	11	6.39	1	0.58	12

Source: Primary data

The data collection from 38 places (Thoubal), 5 places (Imphal East), 2 places (Imphal west), 2 Places (Chandel) and 5 Places (Bishnupur) (Table 2) was conducted. Face to face dialogue with informants was conducted by sitting with them; the process recorded 110 male (65.69 %) and 62 female (36.04 %) informants in 91 proforma in which the information was filled on the spot. The total informants District-wise were Thoubal (68.02 %), Bishnupur (11.62 %), Imphal East (11.62 %), Imphal West (1.74 %) and Chandel (6.97 %) (Table 3). The participants and their age in the range of 20-30, 31-40, 41-50 and above 50 were only shown (Table 4). The educational status of the participants' was recorded in the categories i.e. 84.30 %

literate, 15.69 % un-educated and 100 % read Arabic language (Table 6). The information about the uses of plants in different categories of study i.e. Medicinal (M), Food and beverages (FB), Material culture by plants (MC), Socio-religious aspects of plants (SR) and Cultivated plants (CP) was collected. Information was also collected by directly attending to social functions as well. The persons from different occupations were included for the collection of original data. They included *Maiba/Maibi* (Traditional healers) (9.88 %), Bamboo based Artisans (12.20 %), Students (11.62 %), Imams and Cultivators (4.65 %), Government Employee (12.20%), Cultivators or Farmers (33.13 %), Business class (5.23 %) and Jobless (11.04%) (Table 5).

3.2.4. Study of Plants

The morphological study of plants was followed the Bentham and Hooker's classification system. Artificial keys were provided based on macro morphological characters. The character keys of genus (for families having more than one genus) and species (if more than one species) were noted.

The study of plants mainly emphasized on information provided by ethnic Muslim (*Pangal/Meitei-Pangal*) community. The plants were searched at religious places (Mosque campus, Madrassa campus and graveyards), fields, fences, lakes, ponds, hills etc.The visit of herbarium centers was carried out at Gauhati University, Botanical Survey of India (BSI), Shillong and BSI, Kolkata, to compare the plants. The herbariums were submitted to Department of Botany, University of Science and Technology, Meghalaya.

3.2.5. Dicot-Monocot Ratio Calculation

It was obtained by dividing the number of monocot families, genera or species by the number of dicot families, genera or species i.e.

- Family = Total Monocot Family/Total Dicot Family
- Genera = Total Monocot Genera/Total Dicot Genera
- Species = Total Monocot Species/Total Dicot Species

3.2.5. Data Analysis and Tools used for Analysis

The data were collected for the purpose of statistical analysis.

Statistical tools used for Analysis:

(1) **Tabulation**: The presentation of data by means of tables was made. The upper part, footnote of the table was provided a title and its number, figure title, number and sources of the data respecttively. The column and rows were fitted with box heads, nature of the rows and figures.

(2) **Percentage analysis:** This analysis was applied to calculate percentage of gender break up of informants, District wise age distribution of informants, occupation of informants, educational status of informants, plant taxa and habit of plant groups.

(3) **Bar diagram and Pie chart to show the results of the study**: Simple Bar diagrams expressed the magnitude of frequencies in discrete statistical data in visual comparisons. Pie chart showed different angles of qualitative characters highlighting their comparative differences.

(4) **Chi-square (χ^2) test**: It is the most widely used non-parametric test of significance. The Chi-square test is appropriate for situation in which a test for differences between samples is required (Murthy, 2013). Chi-square test is used to compare more than two variables for a randomly selected data. The test is used to test if the two variables are statistically associated with each other significantly. The expected frequencies are calculated based on the conditions of null hypothesis. The rejection of null hypotheisis is based on the differences of actual value and expected value.In the present study the researcher calculated characteristic of attributes of having discrete variables by using chi-square test. The most suitable test for the envisaged hypothesis was to apply Chi-square test (Pearson, 1900; Rana and Singhal, 2015).The following formula was used to calculate Chi-square **(**χ^2) test for independence of attributes.

General computing formula for Chi-square,

$$\chi^2 = \sum (O_i - E_i)^2 / Ei$$

With (r-1) (c-1) degrees of freedom

Where, O_i = Observed frequency
E_i = Expected frequency
r = number of rows and
c= number of columns

3.3. Data collection: secondary sources

The study of folk-songs (Rahman and Kayamuddin,1986; Singh, 1998 and Ahmed and Singh, 2008) and folk-proverbs (Kuber, 1998; Singh, 1996; Ahmed and Singh, 2006) were taken to find use of plants in categories of study i.e. Medicinal (M), Food and beverages (FB), Material culture (MC) by plants and Socio-religious (SR) aspects of plants and Cultivation of plants (CP). In addition to these, "The Science in Folklore" (Klymas, 1978) was consulted in a book, *Folklore in the Modern World* (Dorson, 1978). The techniques of field visits, collection of plants, herbarium preparation (Brainerd, 1971; Rao and Hajra, 1995; Subrahmanyam, 1999) and folk-songs & folk-proverbs (Agrawal, 1997 and Mohanty, 2004) were followed. Some books, flora, encyclopedia and databases were accessed to find taxonomical development of plants(Hooker, 1872, 1874,1875, 1878, 1879,1880, 1881, 1886, 1887, 1890, 1892 and 1897),(Prain, 1903), (Kanjilal *et al.,* 1934, 1936,1939, 1940), (Backer and Bakhuizen, 1963,1965 and 1968), (Roxburgh and Wallich, 1824), (Saldanha and Nicolson, 1976), (Deb, 1981 and1983),(Haridasan and Rao, 1985 and 1987),(Hajra *et al.*, 1996a; Hajra *et al.,* 1996b; Hajra *et al.,* 1996c), (Bremer,2009) (Sharma and Gupta, 2009), Austin (2002), Shu (2010), Anonymous (2013), Anonymous (2015) and Anonymous (2018).