5. DISCUSSION

The total plants studied in this research belong to 52 families, 99 genera and 109 species. The calculated value(s) of Dicot-Monocot ratio of family, genera and species are 1: 0.20; 1:0.32 and 1:0.40 respectively which show dicot outnumbers monocot. Most often used families of plants in different categories of study i.e. Medicinal (M), food and beverages (FB), Material culture (MC), Socio-religious aspects of plants (SR) are depicted using bar diagram (Fig. 5,p. 176).The frequently used families are Poaceae (57 times) followed by Lamiaceae (9 times), Fabaceae (8 times), Arecaceae (6 times), Malvaceae (5 times), Solanaceae (5 times), Zingiberaceae (5 times), Cucurbitaceae (5 times) respectively. It is seen that Poaceae is the most dominant family with greatest number of genera i.e., *Bambusa*, *Coix*, *Cymbopogon*, *Cynodon*, *Dendrocalamus*, *Echinochloa*, *Imperata*, *Melocanna*, *Oryza*, *Saccharum*, *Zea.*The genus *Bambusa* has four numbers of species i.e. *Kingiana*, *Nana*, *Tulda* and *Nutans*. The plant *Hydrocotyle* sp. used to cure kidney stones is speculated to be a new species since the morphological characters of this specimenis not related to others. (However, it is not confirmed yet). The percentage in plant taxa are 78.43 % (Dicot) >17.65 % (Monocot) >1.96 % (Gymnosperms) = 1.96 % (Bryophytes) (Fig. 6, p. 176). The plant groups in different habits are 42 (Angiosperm-herbs) followed by 29 (Angiosperm-Trees), 16 (Angiosperm-Grasses), 14 (Angiosperm-Shrubs), 07 (Angiosperm-Climbers), 01 (Bryophytes), 01 (Gymnosperm-trees) respectively. The habitat-wise number of plants are 99 (Terrestrial) > 09 (Aquatic) > 01 (Epiphytic). The useful parts of plants studied in Medicinal (M), Food & Beverages (FB), Material Culture (MC), and Socio-religious (SR) features are shown (Fig. 8, p.180).

5.1. Medicinal plants

The medicinal benefit of plants has been known to local people because of their belief in traditional healers (*Maiba/Maibi*). The methods of preparing medicines are primitive. The large turn-out of the patients to traditional healers confirms their trust on this practice of healthcare. The patients choose local physicians based on their skills to cure specific diseases. The preparation of traditional medicines have been carried out by –

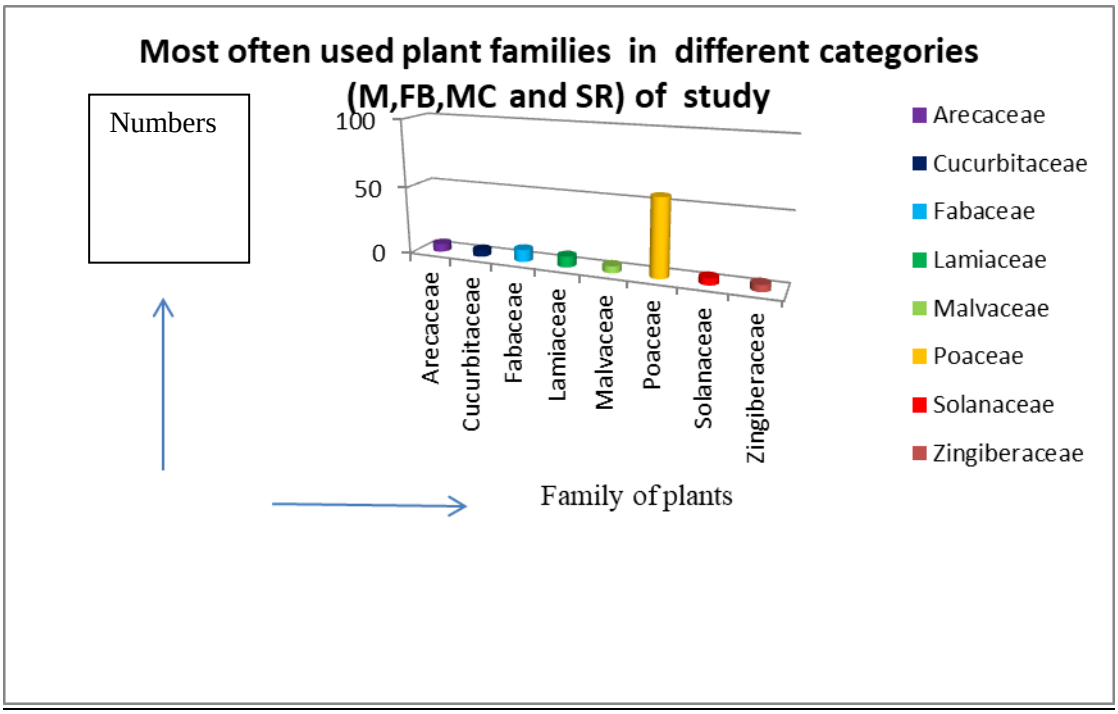

Figure 5: Family of plants frequently used in different categories (FB, M, MC and SR).

Source: Field survey

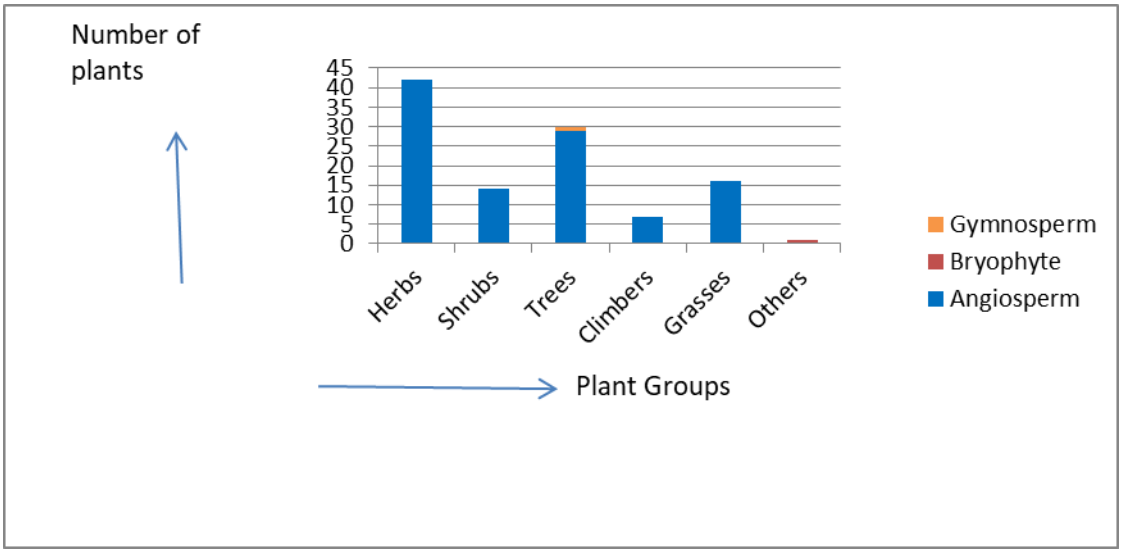

Figure 6: Comparison of Plant groups

Source: Field survey

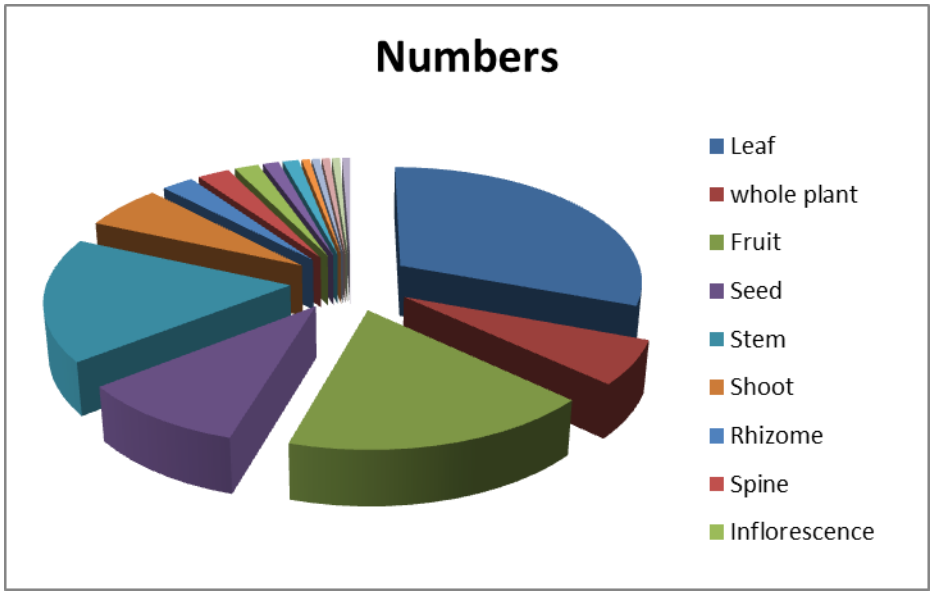

Figure 7: Useful plant parts used in different categories of study i.e. Medicinal, Food & Beverages, Material Culture and Socio-religious aspects.

- the extraction of juice by using traditional mortar and pestle,
- making the decoction of the plants by boiling,
- using water as main solvent,
- maintaining the dose,
- putting additives such as sweetener (honey, sugar and candy), salt and
- giving clear instructions to re-boil the medicines if medicines carry bad odour due to lapse of time.

The plants related to cure diseases are provided (Table 7) with botanical name and families, vernacular names, plant parts used and the associated diseases or health problems. The medicinal plants have been studied with 37 families, 54 genera and 55 species. The important plant parts used are 21 leaves, 10 whole plant, 7 fruits, 5 seeds, 3 stems, 2 rhizhome, 1 curly spine, 1 root, 1 tuber, 1 inflorescence, 1stem epidermis, 1 bamboo-shoot, 1 seed oil, 1 prickly spine. The most often used plant part is leaf (Fig. 7).

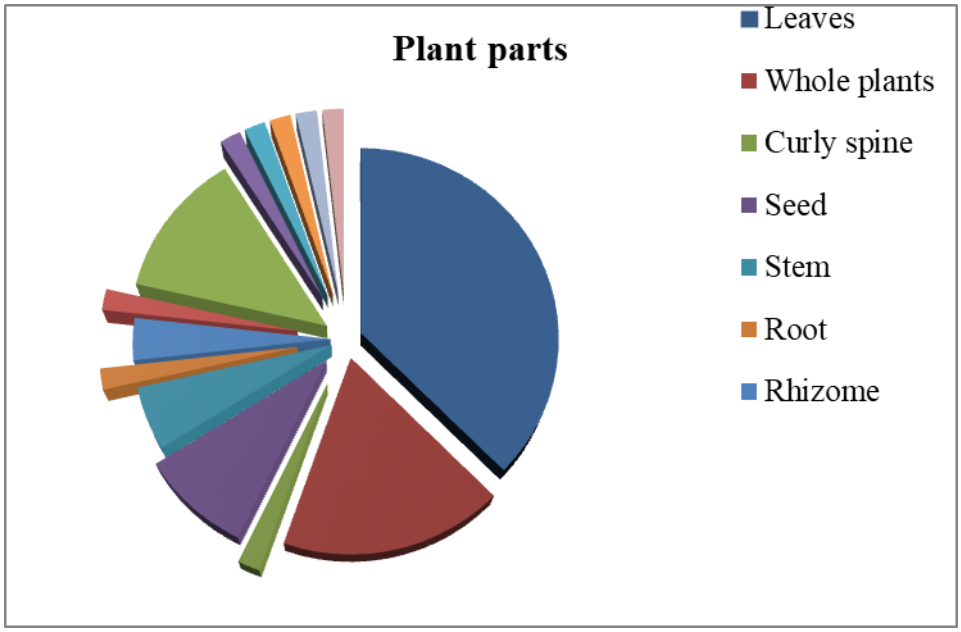

Figure 8: Pie chart showing plant parts used as medicine.
Source: Field Survey

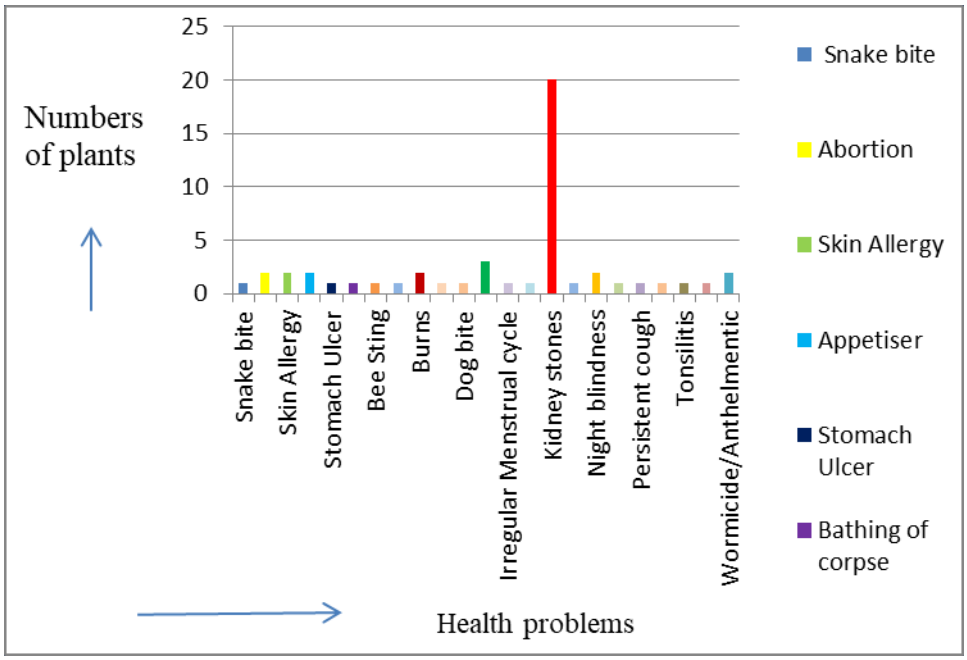

Figure 9: Plants used against health problems.
Source: Field survey

The number of plants used against diseases or health problems are 20 for kidney stones, 3 as antiparasite or germicidal, 2 for abortion, 2 for constipation, 2 as wormicide or anthelmintic, 2 for dog bite, 2 for jaundice, 2 for night blindness, 2 for burns, 2 as appetiser, 2 for skin allergy, 1 for stomach ulcer, 1 for bathing of corpse, 1 for circumcision, 1 for snake bite, 1 for irregular menstrual cycle, 1 for lack of stamina,1 for perforation of ear lobe, 1 for persistent cough, 1 for white discharge of women, 1 forboils, 1 for sunburn,1 for madness (ngaoba), 1 as hallucinogen, 1 for fever, 1 for tonsillitis, 1 for bee sting. Among the medicinal plants, the plants used in the treatment of kidney stones are comparatively more than plants used in treatment of other health problems. This has been shown (Fig. 9, p. 178).

The plants such as *Enhydra fluctuans* Lour (whole plant), *Fragaria nilgerrensis* Schltdl. ex J. Gay (whole plant), *Lindernia ruelloides* (Colsm.) Pennell (whole plant) and *Celtis timorensis* Span. (leaves) are used in the treatment of kidney stones with other plants. Interestingly, a fish, *Fenneropenaeus indicus*is cooked with *Stellaria media* (L) Villto cure stomach ulcer. The plant *Kyllinga brevifolia* Rottb. is useful for the treatment of snake bite and dog bite. The selection of the plant *Fragaria nilgerrensis* Schltd. ex J. Gay (leaves) by local physician is very typical because they select only the plant of 5 pinnate leaves used against kidney stones. They again select only the standing leaves not the drooping leaves of *Osbeckia nepalensis* Hook.f. for the treatment of irregular menstrual cycle; this act can be viewed with taxonomical as well as medicinal significance. The plants were recorded with their medicinal importance for the treatment of numerous diseases or health problems (Ahmed and Borthakur, 2013). The plants identified in this research can be studied further in future to extract chemicals for producing medicines.

The plant *Stellaria alsine* Grimm. is useful in treating cold and the juice of *Enhydra fluctuans* Lour. is used in constipation (Das and Sharma, 2003). The leaf of *Pogostemon plectranthoides* Desf. is used to clean wounds and treat snake bite (Chhetri, 2006). The paste of tuber taken from *Cyperus brevifolius* Rottb. (Hassk.) and seeds of *Sesamum indicum* L is applied externally as ointment on piles (Das *et al.*, 2011). The pulp of the fruits of *Cyperus articulates* L is taken as abortive. The

decoction of rhizomes of *Cyperus corymbosus* Rottb. is taken as contraceptive (Dhiman, 2006). The tubers of *Cyperus rotundus* Rottb.is used to cure body ache (Barua *et al.*, 2000).

The liquid decoction of juice of leaves and tender stem of *Clerodendrum colebrookianum* Walp is taken as a remedy for gastric disorder (Gupta, 2006). Again, the liquid decoction of the root of *Clerodendrum viscosum* Vent. after being crushed is taken for the treatment of dysentery (Bora, 1996). The liquid decoction of root bark of *Clerodendrum multiflorum* (Burm.f.) Kuntze is used as anti-fertility agent (Dhiman, 2006). The plant *Clerodendrum serratum* (L) Spreng is grown as a medicinal and aromatic plant in herbal gardens (Pandey *et al.*, 2005). Likewise, Muslims of Manipur grow medicinal plants in home garden and homestead forest. For example, the *Magnolia macroplylla* L, *Phyllanthus emblica* L. and *Citrus limon* (L) Burm.f. are cultivated in homestead forest. The plant *Mentha arvensis* L, *Hydrocotyle* sp., *Hedychium coccineum* Buch.-Ham.ex Sm., and *Allium ramosum* L have been grown in the front-yard(s) and herbal gardens.

It is reported that the plant *Clerodendrum phlomidis* L is used to cure fever, cough, bronchitis, cholera and anti-fertility (Chhetri, 2006). The leaves of *Clerodendrum colebrookianum* Walp. are boiled and then used to get relief from blood pressure. The decocted liquid of the leaves is used for treatment of diabetes. The young leaves of *Clerodendrum viscosum* Vent. is used against worms (Das and Sharma, 2003). The boiled leaf juice is given to cure cough.The boiled leaf decoction of *Clerodendrum colebrookianum* Walp. is prescribed orally to get relief from high blood pressure (Das *et al.*, 2011).

Clerodendrum serratum L is reported to have hepato-protective benefits (Vidya *et al.*, 2007). *Eclipta* spp. extract is used to cure in urinary bleeding of women (Barua *et al.*, 2000).The plant *Eclipta alba* (L.) Hassk.is used to cure chronic skin diseases (Chhetri, 2006). The juice of the *Eclipta prostrata* L is mixed with 2 teaspoonful of sugar and taken once daily to cure constipation (Das and Sharma, 2003). A decoction prepared by boiling the grounded seeds of *Citrus limon* (L)

Burm.f. in water mixed with a small amount of the seed powder of *Piper nigrum* L is prescribed in typhoid (Dutta and Nath, 1999). The extracted juice of *Mentha arvensis* L is mixed with candy to cure urinary trouble or smooth urination (Singh *et al.*, 2000). The plant oil from *Mentha arvensis* L. is carminative and stimulant (Chhetri, 2006). The stem and leaf of *Mentha spicata* L. is used against cough and stomach trouble (Das and Sharma, 2003). The application of *Tamarindus indica* L in bone fracture, cough, delivery and post natal ailments is recorded (Hosagoudar and Henry, 1996). The root extract of *Momordica cochinchinensis* Spreng. is used in gastric trouble and rheumatism. It is promoter of hair growth also (Islam, 1996). Like in the present research, an infusion of the leaves of *Alternanthera philoxeroides* (Mart.) Griseb is administered to dissolve urinary calculi (Dutta and Nath, 1999). But some plants as *Crataeva nurvala* Buch.-Ham., *Solanum surattense* Burm.f. (Prachi *et al.*, 2009), *Crataeva nurvala* Buch.-Ham. (Bhatt, 2002) and *Solanum surattense* Burm.f. (Bhatt *et al.*, 2002) are useful for calculi treatment. Some plants as Cramp bark (*Viburnum opulus* L), Golden rod (*Solidago* spp.), and Joe-pye weed (*Eupatorium maculatum* L) are found useful for reducing infection, pain and spasm.

It is reported that some plants are usedto cure calculi (Bhatt *et al.*, 2002). These plants are *Corchorus depressus* L, *Solanum surattense* Burm. f., *Ascarantha longifolia* Nees, *Ocimum sanctum* L, *Hackelochola granularis* (L) O. Kuntze etc. There are reports of calculi cure by *Crataeva nurvala* Buch.-Ham., *Pedalium murex* L (Bhatt, 2002). The root decoction of *Boerhavia diffusa* L is useful for treating kidney stones (Pandey*et al.*, 2005). This is reported that wine prepared from red currants is used for calculus afflictions (Sharma and Gupta, 2009).

The rhizome of *Curcuma angustifolia* Roxb. is used as fragrant, tonic and aphrodisiac. The plant *Emblica officinalis* Gaertn. is useful in diabetes, anemia, jaundice, flatulence and grayness of hairs while *Piper nigrum* L is useful in malaria and digestive system. The plant *Syzygium cumini* (L) Skeels is useful in diabetes, diarrhoea and dysentery and *Centella asiatica* (L) Urb. is useful as nervine tonic, carminative and diuretic (Chhetri, 2006). The fruits of *Emblica officinalis* Gaertn. is

used in constipation and piles by Manipuri community (Das and Sharma, 2003). The plant parts viz. stem, bark and leaf juice of *Cinnamomum tamala* (Buch.Ham.) Nees ex Ebern. is useful in the treatment of gonorrhea. The boiled leaf juiceis given during cough (Das *et al.*, 2011).

5.2. Food and beverages

The plants used for food and beverages belong to 27 families, 45 genera and 45 species. The plants have been categorised as staple food (1 plant), vegetables and spices (22 plants), stimulatory (2 plants), fruits (15 plants), beverages (2 plants), animal food (7 plants). The plant parts used as food are fruits (20) followed by leaf (19), shoot (7), stem (6), seed (4), rhizome (2), inflorescence (2), corm (1), bulb (1), root (1), thallus (1) respectively. Some of these plants are *Oryza sativa* L (staple food), *Dendrocalamus giganteu*s Munro (bamboo shoot), *Hibiscus cannabinus* L. (appetiser), *Areca catechu* L (stimulatory), *Cammelia sinensis* (L) Kuntze, *Meyna spinosa* Roxb. ex Link (fruit) etc. Plants used as animal food are *Cynodon dactylon* (L) Pers., *Alternanthera philoxeroides* (Mart.) Griseb., *Imperata cylindrica* (L) Raeusch., *Riccia natans* L, *Saccharum officinarum* L, *Oryza sativa* L *and Echinochloa stagnina* Retz. etc.

The food plants used in folk proverbs are *Oryza sativa* L, *Curcuma longa* L., *Bambusa kingiana* Gamble, *Alocasia macrorrhizos* (L.) G.Don.Schott., *Grewia microcos* L, *Meyna spinosa* Roxb. Ex. Link., *Capsicum frutescens* L, *Averrhoa carambola* L, *Areca catechu* L, *Ipomoea batatas* L, *Musa balbisiana* Colla, *Nelumbo nucifera* Gaertn., *Nymphae pubescens* Willd., *Piper betle* L, *Rhus chinensis* Mill., *Riccia natans* L., *Saccharum officinarum* L and *Tamarindus indica* L etc.

Some food plants associated with folk songs are *Luffa cylindrica* (L) M.Roem, *Cucurbita maxima* Duch., *Hibiscus cannabinus* L, *Solanum melongena* L, *Alpinia allughas* (Retzius) Roscoe, *Curcuma angustifolia* Roxb., *Mangifera indica* L, *Garcinia xanthochymus* Hook.f.ex T. Anderson, *Citrus reticulata* Blanco, *Citrus limon* (L) Burm. f., *Trapa natans* L, *Musa balbisiana* Colla. and *Oryza sativa* L. The animal food associated with folk proverbs is *Riccia natans* L, *Saccharum officinarum*

Land *Oryza sativa* L. The animal foods associated with folk songs are *Oryza sativa* Land *Echinochloa stagnina* (Retz.) P.Beuv. Some animal food recorded in this research are *Cynodon dactylon* (L) Pers., *Alternanthera philoxeroides* (Mart.) Griseb., and *Imperata cylindrica* (L) Raeusch. The plant *Alternanthera philoxeroides* (Mart.) Griseb. (Alligator weed) have been studied in relation to management of mulches to prevent this notorious weed in the agro-fields (Ahmed and Das, 2016).

Pangal Chanam Eromba is a local delicacy among the Muslim community of Manipur. The word Pangal refers to the Muslim community (*Pangal/Meitei-Pangal*), *Chanam* means Garlic (*Allium sativum* L) and the word *Eromba* refers to preparation of curry with ground boiled garlic, onion, ginger, salt and water. Two methods of preparing this curry are *Chanam Eromba* by *Mathak Eromba* and *Makha Eromba*. In the first one it is cooked with mustard oil and in the second method it is prepared without oil. Garlic is known to be cultivated in kitchen garden of *Pangal/Meitei-pangal* community since time immemorial in Manipur. The community believes that the plant is good for health (Ahmed, 2015). The word 'Pangal' denotes Muslims in Manipur and interestingly this word is also associated to a plant called *Pangal Khamen* (*Solanum melongena* L).

Some plants are used by Muslim (*Pangal/Meitei-Pangal*) community as beverages. These plants are *Camellia sinensis* L, *Coffea arabica* L and *Citrus limon* (L) Burm.f. People from this community drink tea 1 to 3 times a day, drinking of coffee is occasional and lemon tea is also occasionally preferred. The domestication of coffee has been recorded.

5.3. Material culture

This research has recorded 8 bamboo species alone and 13 other different plants to make tools (Fig. 10, p. 184). These plants have been used to make 59 tools (Table 8). Altogether 21 plants belong to 10 families, 16 genera and 21 species. The tools have been traditionally used in various enterprises like agriculture & horticulture, fishing, weaving, house building etc. This indicates the use of plants by this community to enhance technological support to raise standard of living.

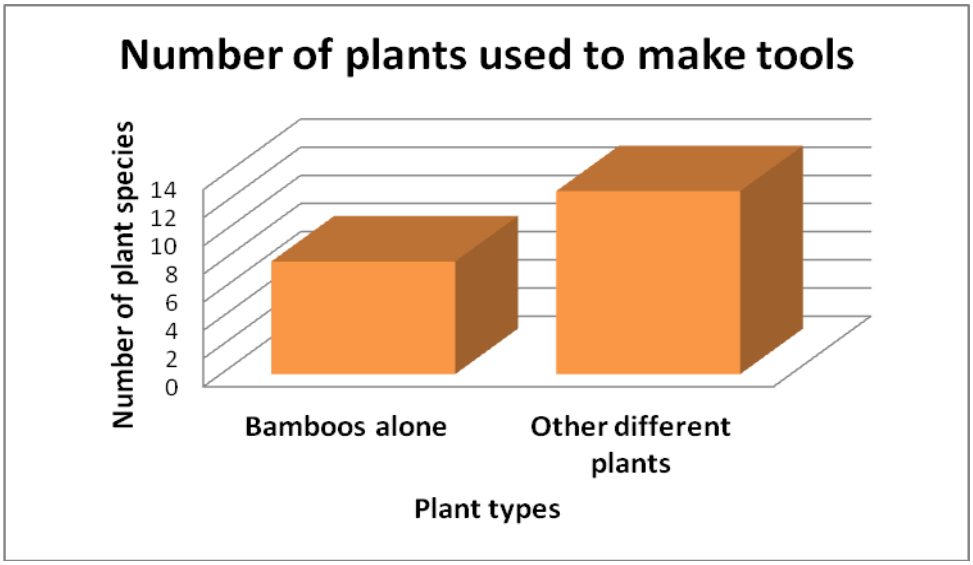

Figure 10: Plant types used in the making of tools.
Source: Field survey

The tools used by farming and agriculture community are cheaper and prepared on sustainable basis. It is indicated that the plants are quickly and easily available. Some easily available bamboo plants are *Khokwa* (*Bambusa nana* Roxb.), *Saneibi* (*Bambusa tulda* Roxb.) *and Watangkhoi* (*Bambusa kingiana* Gamble) etc. These plants have been collected from the surrounding i.e. homestead forest, backyard, near graveyard, riverbanks etc**.** The artisans also depend on the plants brought from the village forests or household forestfor making tools. Earlier 45 species of bamboos from Manipur was reported (Biswas, 1995 and 1988; Biswas *et al.*, 1997). Tomar *et al.* (2009) points out multifarious utility of bamboos in food and nutritional security of the tribal population in north-east India besides industrial value (Tomar *et al.*, 2009).

The artisans using bamboo plants require exact knowledge of preparing raw materials or tools. One most important and challenging part of processing of bamboo is considered to be '*Paya Shiba'* (slicing of bamboos). The skills required of artisans are (1) Cutting of Bamboo, (2) Cutting nodes (*Matangda kakpa*), (3) Slicing bamboo parts (*Wachet Khaiba*, by 4″ to 8″ broad piece), (4) Slicing pieces (*Paya Shiba*). The slicing of pieces of bamboo is the most difficult part of bamboo work. The slices are of 6 types i.e. *Shambal Paya, Polang Paya, Phaklang Paya, Kharai Paya, Thouri*

Paya and Loo Paya/pajeng. The skill and knowledge of artisans has been transmitted traditionally from forefathers to relatives and villagers. This traditional knowledge can also be called Village or Rural based Knowledge (VBK/RBK). Most of the artisans make tools to earn family income. One artisan named Md Jameruddin aged 82 years from Kwakta village, Bishnupur District, is presently working to produce fish traps (*Loo, longup, taijep*), spear (*long*), *paya*(thin slice of bamboo), measuring basket (*thommok*), winnower (*yangkok*), spread-sheet (*phoura*), vegetable basket (*yenshang polang*), baskets (*polang*) etc. to earn a living. The artisans' knowledge and skill of tool making can be collectively employed todevelop small scale industries in the villages for the welfare of the unemployed youth and people in general. This can also benefit the village economy in a profound way (Ahmed *et al.*, 2016).

The need to conserve bamboo by community based approaches, availability of micro-credit for people operating at subsistence level, strengthening inventories of bamboo genetic resources etc. are highlighted by Tomar *et al.* (2009). It is seen that every household in the region generally has some bamboo cultivation and thus, the culture of bamboo is inseparable from the Muslim (*Pangal/Meitei-pangal*) community of Manipur as noted in the study.

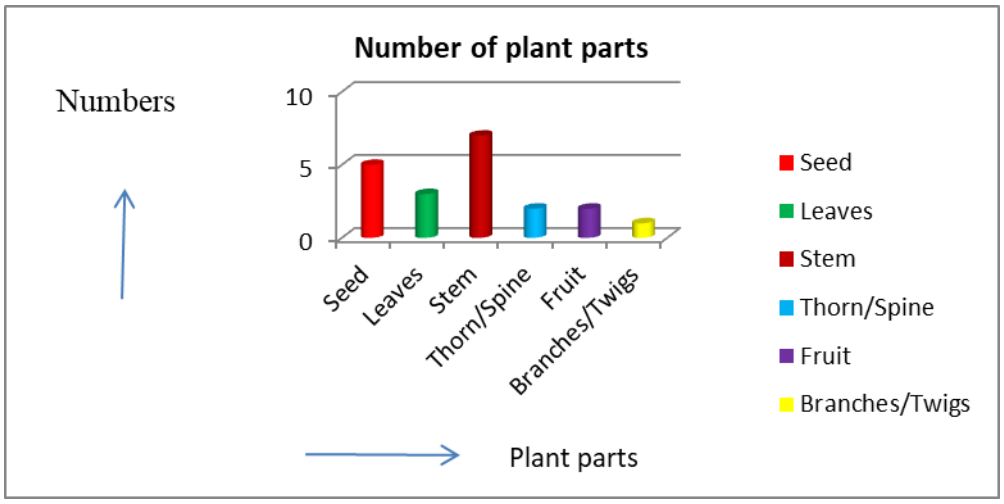

Figure 11: Plant parts used in socio-religious functions.
Source: Field Survey

5.4. Socio-religious aspects of plants

This study has recorded socio-religious functions (Table 9) with 20 useful plants of 10 families, 16 genera and 19 species. The useful parts of the plants are 7 stems, 6 seeds, 3 leaves, 2 Thorn/spine, 2 fruits and 1 twig/branch. The most useful parts are seeds and stems (Fig. 11, p. 185).

The cultivation of *Ziziphus mauritiana* Lam in villages and *Pogostemon cablin* (Blanco) Benth. in graveyards is indication of judicious and wise selection of plants. It is mentioned in a *Hadith* (tradition of Prophet Muhammad) that the prophet once placed a palm twig in a grave. Perhaps this is the reason why the *Pangal/Meitei-pangal* community pursues the same practice of placing *Pogostemon cablin* (Blanco) Benth or branch of *Ziziphus mauritiana* Lam. in graves, following the prophet of Islam. The very fact that palm trees are rare in Manipur implies the *Pangal*'s tradition of placing these plants in the graves. A local modification of using other plants instead of palm trees is seen. Although placing of something on the grave is not obligatory; the Muslim tradition of placing plants in graves encourages cultivation of these plants. In summary, a close connection between *Pangal* cultural rituals towards ecological balance is noted.

Functionally, a curved short spine of *Ziziphus mauritiana* Lam. is sharp yet painless and used for circumcision. A spine of *Acacia farnesiana* (L) Willd is used in perforation of ear lobe and nasal edge of girls. Such practices that use spines can be compared to many similar tribal practices where spines of *Vilva* (*Aegle marmelos* (L) Correa) tree are employed for tattooing bodies (Chaudhuri and Pal, 1997). Berry leaves boiled in water are used to wash dead bodies (Thanvi and Saroha, 2001); this is conformed to *Ziziphus mauritiana* Lam. in the present study. After placing dead body in the shroud, its head should be perfumed. Wet camphor of *Cinnamomum camphor* (L) Nees and Eberm. is rubbed on the forehead, nose, knees and foot (Thanvi and Saroha, 2001). The outfit of the dead is smoked with gum extract of *Canarium strictum* Roxb. (Ahmed, 2003). Regarding useful aspects of seeds, the most useful seeds used to carry out counting of prayers are of the plants *Coix lacryma jobi* Land

Ziziphus mauritiana Lam. In other records, the seeds of *Coix* sp. wasused as staple food for tribals in Madhya Pradesh (Maheshwari, 1996b) and Manipur (Sinha, 1987a). Some tribals from Assam cultivate the same as food (Mittre, 1997). The fruits of *Melia azedarach* L (Persian lilac) were worn as necklace to avert contagious diseases. It was probably introduced in the southern parts of India by Mahometans (Muhammadans); *Melia azadirachta* L (Indian Lilac) was known as *Azaddarakht-i-hindi*, because of its resemblance to the *Melia azedarach* L (Dymock *et al.*, 1976).

The Muslims (Pangal/Meitei-pangal) of Manipurhave used the leaf of *Musa balbisiana* Colla. in many cultural gatherings and feasts. Likewise, two whole plants usually banana plant is erected on either side of the main entrance as decoration in big functions like marriage (Chaudhuri and Pal, 1997). The preparation of *mandaps* for social events involves many species of bamboo and the practice has similarity with other regions (Agrawal, 1997).

5.5. Plants used in folk-proverbs and folk-songs

The study of folk-proverbs and folk-songs reveal various utilities of plants in the community. It is noted, "folklore especially folk-songs, proverbs and tales have references to certain interesting properties on aspects of plants" (Rao and Hajra, 1995). The reference of plants in Manipuri folk-proverbs has been studied in the present research (Table 10). These plants have been found to be potentially useful as medicinal plants, food and beverages, tools, functionally used plants and cultivated plants (Table 12).

Likewise, the utilities of plants have been confirmed by studying Muslim folk-songs (Table 11). It was confirmed that such plants mentioned in folk-proverbs and folk-songs were cultivated in the region (Table 13).

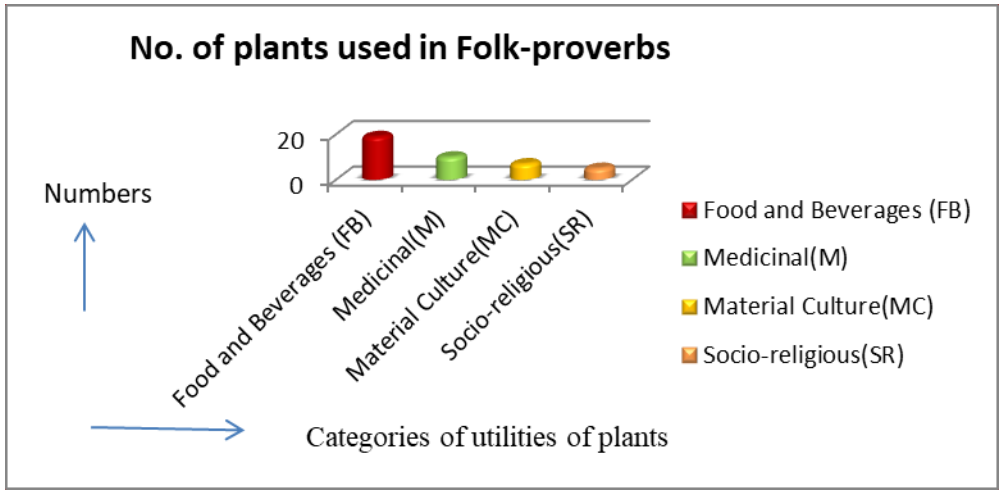

Figure 12: Potentials/Utilities of plants used in Folk-proverbs as Food and Beverages, Medicines, Material Culture and Socio-religious.

Source: Field Survey

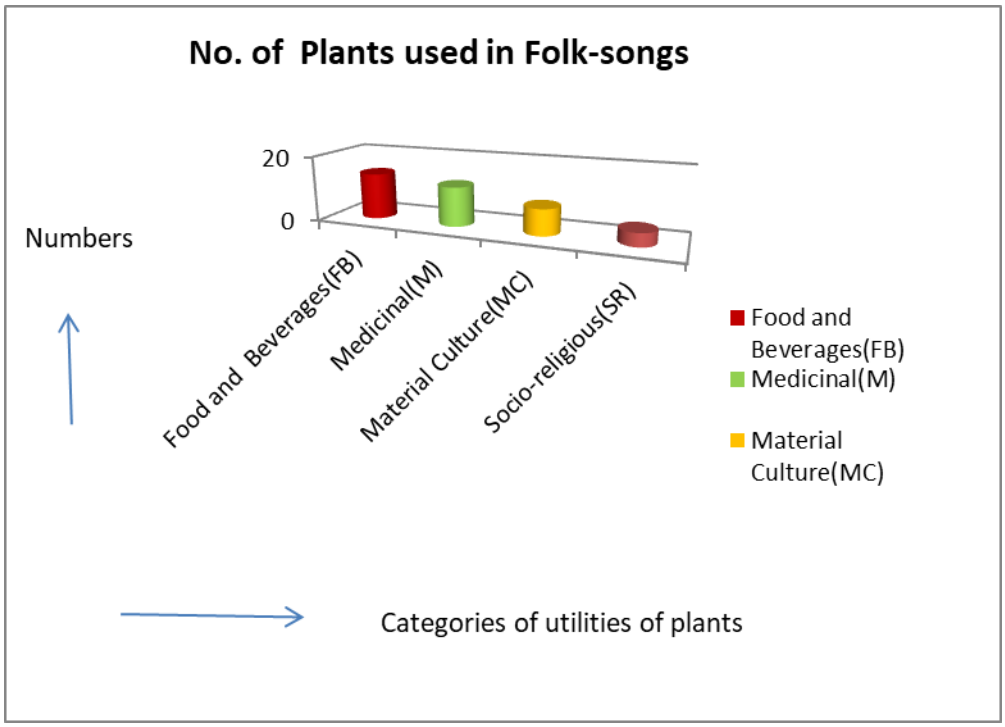

Figure 13: Potentials/Utilities of plants used in Folk-songs as Food and Beverages, Medicines, Material Culture and Socio-religious

Source: Field Survey

The plants used within the categories of medicinal and food and beverages are most commonly used by the community (Fig. 12 and 13, p. 188) followed by plants used in socio-religious scenario. The mention of different plants and their utilities in folk songs and folk proverbs reflect value users have laid on these plants traditionally.

It can be stated that man-plant interaction depicted a clear dependence of humans on plants to improve the general quality of life. On the contrary, there are some plants which are selectively avoided, for e.g. the seeds of the plant *Datura stramonium* L is avoided because they are known to behallucinogenic (*ngaoba* or *tarang chatpa*). They act on the brain to cause delirium (Sharma and Gupta, 2009). This is established within the scope of current research and finds similarity in "the tapping off heritage of ethnobotanical lore" (Schultes, 1960).

The community grows *Shangbrei* [*Pogostemon cablin* (Blanco) Benth] in and around graveyards; the leaves of which are boiled with plain water to wash the dead bodies. The application of perfume was regarded a *Sunnah* (following the life of prophet) and the process of extracting perfume was conducted as a religious ritual called *Asiba-Erujabiba* (bathing of corpse). Hence, the plant *Pogostemon cablin* (Blanco) Benth found significance in religious functions and thus found reference in Muslim folk-songs. The fruit of the plant *Sapindus trifoliatus* L (*Kekru*) is considered a good remedy to curb high temperature in children. Further, research is warranted to understand the chemical composition and mechanism of healing action of some useful plants like *Imperata cylindrica* (L) Raeusch and *Sapindus trifoliatus* L. The plants such as *Sapindus trifoliatus* L (used to cure fever), *Garcinia xanthochymus* Hook.f.ex T.Anderson (fruit) and *Strobilanthes flaccidifolia* Nees (*Kum*) (used to dye cloths) are rare plants (Ahmed and Singh, 2006).

Some plants such as *Heibi* (*Meyna spinosa* Roxb.ex Link.), *Mange* (*Tamarindus indica* L), *Heimang* (*Rhus chinensis* Mill.) bear edible fruits and are found in valleys and hills. These plants along with turmeric (*Curcuma longa* L.), sugarcane (*Saccharum officinarum* L*)*, sweet potato (*Ipomoea batatas* L), banana

(*Musa balbisiana* Colla), bamboo(s) shoot (*Bambusa kingiana* Gamble), chilly (*Capsicum frutescens* L) etc. are potential food plants and has economic value in the market. These plants also find reference in the spoken folk-proverbs of the community (Ahmed and Singh, 2006).

5.6. Hypothesis testing

This hypothesis (H_0) has been applied to denounce any difference in usages of plants used in folk-songs and folk-proverbs. Folk songs and folk proverbs have made mention of plants which have been used by various ways by the community. Therefore, a null hypothesis is considered in this study that there is no difference in the uses of these plants that found mention in folk songs and proverbs. The current study results have been able to classify plants (that found reference in folk song and proverb) based on their utility/purpose: Food and beverages (FB), Medicinal (Med), Material culture (MC), Socio-religious aspects of plants (SR) and cultivated plants (CP). Testing of the hypothesis would help confirm if this difference in utility of plants as identified in study results is statistically significant. The observed (O) and expected (E) values have been calculated (Table 15) by using data (Table 14). The calculated value of $(\chi)^2$ is 0.118. The table value of χ^2 for 4 (four) degrees of freedom at 5 % level of significance is 9.488. The hypothesis has been accepted because the calculated value of $\chi 2$ (0.118) is much lower than the tabulated value (9.488). So we conclude that there is no difference between the various uses of the plants mentioned in Folk-songs and Folk-proverbs.

5.7. Cultivated plants

Plants have been traditionally cultivated based on their usefulness. As a tradition, the seeds or plant parts of useful plants are preserved for future cultivation. Cultivation of plants in small or large scale in kitchen gardens, fields, frontyard, backyard, sideyard, mounted places, homestead forest, graveyards, mosque campuses etc. is carried out traditionally to be used as food and beverage (FB), medicinal (M), socio-religious (SR) and so forth.

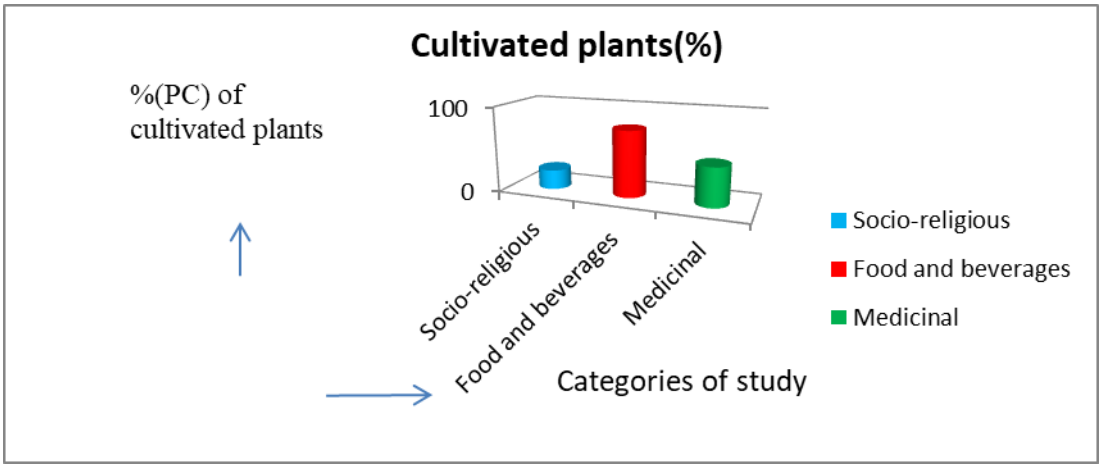

Figure 14: Plants found in folk-proverbs in different category of study with their comparison of cultivated plants by their percentage (%) of cultivation
Source: Field Survey

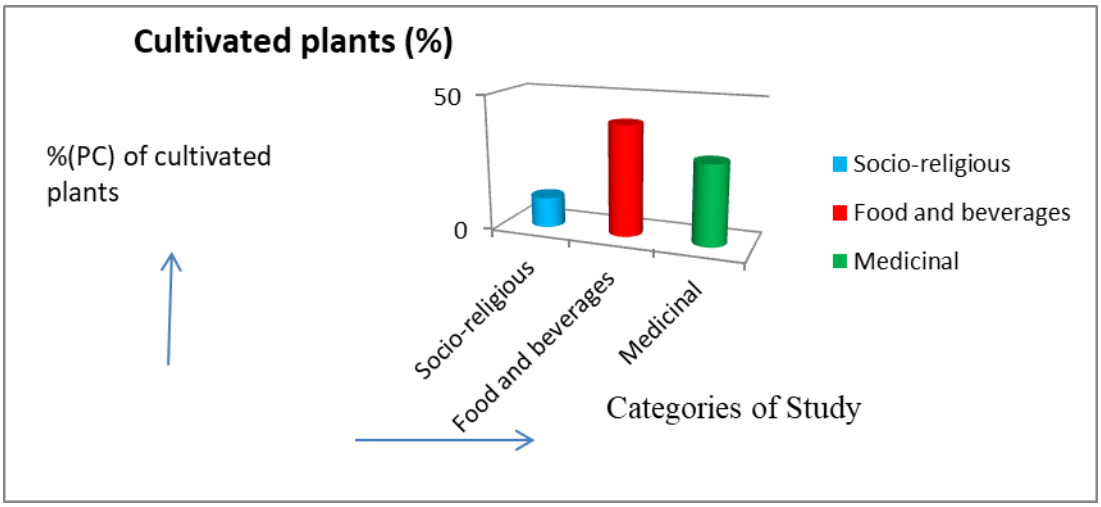

Figure 15: Plants found in folk-songs in different category of study with their comparison of cultivated plants by their percentage (%) of cultivated
Source: Field survey

The category-wise cultivation of plants mentioned in folk-proverbs is found to be 22 wherein Food and Beverages account for 17(77.27 %); Medicinal plant account for 10 (45.45 %) and Socio-religious account for 5 (22.72 %). The category-wise cultivation of plants mentioned in folk-songs is found to be 27 wherein Food and

Beverages account 11(40.74 %); Medicinal account for 8 (29.62 %) and Socio-religious account for 3 (11.11 %) (Fig. 14 and 15, p. 191).

Some plants are both cultivated as well as wild; these plants are:*Avverrhoa carambola* L., *Coix lacryma jobi* L., *Grewia microcos* L, *Imperata cylindrica* L., *Nelumbo nucifera* Gaertn., *Nymphae pubescens* Willd, *Phyllanthus emblica* Gaertn., *Riccia natans* Corda, *Rhus semialata* Murray, *Pinus griffithii* (Hook.f.) Parl, *Ricinus communis* L, *Vanda coerulea* Griff. etc. The useful wild plants have been eventually brought to cultivation.