GENDER ROLES IN LIVELIHOOD ACTIVITIES UNDER SHIFTING CULTIVATION SYSTEM IN MIZORAM

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C E R T I F I C A T E

This is to certify that the Thesis incorporates R. Vanalalauvi's bonafide research and this has not been submitted for award of any degree in this or any other University or Institute of Learning.

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DECLARATION

I, **R.Vanlalauvi**, hereby declare that the subject matter of the thesis entitled 'Gender roles in livelihood activities under shifting cultivation system in Mizoram' is the record of work done by me, that the contents of this thesis did not form the basis for the award of any previous degree to me or to the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in other universities or institutions.

This is being submitted to Mizoram University for the degree of Doctor of Philosophy in Rural Development.

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CHAPTER – 1

INTRODUCTION

The present study attempts to identify gender roles in livelihood activities under shifting cultivation system in Mizoram. The purpose of the study is to determine various activities performed by male and female in shifting cultivation and other livelihood activities with special references to Mizoram.

1.1 Shifting Cultivation: An Overview

The definition of shifting cultivation is given by numbers of scholars, environmentalist, foresters, development practitioners and policy makers, focusing on the technique and land use pattern followed by primitive communities.

Conklin (1961) defines shifting cultivation as "any continuing agriculture system in which impermanent clearings are cropped for shorter periods in years then they are allowed to remain fallow."

Goswami (1990) also explains, "shifting cultivation usually connotes a farming system in which hill slopes are cleared of grasses, vines and small bushes during the dry season; the cut down plants are left to dry for a month or so and burned thereafter. For this reason, the system is also known as slash and burn system of farming."

It is defined by Hodder (1973) as, "an agricultural system which is characterized by rotation of fields rather than crops, by preliminary clearings by 'slash and burn', and by short period of cropping alternating with long fallow periods."

The definition of shifting cultivation furthermore or less stresses on the systematic and traditional technique of cultivation. Therefore, a precise definition of shifting cultivation can be summed up as "a periodic system of cultivation where land is prepared and managed for specific period of time and again left fallow to regain its

fertility naturally." Across the countries, shifting cultivation is also commonly named as swidden cultivation, slash and burn cultivation or jhum cultivation- the term which is more or less similar, referring to the farming system of shifting cultivation. Acharyya et al., (2010) writes about the historical perspective behind the evolution of the term "jhum" as –

"The people who once migrated from the south-west part of China to Kamrup (Assam) used to tell '*chao-thieus'* when referring their original place of above. The very word '*chao-thieus'* assumed many changes in it and it was pronounced in various typical ways depending upon different phonetic changes which took place from time to time. Thus, '*chao-thieus'* was once developed as '*jehe-thieus'* which meant people of high land and since then '*jehe*' was evolved as a word to mean high land; because the people of this group who migrated from western part of China settled in the hilly part of Assam and adopted a type of cultivation in which paddy, turmeric and other useful seeds were sown by the use of *takhaf* (a kind of hoe). Such cultivation was name '*joho-mo'* and this very term '*joho-mo'* sometimes assumed the name jhum which means cultivation in hill slopes by the use of hoe. This may be the reason why in several texts, jhum is also written as jhoom and the jhum cultivators came to be known as jhumias."

Das (2001) also further states that "In the North-eastern states of India shifting cultivation is commonly known as 'jhum.' The cultivators practicing this cultivation are called 'jhumia.' The term jhum prevalent in the North-eastern region of India has most probably evolved from China. "China was known in old days by a general term *chao-thieus,* meaning God's Heaven-land, and even to this day, the people of northern Burma designate China by the general term *thieus.* Chao-thieus was later on shortened to *chuh-this,* and was also pronounced as *zuh-this. Chao, chuh* or *zuh* later on meant

only high hill or high land. Cultivation carried on by picking up a high hill or high land was known as *zuh-moh* or *zuhm cultivation*."

Therefore, it can be conceived with an idea that the term 'shifting cultivation' or 'jhum cultivation' portrayed a systematic and periodic system of hill cultivation practiced widely by the primitive communities in the North-Eastern states and also in some parts of India. As the term implies 'swidden cultivation' or 'slash and burn cultivation' refers to a similar form of cultivation in which an area of land is cleared by cutting and burning and again left fallow to recuperate the natural fertility. Sachchidananda (1989) earlier specified the practiced of swidden cultivation correlating the relevance with shifting cultivation by stating that- "swidden cultivation- so called slash and burn or shifting cultivation is still practiced in many parts of the world by several ethnic groups and tribal communities. Swiddeners are usually identified as hill tribes or mountain people. Shifting cultivation is considered as a primitive form of agriculture and swiddeners are regarded as backward, surviving on subsistence economy."

Shifting cultivation is extensively practiced throughout the world in different countries by different tribal communities. It occupies a distinct place in the tribal economy. It constitutes a vital part of the socio-economic network of the tribal life particularly the hill tribal' economy, which is regarded as the principal sources of livelihood. Shifting cultivation is considered to be the most ancient system of agriculture (Rath, 2015). The practice of shifting cultivation has been traced back to the ancient, dating back to the Neolithic period between the years 13,000 to 3,000 B.C. Sharma (1976) note that the origin of shifting cultivation is often traced back to the Neolithic period dated to 7000 B.C on the basis of archaeological data.

Shifting cultivation is practiced by numbers of tribes throughout the tropical and sub-tropical region of the world. It has been recorded that the primitive communities of 63 countries in Africa, Asia, South America and Central America follow the practice of shifting cultivation as shown in Table 1.1.

Table 1.1: Countries of the world with shifting cultivation

I. AFRICA	
1. Angola	2. Burundi
3. Cameroon	4. Central African Republic
5. Chad	6. Congo (Brazzaville)
7.Congo (Leopoldville)	8. Dahowey
9. Gabon	10. Ghana
11. Gambia	12. Guinea
13. Ivory cost	14. Liberia
15. Malagasy	16. Malawi
17. Mali	18. Kenya
19. Niger	20. Nigeria
21. Rwanda	22. Southern Rhodesia
23. Senegal	24. Sierra Leone
25. Somalia	26. Sudan
27. Tanzania	28. Togo
29. Uganda	30. Burkina Faso
31. Zambia	
II. ASIA	
1. Bhutan	2. Br. Soloman Island
3. Brunei	4. Burma
5. Cambodia	6. Sri Lanka
7. India	8. Indonesia
9. Korea	10. Laos
11. Malaysia	12. Philipines
13. Thailand	14. Vietnam
III. SOUTH AMERICA	
1. Argentina	2. Bolivia
3. Brazil	4. Chile
5. Colombia	6. Ecuador
7. Yunnan	8. Paraguay
9. Peru	10. Venezuela

Table 1.1: Countries of the world with shifting cultivation (Contd..)

IV. CENTRAL AMERICA	
1.Coasta Rica	2. Cuba
3. Guatemala	4. Honduras
5. Jamaica	6.Mexico (Yucatan)
7. Nicaragua	8. Panama

Sources:

1. FAO: African Survey,1965

2. Clark and Haswell: Economics of Subsistence Agriculture, 1996, 1

3. Gourou: The Tropical World, 1961

It has been tentatively estimated by FAO that 200 million people scattered over 36 million square kilometers of the world are depending on shifting cultivation (Rath, 2015). Shifting cultivation is widely practiced with some variations throughout tropical and sub-tropical regions across the countries.

1.2 Shifting Cultivation in India

Shifting cultivation occupies a distinct place in the tribal economy since the form of cultivation is traditional which provides subsistence income to the rural household. In 1983, the Task Force on shifting cultivation (Ministry of Agriculture) estimated that the total area under this system was 14,66,000 hectares (3,86,900 hectares annually) and 4,43,336 tribal families were engaged (Datta et al., 2010). The identified tribes practicing shifting cultivation and the areas of districts/division where shifting cultivation is carried are listed by various authors (Burman and Sharma, 1970; Jayanta, 1977; Jha, 1997 and Rath, 2015) and presented in Table 1.2.

The practice of shifting cultivation is prevalent in the North-Eastern states, Bihar, Madhya Pradesh, Maharashtra, Karnataka, Andhra Pradesh, Kerala, Tamil Nadu, Gujarat and Odisha. Though the cultivation system is spreading extensively in the sixteen states of India, the nomenclature and mode of cultivation of this practice

deviates slightly from region to region, conforming the rites and rituals of forest dwellers.

Table.1.2: Tribes practicing shifting cultivation and where it is practiced in India

Sl. no	State	Tribe Practicing Shifting Cultivation	District/Divisions where Shifting Cultivation is practiced
1	**Assam**	Abor, Chakma, Dimasa, Garo, Jaintia, Karbi, Khasi, Lushai, Lalung, Mikir, Mizo, Naga	Karbi Anglong, North Cachar Hills
2	**Arunachal Pradesh**	Hill Miri, Dafla, Padam, Gallong, Neshi, Sulung, Tagin, Na, Mara, Wancho, Mokte, Tangsa, Gangri, Aka, Monpa, Singpho	Kameng Lohit, Subanisiri, Tirap, Siang
3	**Meghalaya**	Khasi, Garo, Jaintia, War, Pnar	Garo Hills, Jaintia Hills
4	**Nagaland**	Sema, Ao, Lohta, Konyak, Rengma, Tangkhul, Naga	Tuengsang
5	**Mizoram**	Mizo, Kuki, Hmar, Lakher	Lushai Hills
6	**Manipur**	Angami, Hmar, Kabul, Kachanaga, Kuki, Mao, Maring, Tangkhul	Manipur East, Manipur South
7	**Tripura**	Chakma, Garo, Halam, Jhumia, Jamatia, Kuki, Lushai, Mog, Noatia, Reang, Tripuri	Sadar, Khowai, Kailashahar, Kamalpur, Dharmanagar, Udaipur, Sonemura, Belonia, Amarpur Subdivision
8	**Odisha**	Koya, Bhuyian, Bonda, Didayi, Gadaba,, Juang, Kondh, Paroja, Saora	Keonjhar, Sundargarh, Dhankanal, Sambalpur, Kolahandi, Ganjam and Koraput districts and Phulbani, Baliguda, Jeypore and Niyamgiri Hills.
9	**Bihar**	Birjhia, Kharia, Maler, Norwe, Mal Paharia, Sauria, Paharia	Singhbhum Santhal Parganas, Ranchi
10	**Madhya Pradesh**	Agriya, Baiga, Bharia, Gond, Kamar, Konku, Kondaku, Korwa, Manjhi, Madia/ Maria, Majhwar, Mawasi, Pande	Durg, Bastar, Bilaspur, Chhindawara, Balaghat, Raigarh and Surguja.
11	**Gujarat**	Bhil, Konka, Kunbi, Kokanis, Mavehi, Varli	The Dangs and some parts of Surat
12	**Maharashtra**	Bhil, Halkki, Katkari, Kunbi, Kumari-Marahta, Konakari, Mavebi, Maria-Gond, Thakur, Wakkal, Warli	Kolaba, South- Chand division and Janjira Subdivision

Table.1.2: Tribes practicing shifting cultivation and where it is practiced in India (Contd…)

Sl. no	State	Tribe Practicing Shifting Cultivation	District/Divisions where Shifting Cultivation is practiced
13	**Karnataka**	Bettakuruba, Jenururuba, Kumbi, Kunbia, Kumar, Malekudia, Marati, Soliga	Interior mountains tracts of Belgaum of South-Kanara district.
14	**Andhra Pradesh**	Begata, Gadaba, Hill Reddi, Kammar, Khond, Kolam, Kotiyar, Koyas, Kenda-Kanpur, Konda-Reddi, Rond-Dhor, Mali, Manna Dhor, Nayak, Porya, Rena, Samantha, Savara	Adilabad, Srikakulam district Agency tracts, Visakhapatnam east Godavari, West Godavari and Warangal
15	**Tamil Nadu**	Irula, Kadar, Kurumbar, Madigar, Malanaikan, Malasar, Malekudiyar, Naickers, Pulayar, Paniyan, Sholagar	Coimbatore and Nilgiris
16	**Kerala**	Irula, Kurumba, Kurichiyar, Malanaikan, Muduga, Paniyar	Attapaddy Amson, Malabar district and Vaunvanad Taluk

Shifting cultivation is known by different local names in different areas. In larger part of the North-eastern India, jhum is the term commonly used for shifting cultivation. It is called *podu* in Andhra Pradesh, *bewar, penda* or *dahiya* in Madhya Pradesh, *dungar chasa*, *kaman, guda* or *biringa* in Odisha, *Kumari* in hilly region of the western ghats of Kerala and *Batra* in South-eastern Rajasthan. Towards the North-eastern India, local names are used; the Garos in Meghalaya called *bogma*, *lyngkhalum* or *shyrti* among the Khasis, *rit* by the Mikirs of Assam, *tekonglu* by the Ao Nagas of Manipur, *hookuismong* among the Reangs of Tripura and as *tlangramloneih* by the Mizo in Mizoram. The tribal economy and livelihoods are basically dependent on shifting cultivation for their subsistence survival.

Focusing towards the seven states of Northeast India, Forest Survey of India (FSI) worked out on an area under shifting cultivation in North-Eastern Region, 1987-1997 as presented in Table 1.3. During the study period of 1987-1997, areas under

shifting cultivation is largest in the state of Nagaland followed by Mizoram, Manipur, Arunachal Pradesh, Meghalaya, Assam and Tripura.

Table 1.3: Total area under shifting cultivation in NE Region, 1987-1997

Sl. no	State	Area under shifting cultivation (km2)
1	Assam	1300
2	Arunachal Pradesh	2300
3	Mizoram	3800
4	Manipur	3600
5	Meghalaya	1800
6	Nagaland	3900
7	Tripura	600

Source: Forest Survey of India, 1999 (https://www.indiawaterportal.org)

1.3 Shifting Cultivation in Mizoram

The pre-colonial Mizo economy was pre-dominantly agrarian in nature. Apart from domestication of animals, hunting and fishing, agriculture was the backbone of the Mizo economy. Jhum cultivation (or shifting cultivation) was practiced by the Mizos since time immemorial (Vanlalhruaia, 2013). In the present era, the dependency of Mizoram economy on shifting cultivation is still said to be stably relying on agriculture since majority of the households are engaged in shifting cultivation for their livelihoods as reported by NERLP, (2011) that 61.37 percent are cultivators engaged in agricultural activities by practicing shifting cultivation.

Mizos have been agriculturists from the beginning of the 18th century when they made their western trek to the present Mizo hills. They know only the form of farming known as shifting cultivation which forms the major activity of the Mizo economic life even today, wet rice cultivation is reported to be first practiced in the year 1921 by the Mizo residents of Burma which marked the recorded adoption of a new technology in the culture of rice farming among the ethnic group of Mizo (Thangchungnunga, 1997).

The practice of Shifting cultivation is not merely a purposive means of income generating activities that sustained the livelihoods in rural communities; rather the practiced has been deeply rooted with cultural rites and rituals collectively conforms with the rural lifestyle in Mizoram. Sadangi (2008) depicts the livelihoods of rural economy in Mizoram that literally confines in the practiced of shifting cultivation stating that "Mizos are agriculturists, practicing what is known as "jhum cultivation" or slash -and -burn system of cultivation. They cut down the jungles, burn the dried trunks and leaves and then till the soil. All their activities revolve around this cultivation and their festivals are connected with such agricultural operations."

The three main festivals of the Mizos viz. *Chapchar Kut, Mim Kut* and *Pawl Kut* are immensely associated with various stages of shifting cultivation. Lalthangliana (2001) affirms that these festivals were initially celebrated from 1400 - 1700 A.D. relating to the cultural history of Mizos. The evolution and historical background of these festivals portray the shifting cultivation in connection with the timings and activities performed. Therefore, the elements of shifting cultivation have already reflected on the festivals which are observed by the Mizos in one way or the other.

1.3.1 Chapchar Kut

Chapchar Kut which is also a spring festival is the most popular festival of the Mizos and celebrated after completion of the most laborious task of clearing forest and felling trees in late March or early April. The timing of the festival is exclusively observed during drying period of the season as all the households are free from field activities. They prepare themselves in such a way that they are clothed in their best colourful attire with head-gears, feasting in the evening and it is always desirable that the community is in peace and harmony at the time of festival. Families, friends,

neighbours and relatives in a community are always corporative and supportive in order to obtain a successful event. It is desirable that the festival is merry, cheerful and enlightened the people as it is accompanied by various folk dances and singing traditional songs.

1.3.2 Mim Kut

After the harvest of maize, Mim Kut or Maize Festival is celebrated in the months of late August or early September. Rice beer and rice bread is prepared by every households and sample of the year's harvests are consecrated to the depart souls of their families. This is a festival which everyone is to make offering to their dead relatives and is believed that the depart souls of their families are with them on this day of festival.

1.3.3 Pawl Kut

Pawl kut is the last event of festival in a year and is performed in the end of December to celebrate the harvest, end of the year and to welcome the New Year. It is a festival of joy and happiness when all the households are preparing themselves with abundant meat and rice beer for feasting. Children are dressed in their colourful clothes with ornaments and celebrated with joy and merry making.

The element of shifting cultivation is apparently reflected in the community festivals of the Mizos in reference to the time and purpose of celebration. The culture of the Mizos is intrinsically woven with their practice of shifting cultivation. The important festivals of Mizos viz., *Chapchar Kut, Mim Kut* and *Pawl Kut*, are in fact associated with the various stages of shifting cultivation (Sen, 1992).

Through analysing the various districts in Mizoram, a predominant majority of the households are depending on shifting cultivation for their livelihood excepting in the district of Aizawl. Of the 1,54,643 households in the state, more than one half are

depending on shifting cultivation (60%). More than two-thirds of the households in the districts of Champhai (77%), Kolasib (77%) and Siaha (75%) are reported to be shifting cultivators. Likewise, more than two-thirds of the households in Mamit (68%) and Serchhip (68%) are practicing shifting cultivation and one-half of them in the districts of Lawngtlai (62%) and Lunglei (58%) are reported to be jhumias. Moreover, one third of the households of the Aizawl (34%) district depends on shifting cultivation (Statistical Abstract, Agriculture and Minor Irrigation, 2004).

1.4 Gender Roles in Shifting Cultivation

The activities of shifting cultivation are sequential and arduous requiring more spans of time and labour from initial to the final operational steps. The consecutive tasks involved in shifting cultivation are allotment of jhum site, clearing forest/felling trees, preparation of fire lines, burning, re-burning debris/Cross bar setting, sowing, weeding and harvesting.

The facet of shifting cultivation emphasized in the first Mizo Novel 'Hawilopari' (Biakliana, 1993) marks the role performed by women in the Mizo history when referring to the heroine performing her daily activities like working in the jhum for clearing weed and collecting vegetables. On the contrary, men folk in the society are expected to perform heavy duty demanding more energy and efforts related to clearing forest, burning jhum, making hut, collecting materials and construction of house. Roles performed by gender in different stages of shifting cultivation are discussed below:

1.4.1 Allotment of Jhum Site

The land holding pattern in Mizoram is primarily grouped into permanent land and jhum land. Permanent land is a land which is inherited and owned by the family while jhum land is a temporary land which is allotted to the household by the Village

Council (VC) for the purpose of cultivation. Allotment of jhum site is the first activity in shifting cultivation. Jhum land is allotted for a year or more and thereafter left fallow.

A village meeting is held on the day of allotment of jhum site. The head of the family, who are willing to pursue shifting cultivation for the upcoming year should present at the time of allotment and in their absence, female head of the household or a representative attends the meeting. It is earlier identified by the VC members and elders a consolidated block of land for jhum cultivation in the upcoming year on a condition of the soil, terrain and environment. In certain condition, if the village reserved area is short of land, the VC may approach the neighbouring village to access land in its territory. On the day of announcement of the lottery (*lo pawh*), it is common practice that numbers of all the jhumias presents are listed and encoded in a piece of paper which is randomly picked and the coded number in a paper determines the timing for their selection of the plot in a serialized order. There is no restriction on the size of the plot which is solely a matter of the family's choice. The time for allotment of jhum site is usually held between the month of September and December.

1.4.2 Clearing Forest/Felling Trees

Of all the activities in shifting cultivation, clearing the forest is considered as the most arduous task due to which it is exclusively performed by males. Trees and bamboos are cut, and the vegetation is left for drying. In the meantime, felled bamboos and trunks are collect for use in construction and firewoods. Females are hardly involved as the task is highly prone to risk and accident. Clearing forest is usually performed soon after allotment of jhum site during September and December.

1.4.3 Preparation of Fire Lines

Fire lines are prepared prior to burning the jhum. Cutting of firelines is crucial to prevent spreading of fire in nearby vegetation. Matea Pa ('Vanglaini' dated 11th March 2016) points the necessities of cutting firelines prior to burning expressing that preparation of firelines is prerequisite before burning to prevent and control spreading of fire in the forest at the time of burning. The community may organize at a time to operate the activity on a suitable day or the household may perform individually according to their convenience. Preparation of fire lines is usually done one week ahead or even earlier before the burning takes place.

1.4.4 Burning

The correct timing of burning is crucial to ensure rough and complete firing. When the felled trees and bamboos are completely dried, it is then time to burn the plot. A tentative date for burning is drafted by the state government which is enforced by the Local Administration Department through VC in their respective villages. The date of burning the plot is generally fixed on or before 15th of March which is liable to scheduled depending on local weather condition. Meanwhile, late burning increases the risk of fire spreading to the nearby dry vegetation and untimely rains may also result in poor crop performance due to incomplete burning. The VC declares a suitable day for burning and even calls for voluntary labour (*hnatlang)* on the day of burning the jhum plot as there is a need to monitor fire spreading in the nearby vegetation. The reputed and leading daily newspaper in Mizoram 'Vanglaini' (dated 7th & 8th February, 2016), in its editorial column also writes on the cautious precaution to be made by the VC stating that 'The VC in their respective villages should kindly ensure that jhum plot are burnt on a stipulated time that is bound by the state government'. Direction of wind, area of jhum land and drying condition of

the slope matters a lot as to the nature and duration of burning. The activity is regarded as highly dangerous and life threatening in which mostly males are involved.

1.4.5 Reburning/Cross Bar Setting

There may be unburnt materials which are left in the plot at the time of burning that requires re-firing while heavy logs and trunks are collected for use in fencing, construction and firewoods etc. As it is also time to build jhum hut, both males and females are involved in construction of jhum hut while engaging in reburning and crossbar setting.

1.4.6 Sowing

Sowing immediately starts after burning the jhum. It is preferable to sow seeds on the following day of burning or at the earliest as the salinity of ash naturally provides nutrients to the soil that promotes the growth of crops. Seeds of vegetables are mixed and thrown to scatter over the plot while some seeds are sown in a hole about three inches deep where seeds are selectively positioned. Sowing usually starts in the month of March and April in which both males and females are involved.

1.4.7 Weeding

The area of jhum land and scale of weed growth determines the number of weeding rounds required in a season or in one jhum cycle. Generally, three rounds of weeding are performed in a year for the normal growth of crops. The process of weeding involves removal of herbaceous plants, shrubs and grass weeded-out in the field to add organic manure to the soil. The first round of weeding usually starts in April while the last round may start in November. A round of weeding may last for a day or week depending on the extent of growth of weed. The active participation of males and females is required in weeding as it is laborious sequential task.

1.4.8 Harvesting

Harvesting is a period when ripe vegetables and crops are reaped for consumption and marketing. It is the final farm activity in jhum land which is performed by male and female members in a family. Early vegetables such as brinjal, pumpkin leaves, maize and bitter gourd are ready for harvest by May and June while crops requiring a longer period such as rice, bird's eye chilli and ginger are harvested by the end of the year.

1.5 Gender Roles in Livelihood Activities

The livelihood activities in shifting cultivation involved farm and non-farm activities which includes livestock farming, collection of forest resources and engagement in household chores that provides subsistence income and contribution to the family. Thus, active participation of males and females are required for the effective accomplishment of these activities. The specific roles of gender in certain activities are unidentified and unrecognized. It has been regarded that females are more responsible towards activities related to household chores and on the contrary males are highly devoted to decision making process, heavy duty and farm activities. As such, there is no actual division of labour between male and female, but the unidentified roles of gender have not been differentiated so far.

1.5.1 Gender Roles in Household Chores

The household activities are generally classified into cooking, washing clothes, cleaning utensils, household cleaning, caring for children, shopping, household repairing works, collection of firewoods, fetching water and financial management. These are the daily household chores performed by every household. The roles of gender in certain activities may differ based on the composition of family size, traditions, components and availability of work.

Stressing on the gender roles in household chores, a preconception on women's active participation is noticeable whereas males' participation and involvement is assumed to be extremely low. However, stressful and heavy duties like repairing works in the households are performed by men folk and women folk are engaged in other activities related to light duties. It is necessary to identify the role and extend of involvement of gender in performing household chores though there may be a vague perception based on responses to informal enquires on the issue.

1.5.2 Gender Roles in Other Livelihood Activities

The subsistence income of rural household needs to supplement income from other sources of livelihoods other than shifting cultivation. Hence, engagement in livestock farming, collection of forest resources and other livelihood activities are pursued to sustain their livelihoods.

Most of the rural households domesticate pigs and fowl within their premises purposely to supplement income and surpluses for consumption. There are a smaller number of households domesticated cattle and goat. Pork and chicken are favoured by majority of the non-vegetarians in Mizoram as a result most of the households domesticated pigs and fowls purposely over other livestock. It is also the existing tradition and practice that every households manage to include a portion of meat in their weekend dishes in which pork and chicken are the most selected items which result in high consumption rate.

Most of the rural households in Mizoram are partly engaged in these activities in addition to jhum cultivation to supplement their family income in one way or the other. The role of gender in performing these activities are dispersed widely based on the family composition and engagement in other livelihood activities. Moreover,

the similarities and differences in gender roles in livestock farming are identified in one way or the other from the present study.

The geographic location and terrain of the region of Mizoram provides opportunity to the hill people to economically sustain their livelihoods by gathering non-timber produces and forest resources in a particular season. The seasonal availability of these forest resources such as crabs (*chakai*), freshwater snail (*chengkawl*), bamboo shoots (*rawtuai*), amomumdealbatum (*aidu*), caryotaurens (*tum*), wild banana blossom (*tumbu*), rattan (*hruipuizik*), seweg (*telhawng*) and honey (*khawizu*) provide diversified livelihood activities to the jhumias. Forest resources are collected primarily for the household consumption and surpluses for selling in the market. The activities of collecting forest resources are also occasionally organised in a form of amusement in such a way that a group of friends or relatives would club together and stay overnight on the riverside or nearby vegetation for the purpose of collecting seafood and forest resources. The collected forest resources are primarily for consumption and surpluses for sale in the market. The engagement of both male and female in these activities are bound to differ based on the size of family, availability of work in the household and seasonality which are further determined in the study.

1.6 Statement of the problem

The rural economy of Mizoram centres on shifting cultivation as a primary and subsidiary source of livelihood which is evident from the land use pattern evaluated in the year 2004-2005 (Mizoram Forest Department-2006) revealing that about 40,969 hectares of land which is 50 percent of the cropped area of Mizoram was under jhum cultivation. The analysis of gender roles in shifting cultivation and other livelihood activities is imperative to identify the extend of male and female involvement in

various livelihood activities in shifting cultivation. A vivid illustration of women's performance in accomplishing livelihood activities are notified in the writings of J. Shakespear (1975) in his work 'The Lushei Kuki Clans'-

"A Lushai woman has to rise early, fill her basket with empty bamboo tubes and trudge off before daylight to the spring, which is generally some way down the hill. Having conveyed her basketful to the house, she has to work cleaning the rice for the day. The breakfast of rice has then to be cooked and by the time it is ready, her husband is awake."

The line quoted clearly highlights the daily routine performed by women in the household in addition to activities in shifting cultivation.

It is further stated by Lalrinchhani (2004) in her study on socio-economic history of the early Mizo that men folk do not take part in domestic work in the household; rather they directed their energy towards defence, hunting and building houses in the livelihood activities on shifting cultivation. Though there is no such clear division of labour assigned to male and female in performing shifting cultivation and other livelihood activities, it is often perceived that certain activities are performed by males and the others are performed by females. For instances, activities related to heavy manual works are considered as men's duty while light duties are considered to be of women. Moreover, the involvement of gender in activities relating to shifting cultivation and other livelihood activities seem to rely on traditions, family composition, community differences, convenience and availability of work. A problem of study was therefore conceived to find out the gender roles in different livelihood activities under shifting cultivation in the context of Mizoram.

1.7 Objectives of the Study

The study on the topic "Gender Roles in Livelihood Activities under Shifting Cultivation System in Mizoram" aims at achieving the various objectives as follows:

1) To identify existing livelihood activities under shifting cultivation.
2) To identify gender roles in performing various livelihood activities under shifting cultivation.
3) To analyse gender contributions towards household economy under shifting cultivation; and
4) To identify constraints facing gender in performing the livelihood activities and suggest strategies for addressing the identified issues.

1.8 Scope and Limitations of the Study

The study confines itself only to the gender roles in livelihood activities under shifting cultivation system in Mizoram.

The area of the study is only confined to sixteen sample villages in Mizoram namely Noaltlah-II, Lobo, Theiri, Tuisi-I, Andermanik, Rajiv Nagar, Zawlnuam, Tuipuibari, Vapar, Ngur, Ngaizawl, Khawzawl, Phulmawi, Tlungvel, Sailutar and Ratu which were randomly selected based on the households who were practicing shifting cultivation at the time of the study.

The study is limited to certain variables such as socio-economic profile of the respondents, livelihood activities under shifting cultivation and gender roles in livelihood activities under shifting cultivation.

The sampling technique used in the study and the data collected from the sample which is comparatively less in number would not allow to make inferences about the larger population from which the sample is drawn. Presentation and

interpretation of the study findings also have their own limitations as the information collected were based on the simple recall of the respondents.

Chapter – 2

REVIEW OF LITERATURE

Review of literature helps the researcher to understand the theoretical background of the study, provides concrete ideology of the researcher, identifying research gaps that need to be fulfilled in the future and tackle for conceptual issues and addressing them appropriately in the context of the study. However, it is necessary to enrich the study with knowledge and information on literature which are available from recent studies and writings to enhance the nature, scope, historical background and to understand the complexities of the study. Review of literature directs the researcher to simplify the focusing area that needs to be further assessed. Hence, the present chapter attempts to fulfill the research gaps of what had been studied and the areas of studies yet to be undertaken.

The literatures reviewed are divided into three broad sections i.e. the study on shifting cultivation, livelihood activities and gender roles in shifting cultivation and livelihood activities.

2.1 Shifting Cultivation

Erni (2005) expresses that shifting cultivation is not simply a farming technique rather is a way of life of the indigenous people. It is characterized by an alteration between a short span of cultivation and a comparatively long span of fallow; the regular, in most cases cyclical shifting of fields and the removal of the natural vegetation, normally (though not exclusively) by use of fire.

Das (2001) traces the historical background of shifting cultivation, the most primitive method of cultivation which is supposed to evolve during the Neolithic period. "It is known through archaeological discoveries that by about 7000 B.C., there was a fundamental change in man's attitude towards environment and accidentally he

became a food producer from a hunter and food gatherer. Man began to plant, cultivate and improve species of various plants by selection. Of course, domestication of animals like sheep, goat and cattle started side by side. He also highlighted the mode of operation of shifting cultivation in which selection of hill slope is held in the month of February followed by cutting and felling of trees and dried in the sun. In the month of April, the felled trees and bamboos are burnt. The plot of land is made free from debris and heavy logs which are done in May and is followed by sowing seeds. Generally, weeding starts in July and harvesting month's starts from August. The domesticated animals in the Karbi Anglong district in the study area include buffalo, bullock, cow, goat, pig, poultry etc. Weaving, bamboo and cane works, and sericulture are the cottage industries identified which are purposively engaged for their livelihood activities.

Jha (1997) mentions that shifting cultivation is practiced extensively by the forest dwellers in the states of north-east, Bihar, Madhya Pradesh, Maharashtra, Karnataka, Andhra Pradesh, Kerala, Tamil Nadu and Orissa. The steps involved in shifting cultivation vary according to terrain, climate, edaphic condition, distance, manpower and nature of crops. He stratified the sequence of shifting cultivation cycle in Mizoram which are selection and demarcation of site, site preparation, sowing, weeding and harvesting.

Though there are variations in jhum cycle among different states in the north-east, Sachichinanda (1989) stated that the higher the density of population the shorter the jhum cycle. He further mentions that in Mizoram, a period of cultivation is 2 years and fallow period on 2-3 years in bamboo forest zone and 7-8 years in dense forest area which is resulted from his research.

Barman (1990) traces the historical background to the Neolithic period dated by archaeologists to 7000 B.C. The national Commission on Agriculture (NCA), based on the study conducted by Indian Council for Agricultural Research in 1965 estimates that a total number of tribal population depending on shifting cultivation was 26,442,00, total number of tribal households practicing shifting cultivation was 528940 and total area of land utilized for shifting cultivation was 542100 ha.

In the north-east states of Tripura, the tribal communities are practicing shifting cultivation except the tribe of Bhutias and the Chaimals which is recorded by the Tribal Welfare Department (1987). Out of a total of 55049 shifting cultivators' households in Tripura, 21677 (39.3%) households are entirely dependent and 33372 partly dependent on shifting cultivation for their livelihood. The Halams are one of the tribal communities in Tripura engaging in shifting cultivation for their livelihoods. The livelihood activities of the Halams consist of collecting fruits, roots, tubers, roots etc. from nearby vegetation and forest. Fishing and hunting animals and birds in the hills are also common among the tribes. Bothe men and women are engaged in fishing during rainy season. They also domesticate animals as a subsidiary source of income.

Reimeingam (2017) studies the land, system, practice and labour of shifting cultivation in Manipur. His findings highlight that 1.13 percent of the total geographical area was under shifting cultivation in Manipur. Many people continue to engage in shifting cultivation in the hills of Manipur. It is ever increasing due to population growth and without enough employment alternatives. The cycle of shifting cultivation has been shortened due to rapid increase in population. He concludes that the practice of shifting cultivation cannot be completely banned or removed since it is traditionally linked with indigenous ethnic culture.

Rasul et al., (2003) discusses the practices of shifting cultivation in the Southeast Asian countries of Laos. It has been recorded that in the mid - 1990s, 218900 ha of land in Laos was under shifting cultivation, employing a total of 1.24 million people or about one-third of the total national population. Shifting cultivation is the dominant type of agricultural system in the mountains of South and Southeast Asian. The fallow period is shortened recently which is then between 15-25 years of fallow period and currently it is 3 – 5 years of fallow period. As shifting cultivation is the main source of livelihood in Laos, the dominant crops are rice, maize, cassava, soybean, sesame and vegetables. Moreover, shifting cultivators are also partly engaged in livestock farming mainly for household consumption.

An analytical study on the socio-economic life of the jhumias in Lawngtlai district, Mizoram conducted by Lalzarzoliani (2018) summarizes that nearly 60 percent of the respondent's households are categorized in the group of Below Poverty Line and majorities (53%) of the jhumias have annual income between Rs. 25,000 – Rs.75,000. It is further identified that the educational attainment level of the jhumias family is low on which 30 percent of the respondents have not completed primary education while 17 percent are found to be illiterates.

Tripura (2017) mentions that shifting cultivation is widely practiced and is the main source of livelihoods among the tribal groups in Tripura. The jhum cycle has drastically reduced from fifteen years cycle to two years cycle. Traditionally, there are seven operational steps involved in the jhum cultivation viz. selection of site, cleaning the selected site, burning, sowing, preparation of fencing and construction of temporary jhum hut in the plot, harvesting, threshing and storing. The gender roles in different activities are also identified in which cutting and clearing forest is performed by men folk while sowing is done mostly by women folk and sometimes men folk are

also engaged. Weeding or clearing weeds are performed only by female members of the family. The diversified livelihood activities in which the jhumia family supports their family are hunting, collecting tube-root and edible things like ferns, crabs from jungle. Livestock farming and weaving of cloths and baskets are also other livelihood activities performed by the household to supplement their income of the family.

Rath (2015) notes that out of eleven tribal communities in Koratpur region in Odisha, eight tribal communities are following the practice of shifting cultivation. Out of the total respondents' households, 70.74 percent are wholly or partly dependent on shifting cultivation while there is few numbers of landless and also households dependent on settled cultivation. Crops cultivated in jhum land are primarily for household consumption which includes paddy, *ragi, suan, maize, kangu, khedjana* and vegetables. In the same field, Cash crops are also sown by shifting cultivators like oilseeds, pulses, ginger and turmeric in a little quantity. Usually a plot of shifting land is cultivated for two consecutive years. In the first year a variety of crops are grown but in the second-year paddy, millet or oil seed is usually raised. In order to sustain their livelihoods, livestock rearing is being practiced by the tribal and non-tribal communities. They domesticated animals like bullocks, cows, goats and pigs. The research findings state that the sale of animal and animal products only constitutes about 2.5 percent of the total annual income of the sampling households. Therefore, the people of this area are yet to take up animal husbandry on commercial basis. Efforts are also taken by the government to provide 4 goats to each needy tribal family to help them come across the poverty line at 50 percent subsidy.

2.2 Livelihood Activities

The livelihood activities found in the remote rural village of Letlhakane in female-headed households are subsistence agriculture in the form of small vegetable

gardens growing maize, beans, melons, tomatoes, cabbages, onions, carrots, spinach, fruit trees and keeping livestock (goats) and domestic animals. They also engage in informal trade ranging from selling vegetables to selling different products although the shops were very small in size. Activities are initiated according to household resources, availability of labour and the need to provide a living for the households. It is marked that the activities did not offer them security to survive in the future.

Tembo et al., (2014) identify the common livelihood activities of agricultural and non-agricultural activities in Southern province of Zambia which includes field production, livestock sales, gardening, fishing, wage and/or salaried employment (piece work), gathering and sale of forest products (grass, charcoal, honey, wild fruits, wood etc.), crafts (carpentry, mat weaving, black smith, knitting, etc.), beer brewing, hiring out animal draught power (ADP) for ploughing and transportation, selling animal products (milk, meat, eggs, etc.) and trading (sell of groceries and other necessities) and has been concluded that small scale farmers have these diversified livelihood systems to help them cope during times of uncertainties which may include crop and market failures

Datta et al., (2014) classify the farmers' livelihood status in Tripura State of North-East India in which majorities of the household is low followed by medium and high livelihood status. Education, number of family members involved in Jhum, area under Jhum, annual income and material possession has positive significant relationship with livelihood status, whereas family size, fallow period, livestock possession and extension participation have higher positive significant relationship with livelihood status. Area under Jhum and numbers of family member involved in Jhum has contributed most for variation in livelihood status of tribal people.

An analytical study was undertaken by Ifeanyi-obi et al., (2014) on the choices of livelihood activities by the rural dwellers in Southeast Nigeria which reveals that more educated rural dwellers abandon farming for other livelihood activities. Moreover, major socio-economic factors that affect livelihood choice of rural dwellers in the place are age, number of years in school and monthly income. It is further stated that older rural inhabitants were more involved in farming activities.

2.3 Gender Roles in Shifting Cultivation and Livelihood Activities

A study conducted by Dixon (1982) reveals that majority of male in the household decided about the selling of animals while women played substantial role in such decisions. Women took decisions related to care of animals and collection of fodder.

It was also reported by Alli (1970) that women made important contribution to agricultural production in dairy/poultry products and vegetables. Women also operated the farm independently, but their contribution is not accurately recorded due to socio-cultural reasons.

Singh (1981) mentioned that about 70 percent of the farm rural women perform work. They constitute the backbone of the rural economy. They participated in planting, irrigating, manuring, growing vegetables, planting fruits and collecting and drying dung for fuel. Similarly, in Haryana women participated in various agricultural activities such as transplanting, sowing, weeding, harvesting, winnowing and threshing etc. as stated by Sharma (1981).

Bardhan (1983) highlights that women in north and western India did vast amount of work related to farming. Rural women carried out extreme labour and skill intensive operations crucial for crop production and processing.

Participation of women in income generating activities in Coimbatore district conducted by Devadas, Sundaram and Sithalakshmi (1985) conclude that women engaged in poultry, use of agricultural products, making incense sticks, brooms, candles, chalks, fans, pickles, masala powder, baskets, weaving and tailoring for generating the household income.

Rahman et al., (2009) investigates that male and female in cultivation of ginger in Northeast India depends more on the family situation than on gender or ethnicity. However, he identified that both men and women do almost all works from land preparation to seed storage. In a family with more male members, male works in the fields, whereas in families with fewer men, women work equally with men. Role performed by male includes purchasing of seed and ploughing. Both men and women do the hoeing and digging, sowing, planting, manure application and harvesting. Mulching is done mostly by men, although women help as when required. The study also stated that in Sikkim, mother rhizome extraction is done by women, but its selling is done by men. Unlike Meghalaya, Mizoram and Nagaland, women play a significant role in retail selling of ginger.

Nishu (2010) views that the major decision makers in agricultural activities are men even though women perform more agricultural related activities than men. Even they are not consulted at the time of purchase of animals and change of crops.

Tuteja (2000) agrees that in the state of Haryana, female agricultural workers contribute significantly to household economy. He also felt that they lack education, health and other support services and often do not have access to economic resources.

Reports of FAO – ESA (2011) mention that female time use in agriculture varies by crop, production cycle, age and ethnic group. In general, weeding and harvesting were predominantly female activities. The overall labour burden of rural

women exceeds that of men and includes a higher proportion of unpaid responsibilities related to preparing food and collecting fuel and water. Women's participation in rural labour markets varies considerably across regions, but invariably women are overrepresented in unpaid, seasonal and part-time work and found out that women are often paid less than men, for the same work.

A study on status of rural women in Karnataka (Srilatha et al., 1998) highlights that cultivation was the predominant occupation among the women in Karnataka. It must be noted that the cultivation is defined in a way that would ensure that women's unpaid labour would be captured including activities like ploughing, sowing, transplanting, weeding, supervision of agriculture labourers, working on own farm, processing grains for storage etc.

Tiwari (2006) states that among the Khasi community, a matrilineal tribe of Meghalaya, genders role are reflected in the study on cash crop cultivation which denotes that men and women are equally and actively involved in the on-farm activity on shifting cultivation while the responsibility of men in on farm activity increases with the shift to cash crop cultivation. Since Khasi belongs to matrilineal tribe and unlike patriarchal societies, marketing and financial management of the cash crops are performed by women who are also responsible for shopping and management of house, a tradition of matrilineal society. Fire woods are generally purchased from the market which was initially collected by womenfolk from the household.

The findings by Hussain et al., (2011) on "Decision Making Power among Rural Women at Gross-Root Level" concludes that farm women showed low level of participation in household decision making.

Aryal et al., (2010) stress the main challenges of the strict gender division of labour results in a greater workload for women who work two to three hours more per

day than their male partners which is confirmed in the study villages, where the women are involved in planting, weeding, harvesting, and manure transportation, while men do the ploughing and threshing. Women still receive lower pay for the same work, as their work is thought to be lighter. Women's tasks also include, gathering fuel wood, cooking food, fetching water and grass, preparing alcohol, childcare, and care of the elderly while the decision-making process is dominated by men, although they often take suggestions from the women. However, in critical situations the final decision is still made by them.

Mucavele et al., (2016) investigate that women comprise the largest percentage of the workforce in the agricultural sector, but do not have access and control over all land and productive resources. He further noted that women guarantee livelihoods, especially in rural areas. As a result of their great efforts in agricultural production, women's production helps to guarantee their self-sustenance. The major weaknesses of the agricultural sector he mentioned is the production, disposal, preservation, processing and marketing of agricultural products and further recommends that joint efforts should be taken to create favorable conditions in agricultural areas, including the reinforcement of road networks for the transportation of produce from production areas where rural women work, as well as the processing and commercialization of such products.

Baliyan (2014) concludes that women do not enjoy a high degree of autonomy in decision making in the family despite their significant contribution to economic activities from his findings in western region of Uttar Pradesh. Only in purely domestic matters like decoration of house, purchase of domestic goods, making of *chulla/chakki,* marriage of children, etc. women are given freedom to take their own decisions. But

in matters related to children's education and occupation and money related matters they enjoy limited freedom.

Pokharel (1997) identifies that economy of the household is heavily dependent on wage labour. Males are the major actors of the outside wage labour and females are responsible for household works and wage labour within the community. It is further seen that the traditional division of labour is more flexible in poor households. Females have little works in the household chores in comparison to the well-off women. But females of the poor household should take male's responsibility also during the time of male absence from the home. Overall workload of the females is higher than males. Both male and female earnings are used for maintenance of the households.

Aregu et al., (2011) stress that in most rural communities in Ethiopia, women work from dawn to dusk and, in contrast with men, have little time for leisure or socializing. They further conclude that women are not only the major source of labour in the agricultural sector, they are also responsible for the vital tasks of caring for children, the sick and the elderly as part of their household responsibilities. Despite their immense contribution to society, women's productive, domestic and community related activities seem to be undervalued, are often misunderstood and are rendered invisible from official discourse and national statistics. In addition to working at home and on the farm, rural women engage in a diverse range of off-farm livelihood activities. Women are often involved with activities that require dexterity and attention to detail, such as raising seedlings in nurseries, transplanting and weeding. They are also involved with activities closely associated with their household responsibilities, such as storage, processing and adding value.

Chowdhurry (2009) analytical study reveals that women play an important role in farm activities particularly in post-harvest operations, homestead gardening, rearing poultry and livestock farming in Bangladesh. It is further stated that contribution of female labour in different activities as well as in total family income was substantial which is particularly true for low income households. Suggestion have been made in order to enhance women participation in farm and non-farm activities and their contribution to household income, the quality and status of support service like input supply, credit facilities, extension and motivation, need-based training should be improve as well.

The active and regular participation of women in performing household activities and livestock farming is resulted from the research taken by Mihiret and Tadesse (2014) in Yilimana Densa District in Amhara Region, Ethiopia. Food preparation, looking after family members, cleaning house and utensils, washing, childcare and fetching water are the regular activities undertaken by women on regular basis whereas they are occasionally performing shopping household utilities. The involvement of women in livestock farming is seen that majorities of the respondents are regularly participated in cleaning of animal sheds, preparing milk products and gathering dung followed by selling milk and milk products, selling egg, egg collection and selling of poultry.

The different role of rural women in agriculture is presented by Kumar (1995) stating that the agricultural role of women includes sowing, transplanting, irrigation, manure/fertilizer and chemical application, weeding, plant protection, harvesting, threshing, winnowing, storing and marketing. The domestic role of women are cooking food, collecting water, vegetable, fuel wood, cleaning house, utensils, cattle-

shed, child rearing, maintaining poultry and cattle/dairy farm, care for aged and handicapped and maintaining kitchen garden.

Saxena and Bhatnagar (1985) report that in Rajasthan during peak season tribal women spent 14.66 hours on daily activities, out of which 8.24 hours were spent on agricultural work and 6.42 hours on home activities whereas, non-tribal women spent 8.14 hours on farm activities and 7.61 hours on home activities totaling 15.75 hours per day.

Badiger and Rao (1985) find that farm women participated independently more in-home area, while their husband's independent participation was almost the same in both farm and home areas. Joint decisions were high in both areas, being somewhat greater in farm than in home areas.

Kulkarni and Nandapurkar (1991) state that very few rural women (15%) were taking their own decision in respect of purchase of seeds, fertilizers, animal produce and selection of cropping pattern.

Sinn et al., (1999) report the role of women in agricultural sector, especially as keepers of small livestock such as sheep and goats, greatly increases worldwide food security by improving the health and livelihood of individual families. They further stated that women are the mainstay of small-scale agriculture, farm labour force and day to day family subsistence. They faced more difficulties than men in giving access to resources such as land and credit and other productivity enhancing inputs and services. The percentage of women who experience poverty is greater than men.

Antoniades and Papayiannis (2000) study the role of women in the family farm of the mountain region of Cyprus and revealed that women in the west zone were aged, with 44 percent being cover over 63 years old. The vast majorities (82.9%) were at the same time housewives and farmers and only 13 percent were fully or partly

employed in off-farm jobs. Younger women had a higher incidence of off-farm jobs mainly due to higher level of education and improved opportunities to choose their own employment status.

Lohani and Khatrichhetri (2001) study women in sustainable agriculture development and environment which reveals that women in the country have primary role in the farming system, providing 55 – 82 percent labour required for overall agricultural production. Women are also the principle users of natural resources and they can play major roles in sustainable agricultural development and environment protection.

Varma (1992) analyzes the activities of women in agriculture with a conclusion that farm related activities are performed almost equally by the womenfolk (as by the menfolk), but unfortunately their contribution in decisions related to farming was found to be very meagre.

It was investigated by Sharma et al., (2010) that decisions related to storage of products and animal fodder were totally dominated by womenfolk in the family.

Sabharwal (2014) marks that menfolk were participated in field preparation, bunds making, puddling and marketing whereas women's participation were highly noticed than male in transplanting, harvesting, winnowing and storage. The additional wage activities undertaken by male were construction work while women were engaged in health workers (dai), embroidery work, grain cleaning, and rug making. The study revealed that women have triple burden as they are engaged in household, agriculture as well as additional wage activities.

Baliyan (2016) summarizes that women share a large burden of agricultural activities, but they are assigned an inferior role. Tasks requiring use of machines, new inputs and market related activities are controlled by men. Women are mostly

involved in lighter manual work not related to marketing activities. On average a women family member spends around 5 – 6 hours per day on animal husbandry, while men spend only 3 and half hours.

CHAPTER – 3

METHODOLOGY

In order to fulfill the objectives of the study, a sound and appropriate methodology is pre-requisite in research. Selection of research topic, area of the study, sample size, tools for data collection, sampling techniques and data analysis process determines the validity of research in fulfilling the objectives of the study. The research design should be well organized, co-operated and suited to supplement the quantitative and qualitative study of the research. The previous chapters focus on introduction to the study and reviewing literature related to the study. This chapter presents the research methodology of the study.

3.1 Area of the Study

As per census reports 2011, the population of Mizoram is 10,91,014 and is the 2nd least populous state in the country. With the three newly created districts, there are now eleven districts in Mizoram. However, at the time of the study there were eight districts and the study were conducted in four districts namely Aizawl (depicted as central zone), Champhai (depicted as east zone), Mamit (depicted as west zone) and Siaha (depicted as south zone).

There are different community groups settled in different geographical locations of Mizoram. The main communities are Mara, Chakma, Reang (also known as Bru or Tuikuk), Paite, Lusei and Hmar. Most of these communities have their settlements concentrated in a particular district. The Maras are mostly settled in Siaha district and it is the dominant community group in the south, Chakmas and Brus are highly concentrated in western and southern part of Mizoram. The Paites settled in the eastern part of Mizoram, mainly in Champhai and Khawzawl districts while Lusei and Hmar communities are mostly concentrated in Aizawl district.

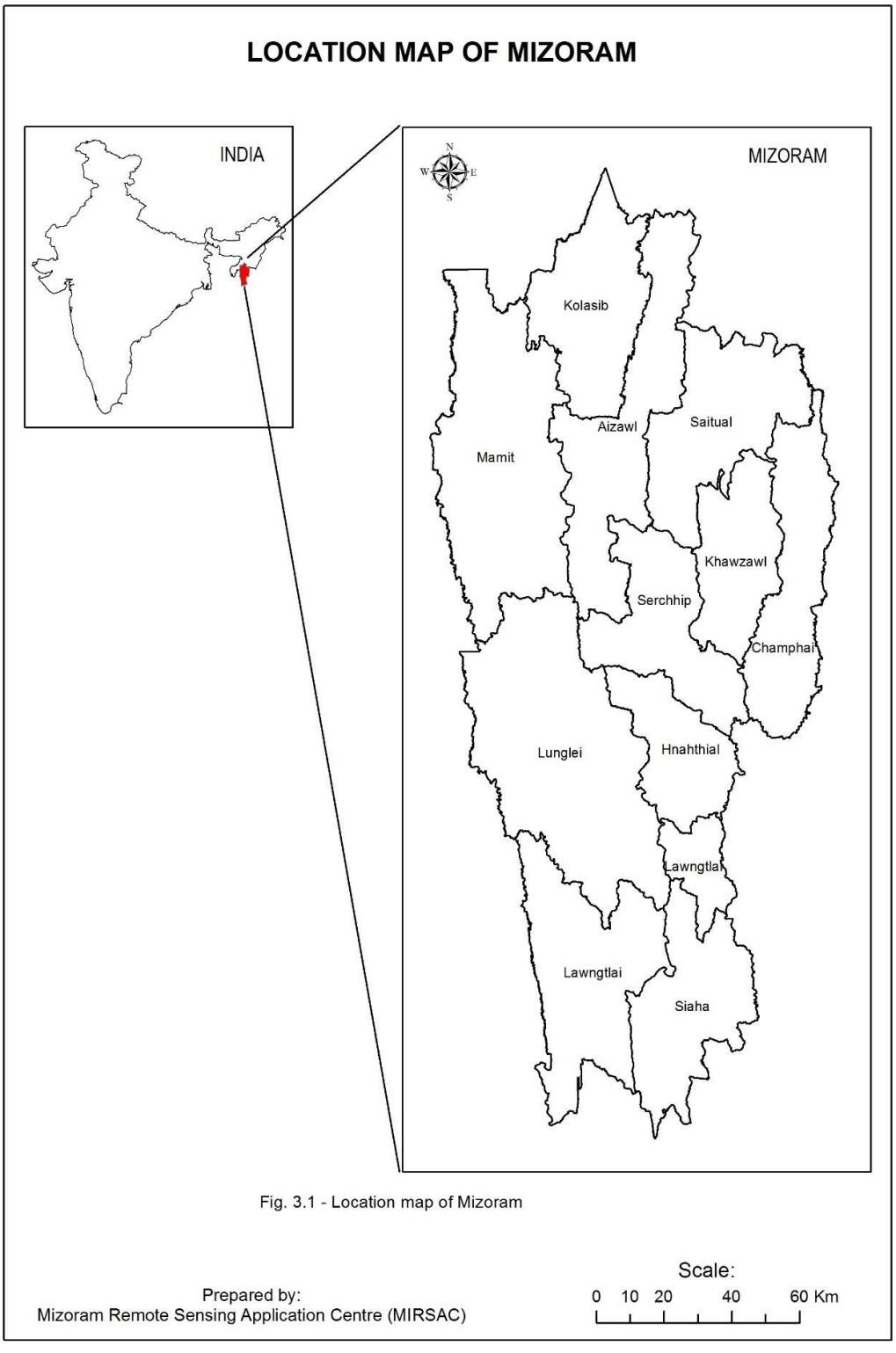


Fig. 3.1 - Location map of Mizoram

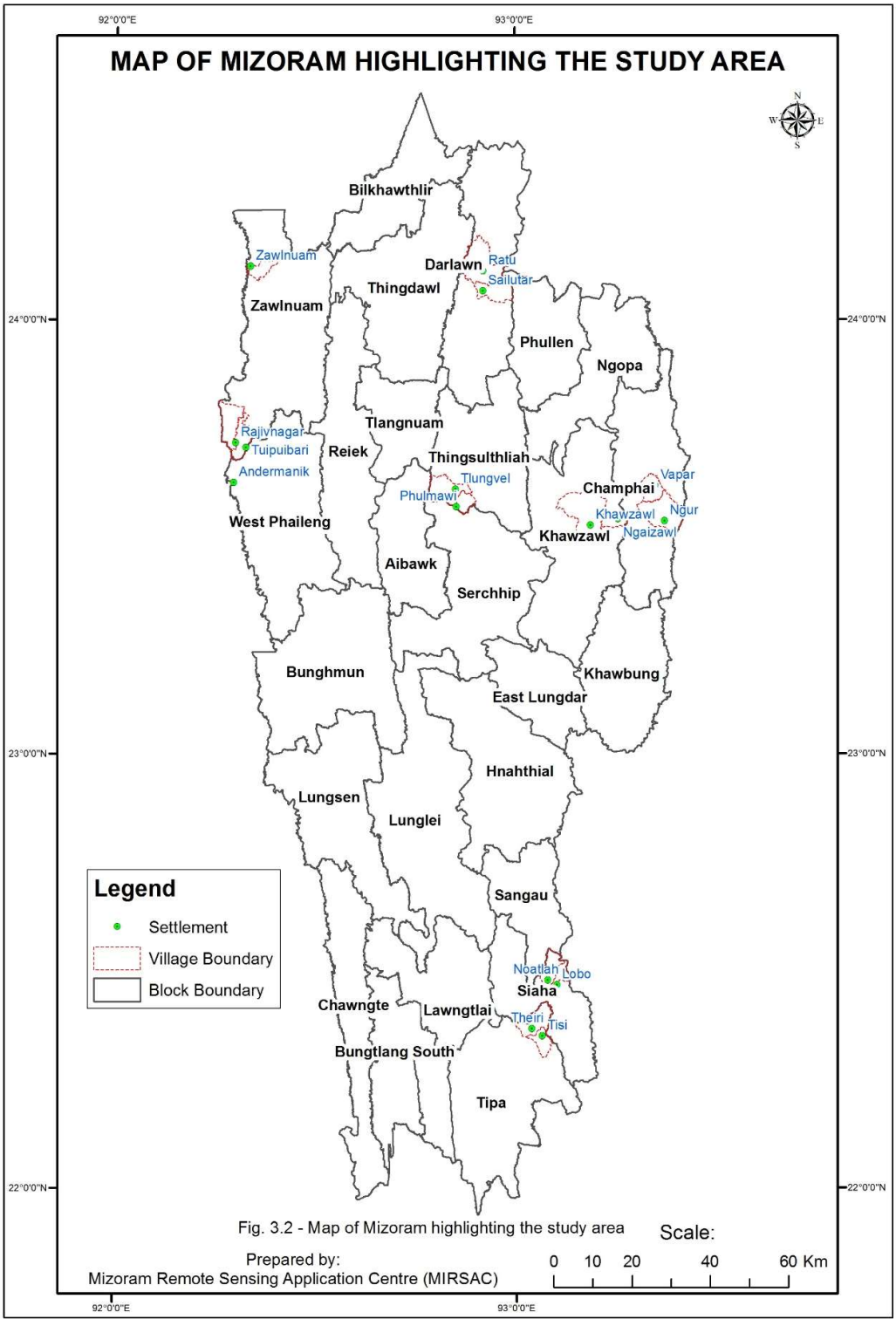


Fig. 3.2 - Map of Mizoram highlighting the study area

Selection of the study area was based on the settlement of these different community groups practicing shifting cultivation. As it was the interest of the study to look into gender roles in livelihood activities under shifting cultivation system among the different communities, the study purposely selected six community groups practicing shifting cultivation in Mizoram.

Mizoram is one of the northeastern states of India with Aizawl as its capital is sharing borders with the Indian states of Tripura, Assam and Manipur. The state also shares a 722 kilometers long international border with the neighboring countries of Bangladesh and Myanmar. Mizoram became the 23rd state of India stepping out from the Union Territory categorization on 20th February, 1987. The area of Mizoram is approximately 21,087 square kilometers and about 91 percent of the state is forested (*https://mizoram.gov.in*).

Mizoram is one of the three states of India with a Christian majority (87%). It is worth mentioning that Mizoram ranked the 2nd highest literacy state in India with 91 percent literates. The people of Mizoram constitute different community groups mainly Mara, Chakma, Bru, Paite, Hmar and Lusei. Agriculture is the mainstay of the people in Mizoram and has traditionally been a subsistence profession. Practicing shifting cultivation has always been their occupation. Reports on Northeast Rural Livelihood Project (NERLP), 2011 mentioned that majority of the population (61.37%) are cultivators practicing shifting cultivation.

Presently there are 11 administrative districts and 26 Rural Development (RD) Blocks. The total number of villages in Mizoram as per Census 2011 is 803. The profiles of selected districts and villages are presented below in terms of population, number of households, literacy rates and number of populations engaged on agriculture.

3.1.1 Siaha District

Located at the remotest south western corner of the state of Mizoram, Siaha District is 278 kms away from the capital city of Aizawl. From times immemorial, the habitation is occupied by the Lakher (commonly called 'Mara') tribes descending from Chin Hills of Myanmar. It is further traced that their origin cannot be clearly defined very far but portrayed in innumerable folk songs tales and tables ascertaining their migration and early settlement in this region. The most common clans of the Lakher includes Bohia, Chhachhai, Chozah, Hlychho,Mathipi, Azyu, Vytuchho, Lava, Nohro, Syuhlo, Syhly, Notlia, Khithie, Khaimeichho etc. The Lakher call themselves "Mara" which is a tribe commonly known as Chins in the Chin Hills of Burma (District Census Handbook: Siaha, 2011).

There are two RD Blocks presently functioning in the district i.e. Siaha RD Block and Tuipang RD Block. The district is predominantly occupied by the Mara and the Mara Autonomous District Headquarters is also located at Siaha. Since, the district is inhabited mostly by the people of Mara, the official dialect is also Mara language. There are 61 villages in the district with a total number of 11,125 households. Population of the district comprised of 56,574 in which male population is 28,594 (50.54%) and female population is 27,980 (49.45%). The density of population of Siaha district is 40 per Sq. Km. In terms of literacy, based on census 2011, the total number of literate recorded is 42,233 (90.01%) which ranked 6th position among the districts of Mizoram. Among the main and marginal workers, number of cultivators in the district is 8908 (45.77%) and number of persons engaged in agricultural labors is 957 (4.92%). (District Census Handbook: Siaha, 2011). The four villages selected for the study in Siaha district are Lobo and Noaltlah – II (under Siaha RD Block), Theiri and Tisi – I (under Tuipang RD Block).

3.1.1.1 Lobo

Lobo is headed towards southeast of Siaha which is 34.4 km from the district capital. The number of households in Lobo village is 167 with a population of 799 in which male population is 396 (49.56 %) while female population is 403 (50.43%). Out of the total population of 799 in a village, it is recorded that a total of 594 (74.34%) are literates while the number of male literates is 312 (52.5%) and number of female literate is 282 (47.4%).

3.1.1.2 Noaltlah – II

Noaltlah – II is 28 km away from the district capital of Siaha town. Noaltlah is grouped into Noaltlah – I, Noaltlah – II and Noaltlah – III. The data for the present study was collected in Noaltlah – II. The total population of the village is 909 in which male population comprised of 466 (51.26%) and female population is 443 (48.73%). A total of 169 households are recorded in the village with 549 (60.39%) literates in which number of literate males and females is 312 (56.83%) and 266 (48.45%) respectively.

3.1.1.3 Tisi – I

Tisi – I is located in southernmost part of Siaha district which is 47.2 kms from the town. There is a total of 196 households with a population of 878 out of which males are 445 (50.68%) and females are 433 (49.31%). The number of literates recorded in the village is 610 (69.47%) out of which 311 (50.98%) are males and 299 (49.01%) are females.

3.1.1.4 Theiri

Theiri is close to Tisi which is 40.8 kms from Siaha. The village has a total of 131 households with a population of 626 where male population comprised of 311 (49.68%) and female comprised of 315 (50.31%). The total number of literates in the

village is 462 (73.80%) out of which females comprised of 243 (52.59%) and males comprised of 219 (47.40%).

3.1.2 Mamit District

Mamit district lies in the western part of Mizoram. The district headquarters Mamit is 112 kms away from the state capital Aizawl. The dominant community groups in the district are Mizos which is followed by Chakma and Reang. The Chakmas in Mizoram are reported to be migrants from Chittagong Hill Tracts of Bangladesh. They are monogamous people and practicing shifting cultivation is always their main source of livelihood. The Reangs are reported to be migrated from Shan State of Myanmar (formerly Burma). Unlike the Chakma community, the Reang are endogamous community.

Mamit district has three RD Blocks viz. Zawlnuam RD Block, West Phaileng RD Block and Reiek RD Block. As per District Census Report (2011) there are 123 villages within the district and the number of households recorded is 17,664 with a total population of 86,364 of which 44,828 (51.90%) are males and 41,536 (48.09%) are females. The density of population in the district is 29 per Sq. Km. Mamit district is the second least literacy rate with 84.93 percent of all the eight districts in the State. A total number of cultivators in the district is 28,669 and agricultural labourers are recorded to be 2,553. Mamit district is popularly known for the abundant production of orange and due to this it is called *"The orange garden of Mizoram."* The selected villages in Mamit district are Zawlnuam, Tuipuibari, Rajiv Nagar and Andermanik which are all under Zawlnuam RD Block.

3.1.2.1 Zawlnuam

Zawlnuam is located 63 kms away from the district capital Mamit. It is the most populous village in Mamit district having 7255 households with a total

population of 35,571 of which male population is 18,454 (51.87%) and female population is 17,117 (48.12%). There are a total number of 22,541 (63.36%) literates with 12645 (46.97%) males and 9896 (43.90%) females.

3.1.2.2 Tuipuibari

Tuipuibari is located at a distance of 57 kms from the district headquarters Mamit. The village holds a population of 1992 with 1080 (54.21%) males and 912 (45.78%) females. The total number of households recoded in the village is 408 with a total number of 1311 (65.81%) literates of which 786 (59.95%) are males and 525 (40.04%) are females.

3.1.2.3 Rajiv Nagar

Rajiv Nagar village is located 104 kms away from district headquarter Mamit. It holds a population of 3530 with 1796 (50.87%) males and 1734 (49.12%) females. The total number of households recorded in the village is 708. There are a total of 1311 (37.13%) literates in the village where 786 (59.95%) are males and 525 (39.44%) are females.

3.1.2.4 Andermanik

Andermanik village is situated 93km away from Mamit. The village has a total of 228 households with a population of 1165 where male population comprised of 612 (52.53%) and female population comprised of 553 (47.46%). The number of literates recorded in the village is 437 (37.51%) of which male comprised of 314 (71.52%) and female comprised of 123 (28.14%).

3.1.3 Champhai District

Champhai district locating in the eastern part of Mizoram shares its border with Myanmar in the eastern terrain of Mizoram and the district came into existence in the year 1998. Champhai which literally means *"flat land"* derives its name from the vast

paddy field at the foothill of Champhai town. During the pre-independent period, the British troops started their settlement and marked the beginning of new era for the district at Champhai in 1897. The dominant tribes of the district are Mizos and the sub-tribes settled are the Paites and Pawis dispersed in several villages of the district.

Champhai, the district headquarters is 194 kms away from the capital city of Aizawl. Champhai district has a total of 90 villages. The number of households recorded is 25,451 with a population of 1,25,745 of which 63,388 (50.40%) are males and 62,357 (49.59%) are females. Density of population in the district is 39 per sq.km. In terms of literacy Champhai district ranked 3rd in the State with 95.91 percent literacy rates. The total number of cultivators recorded in the district is 38,336 with 5,823 agricultural labourers.

Champhai has four RD Blocks namely Champhai RD Block, Khawzawl RD Block, Ngopa RD Block and Khawbung RD Block. The four selected villages for the study included Khawzawl and Ngaizawl villages (under Khawzawl RD Block), Ngur and Vapar villages (under Champhai RD Blocks).

3.1.3.1 Khawzawl

Khawzawl, one of the most populous villages in Champhai district is 40 kms from the district capital Champhai. It has a total number of 4518 households with a total population of 22,413 out of which 11,313 (50.47%) are males and 11,100 (49.52%) are females. The number of literates recorded is 17, 770 (79.28%) of which 9,10,6 (51.24w%) are males and 8,66,4 (48.75%) are females.

3.1.3.2 Ngaizawl

Ngaizawl village is 57 kms far from district headquarter Champhai. There are 144 households in the village with a total population of 797 where 397 (49.81%) are males and 400 (50.18%) are females. The number of literate in the village is recorded

to be 511 (64.11%) out of which 267 (52.25%) are males and 244 (47.74%) are females.

3.1.3.3 Ngur

Ngur village is 20 kms away from Champhai. There are a total of 335 households in the village with a population of 1674 where 826 (49.34%) are males and 848 (50.65%) are females. The total number of literate population in the village is 1257 (75.08%) out of which 607 (48.28%) are males and 650 (51.71%) are females.

3.1.3.4 Vapar

Vapar village, a neighbouring village of Ngur, is 30 kms away from Champhai. The total number of households recorded in the village is 184 with a population of 891 where 481(53.98%) are males and 410 (46.01%) are females. The total number of literates in the village is recorded at 617 (69.24%) out of which 347 (56.23%) are males and 270 (43.76%) females.

3.1.4 Aizawl District

Aizawl, the capital city of Mizoram and the largest city in the state is also the administrative centre of the state. It is connected by road with Silchar through National Highway 54, with Agartala through National Highway 40 and with Imphal through National Highway 150. It is air linked by flights from Kolkata and Guwahati. Being the capital city of the state, Aizawl district stands as the most populated district of the state with a population of 4,00,309. The total number of households recorded in the district is 82,298 with a total of 104 villages. The literacy rate of Aizawl district is highest with 97.89 percent above all the other districts in Mizoram. The density of population in the district is 112 per Sq. km. which is the highest in the State. The district is predominantly occupied by the Mizos, the major community group in Mizoram. Moreover, the tribal sub-clans of Hmar also settle in eastern part.

The Aizawl Municipal Corporation (AMC) was formed in 2010 and is the authority of civic administration of Aizawl city. The urban localities within the city are grouped into wards comprising of 19 wards. There are 83 Local Councils (LC) functioning at the grass root levels of administration which is under the AMC. In the rural areas, Village Councils (VC) are the primary unit of administration at the local level.

There are five RD Blocks in Aizawl district namely Tlangnuam RD Block, Darlawn RD Block, Phullen RD Block, Aibawk RD Block and Thingsulthliah RD Block. As per Census Reports (2011), the number of cultivators in the district is 39,266 while agricultural labourers comprise of 11,434. The villages selected for the study in Aizawl disctrict are Sailutar and Ratu (under Darlawn RD Block), Tlungvel and Phulmawi (under Thinsulthliah RD Block).

3.1.4.1 Sailutar

Sailutar village lies in the eastern part of Aizawl district. The village is located at a distance of 139 kms from the capital city of Aizawl. The number of households settled in the village is 97 with a total population of 536 where 265 (49.44%) are males and 271 (50.55%) are females. The total number of literates in the village is 418 (77.98%) out of which 206 (49.28%) are males and 212 (50.71%) are females.

3.1.4.2 Ratu

Located in the eastern part of the district, Ratu is 143 kms from the district capital Aizawl. The total number of households in the village is 435. The population of the village is 2176 of which 1129 (51.88%) are males and 1047 (48.11%) are females. The number of literate persons in the village is 1710 (78.58%) out of which 905 (52.92%) are males and 805 (47.07%) are female.

3.1.4.3 Tlungvel

Among the sample villages, Tlungvel is one of the nearest villages from the district capital Aizawl with a distance of 59 kms. Tlungvel village has a total of 559 households with a population of 2529 of which 1238 (48.95%) are males and 1291(51.04%) are females. The number of literate persons in the village is 2128 (84.14%) where 1033 (48.54%) are males and 1095 (51.45%) are females.

3.1.4.4 Phulmawi

Phulmawi vilage, situated in the eastern part, is 64 kms away from Aizawl. There are a total of 66 households with a population of 277 where 146 (52.70%) are males and 131 (47.29%) are females. The number of literates in the village is 229 (82.67%) with 122 (53.27%) males and 107 (46.72%) females.

3.2 Sample of the Study

The study used purposive sampling method wherein the selection of sample for the study was mainly based on those households practicing shifting cultivation. As it was also of interest of the study to see the differences in livelihood activities among different communities under shifting cultivation, the samples were identified on the basis of different community groups settled in different geographical locations in the State.

A total of five households each were selected from the sample villages to make a total of 80 households altogether. From each sample households, two respondents (one male and one female) were interviewed which made a total of 160 respondents (80 males and 80 females). Sampling procedure followed in the study is presented in Table 3.1.

Table 3.1: Distribution of sample size

District	No. of RD Block	No. of village	No. of Household	No. of Respondents		
				Male	Female	Total
Siaha	2	4	20	20	20	40
Mamit	1	4	20	20	20	40
Champhai	2	4	20	20	20	40
Aizawl	2	4	20	20	20	40
Total	**7**	**16**	**80**	**80**	**80**	**160**

3.3 Tools for Data Collection

The required data for the study were collected from primary and secondary sources. Primary sources of information were collected using Interview Schedule formulated for the purpose of the study. The structure of the Interview Schedule was drafted in accordance with the objectives of the study which is basically grouped into socio-economic profile of the respondents, land holding and practices, shifting cultivation activities, post-harvest and marketing, gender roles in shifting cultivation and livelihood activities.

The Interview Schedule was pre-tested to a group of farmers who were not included in the samples of the study. Based on the results of the pre-test, necessary revision or improvement of the interview schedule was made before the actual collection of field data. Secondary data relevant to the study were also collected from various sources such as Census Reports and Statistical Abstracts, internet, books and journals.

3.4 Data Collection

The primary data were collected by the researcher in all the sample villages. The researcher had to engage interpreters in sample villages under Mamit district as there was communication problem in interviewing the respondents. The male and

female respondents were interviewed separately with the help of Interview Schedules prepared for them. The field data were collected during October 2016 to April 2017.

3.5 Data Analysis

In order to achieve accurate results on quantitative data, appropriate statistical tool is vital for data processing and analysis. The data obtained from the field were encoded and analyzed using the following statistical tools:

Quantifiable data were processed and analyzed using Statistical Package for Social Sciences (SPSS). Descriptive statistics such as frequency counts, percentage, mean, standard deviation and range were used for the descriptive portion of the data.

T-test was applied to examine the differences between male and female respondents in their average performance on livelihood activities under shifting cultivation system.

Chapter – 4

SOCIO-ECONOMIC PROFILE

The socio-economic profile of the respondents is described in terms of gender, age, educational qualification, family size, household status, income, expenditure and years of experience in practicing shifting cultivation. The socio-economic profile of respondent households was collected from both male and female whoever was convenient at the time of data collection.

4.1 Gender

The data on gender distribution of the respondents is presented in Table 4.1. Out of the total sample interviewed, 51 (63.75%) respondents were males while 29 (36.25%) were females.

Table 4.1: Gender-wise distribution of the respondents

Sl. no	Number				Percent		
	Zone	Male	Female	Total	Male	Female	Total
1	South	19	1	**20**	23.75	1.25	**25**
2	West	12	8	**20**	15	10	**25**
3	East	11	9	**20**	13.75	11.25	**25**
4	Central	9	11	**20**	11.25	13.75	**25**
	Total	**51**	**29**	**80**	**63.75**	**36.25**	**100**

Source: *Field survey, 2016-17*

The zone-wise distribution of data further reveals that the composition of male respondents was higher in all the three zones viz. south, west and east except the central zone where the composition of female respondents was higher over males (Table 4.1).

4.2 Age

The age of the respondents are presented in Table 4.2. As may be seen in the Table, the age of respondents on average was 47 years ranging from a minimum of 23 to a maximum of 79 years with a standard deviation of 12.42. The age of

respondents in south zone was highest with an average of 51.90 years followed by respondents in west zone with an average of 49.90 years while the respondents in east zone were youngest with an average of 46.55 years. The data on age of respondents is an indication that the respondents in general are still in their productive age while a lesser number of little older respondents over 60 years and above also still had to engage in shifting cultivation activities with no other options for livelihoods.

Table 4.2: Age of the respondents

Sl. no.	Zone	Age			
		Minimum	Maximum	Mean	Std. Dev
1	South	30	79	51.90	11.47
2	West	28	70	49.90	12.74
3	East	23	76	46.55	13.08
4	Central	28	67	46.65	11.53
Overall		**23**	**79**	**47**	**12.42**

Source: *Field survey, 2016-17*

The respondents are further grouped into different age categories and the results are presented in Table 4.3. As shown in the Table, the highest number of respondents (30%) belonged to the age group of '40 – 50 years' followed by respondents belonging to the age group of '30 – 40 years' with 25 percent while least number of respondents (5%) belonged to the age groups of 'below 30 years' and '70 years and above.'

Among the respondents in south zone, the highest number (40%) belonged to the category of '40 – 50 years' followed by the age group of '50 – 60 years' with 30 percent while the least number (5%) belonged to the category of '30 – 40 years' (Table 4.3).

Half (50%) of the respondents in west zone belonged to the category of '30 – 40 years' followed by the age group of '40 – 50 years' with 20 percent. There was

equal number of respondents with 10 percent each belonging to the age groups of '50 – 60 years' and '60 – 70 years.' There was also equal number of respondents with 5 percent each belonging to the age groups 'below 30 years' and '70 years & above' (Table 4.3).

Table: 4.3: Categorisation of respondents according to age groups

Sl. no	Age	Zone				Total
		South	West	East	Central	
		Number				
1	Below 30	0	1	2	1	**4**
2	30-40	1	10	4	5	**20**
3	40-50	8	4	7	5	**24**
4	50-60	6	2	4	6	**18**
5	60-70	3	2	2	3	**10**
6	70 & above	2	1	1	0	**4**
	Total	**20**	**20**	**20**	**20**	**80**
		Percent				
1	Below 30	0	5	10	5	**5**
2	30-40	5	50	20	25	**25**
3	40-50	40	20	35	25	**30**
4	50-60	30	10	20	30	**22.50**
5	60-70	15	10	10	15	**12.50**
6	70 & above	10	5	5	0	**5**
	Total	**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

A little over one-third (35%) of the respondents in east zone belonged to the age group of '40 – 50 years' followed by the age group of '30 – 40 years' and '50 – 60 years' with 20 percent each while the least number (5%) belonged to '70 years & above' (Table 4.3).

The highest number of respondents (30%) in central zone belonged to the age group of '50 – 60 years' followed by the age groups of '30 – 40 years' and '40 – 50 years' with 25 percent each while least number with 5 percent belonged to the age group of 'below 30 years' (Table 4.3).

4.3 Educational qualification

According to the 15th official census in India (2011) literacy rate in India was found to be 74.04 percent. Kerala has the highest literacy rate which is 94 percent while Mizoram has the 2nd highest literacy rate with 91 percent comprising of 84.31 percent in rural and 98.10 percent in urban areas. Despite high literacy rate in the state, educational qualification of the respondents was quite low as majorities of the respondents were found to drop-out their schooling before completion of higher education. Shahapur et al. (2017) earlier mentioned that Drop-out-rate of the secondary level is extremely high in villages in India which also happened in the selected areas of the study. Gouda et.al (2014) also highlighted the percentage of drop-out rates in India where the stages of drop-out rates are highest in middle school with 18 percent followed by high school drop-outs with 16 percent and primary school drop-outs with 9 percent in India. The gender differentials were still persisting in school education. The dropout was higher among girls (15 percent) than boys (11 percent). With regard to rural- urban differences, more girls dropped out in rural areas (17 percent) than in urban areas. Sreekanthachari et al. (2013) identified problems of rural education in India which includes lack of infrastructure and transportation facilities, less number of school present in rural areas, lack of basic amenities and deficiency of funds. However, the prevailing problems of rural education in Mizoram are also relatable to early marriage among adolescents, financial insufficiency, demand of manpower and workforce by the family and lack of interest in schooling mostly in rural areas.

As per Mizoram Board of School Education, the level of education in the State is categorised into 1) Primary School (Kindergarten – IV Standard); 2) Middle

School (V – VIII Standard); 3) High School (IX – X Standard) and 4) Higher Secondary School (XI – XII Standard).

The educational qualification of the respondents as presented in Table 4.4 reveals that the highest percentage of the respondents (33.75%) completed Middle School followed by those respondents who completed High School (28.75%) and Primary School (18.75%). There were few, but negligible number of respondents completed Higher Secondary and Graduation with 1.25 percent each. There were few illiterate respondents which accounts for 16.25 percent.

Table 4.4: Educational qualification

Sl. no	Education	Zone				Total
		South	West	East	Central	
		Number				
1	Primary	0	4	5	6	**15**
2	Middle	8	5	8	6	**27**
3	High School	8	4	4	7	**23**
4	Higher Secondary	0	0	1	0	**1**
5	Graduate	1	0	0	0	**1**
6	Illiterate	3	7	2	1	**13**
	Total	**20**	**20**	**20**	**20**	**80**
		Percent				
1	Primary	0	20	25	30	**18.75**
2	Middle	40	25	40	30	**33.75**
3	High School	40	20	20	35	**28.75**
4	Higher Secondary	0	0	5	0	**1.25**
5	Graduate	5	0	0	0	**1.25**
6	Illiterate	15	35	10	5	**16.25**
	Total	**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

The highest number of respondents in south zone completed Middle and High School with 40 percent each and the number is followed by illiterate with 15 percent while only 5 percent of them completed Graduation (Table 4.4).

Among the respondents in west zone, the highest number (35%) of respondents was illiterate. The number is followed by those respondents who

completed Middle School with 25 percent. There were 20 percent each of the respondents who completed Primary School and High School (Table 4.4).

Of the respondents in east zone, the highest number (40%) completed Middle School followed by respondents who completed Primary School with 25 percent, High School with 20 percent and High Secondary School with 5 percent. There were a total of 10 percent illiterates among the respondents in east zone (Table 4.4).

A little over one-third (35%) of the respondent in central zone completed High School followed by the respondents who completed Primary and Middle School with 20 percent each while there were few respondents (5%) who were still illiterate (Table 4.4).

Observation can be made from the data on education qualification of the respondents that there is still a need for more of adult literacy campaigns particularly in areas such as west zone where the number of illiterates are still comparatively high. All of the 5 percent of the respondents who completed Graduation belonged to south zone while the total of 5 percent respondents who completed Secondary Higher School belonged to east zone.

4.4 Family size

The Mizos follow the patriarchal form of society. The people who live together under one roof and eat from the same hearth belong to one family. The average size of a family is between six and seven people. The nuclear family is the common type. Usually the family comprises of father and mother and their children. At times, relative(s) also live with the family.

The average family size of the respondents was 6.01 ranging from a minimum of 3 to a maximum of 13 members with a standard deviation of 2.0. While no much variation in family size was observed across the different zones, south and

central zones had little more family members with an average of 6.3 members followed by east with an average of 6 members and west with an average of 5.45 members (Table 4.5).

Table 4.5: Family size of the respondents

Sl. no.	Zone	Family size			
		Minimum	Maximum	Mean	Std. Dev
1	South	3	12	6.30	1.89
2	West	3	10	5.45	1.70
3	East	3	12	6	2.18
4	Central	3	13	6.30	2.27
Overall		**3**	**13**	**6.01**	**2.02**

Source: *Field survey, 2016-17*

The respondents are further distributed according to different categories of family size and the results are presented in Table 4.6. Majority (73.75%) of the respondents had family size of '5 – 10' while households having 'below 5' account for 21.25 percent and households having '10 or more' account for only five percent.

Table 4.6: Categorization of respondents according to family size

Sl. no	Family size	Zone				Total
		South	West	East	Central	
		Number				
1	Below 5	2	6	6	3	**17**
2	5 to 10	17	13	13	16	**59**
3	10 & above	1	1	1	1	**4**
	Total	**20**	**20**	**20**	**20**	**80**
		Percent				
1	Below 5	10	30	30	15	**21.25**
2	5 to 10	85	65	65	80	**73.75**
3	10 & above	5	5	5	5	**5**
	Total	**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

The zone-wise data also shows similar trend where majority of respondents in all the zones belonged to the category of '5 to 10.' The west and east zones had a little more respondents (30%) having family size of 'below 5' while the number of

respondents which fall under the same category of family size in central and south zones account for 15 percent and 10 percent respectively. Among the respondents whose family size fall within the category of '5 – 10', the south zone had highest number with 85 percent followed by central zone with 80 percent while west and east zones had 65 percent each.

4.5 Family status

According to 2011 census, Mizoram has a population of 1,097,206 with 222,079 households in rural and urban areas. BPL (Below Poverty Line) Baseline Survey 2016, Mizoram stated that 56,584 families in Mizoram are still living Below Poverty Line (https://www.telegraphindia.com/). Lawngtlai District in the southernmost part of the state has the highest number of BPL families at 13,162 out of total households of 20,163 whereas Mamit District in the western corner of the state has the highest percentage of BPL families at 35.64 and Champhai district has the lowest percentage at 9.35.

Attempt was also made to understand the economic status of respondent households in terms of the ration cards held by them viz. yellow (Antyodaya Anna Yojana), blue (Priority Household) and white (Above Poverty Line). The yellow holders also known as 'Antyodaya Anna Yojana (AAY) households' are those households identified as "poorest of the poor" selected from the Below Poverty Line (BPL) category. The blue card holders also known as 'Priority Household (PHH)' are those household belonging to BPL category and the white card holders are households belonging to Above Poverty Line (APL) category.

The results as shown in Table 4.7, majority (65%) of the respondents belonged to Priority Household (PHH) category followed by households belonging

to Above Poverty Line (APL) category with 21.25 percent while the rest 13.75 percent belonged to Antyodaya Anna Yojana (AAY) category.

Table 4.7: Family status

Sl. no.	Zone	Number				Percent			
		AAY	PHH	APL	Total	AAY	PHH	APL	Total
1	South	2	12	6	**20**	10	60	30	100
2	West	0	14	6	**20**	0	70	30	100
3	East	3	14	3	**20**	15	70	15	100
4	Central	6	12	2	**20**	30	60	10	100
Total		**11**	**52**	**17**	**80**	**13.75**	**65**	**21.25**	**100**

Source: *Field survey, 2016-17*

The data on zone-wise distribution of respondents further reveal that west and east zones had more of PHH which account for 70 percent while the PHH in south and central zones account for 60 percent. Among the households belonging to AAY, the central zone has highest number with 30 percent followed by east with 15 percent while the south zone had least number with 10 percent. There were more households belonging to APL in south and west zones with 30 percent each while the APL families in east and central zones account for 15 percent and 10 percent respectively (Table 4.7).

4.6 Household income

For the information on household income, the respondents were asked to enumerate the total income earned by their families during the last one year based on their simple recalls. Thus the household income was worked out in terms of annual income which includes the income earned by the respondent households from both agriculture and non-agriculture sources during the past one year.

The results presented in Table 4.8 reveal that the annual household income of the respondents on average was Rs. 65,943.80 (an average monthly income of about Rs. 5,495) ranging from a minimum of Rs. 2,000/- to a maximum of Rs. 5,82,000/-

with a standard deviation of 82661. The results show a wide range of income variation among the respondents. Based on the results of family size and household income, it can be assumed that the respondents had to manage the household requirements of about 6 members with an average monthly income of Rs. 5,495/-.

Table 4.8: Annual household income

(in Rupees)

Sl. no.	Zone	Annual income			
		Minimum	Maximum	Mean	Std. Dev
1	South	2000	582000	76940	1.23
2	West	5000	90000	33200	23964.80
3	East	3000	346000	76225	1.01
4	Central	28000	142000	77410	29605.01
Overall		**2000**	**582000**	**65943.80**	**82661**

Source: *Field survey, 2016-17*

The data on annual income across different zones further reveal that the respondents in central zones had highest income with an average of Rs. 77,410/- followed by south zone with an average income of Rs. 76,940/- while west zone had the least with an average income of Rs. 33,200/- (Table 4.8).

The respondents are further distributed according to different categories of income and the data are presented in Table 4.9. Large majority (87.50%) of the respondents belonged to households earning 'below Rs. 10,000' annually followed by households earning 'Rs. 10,000 – Rs. 20,000' a year with 8.75 percent. The data further reveals a decrease in number of households as the income categories increases with only 1.25 percent in the highest income category of 'Rs. 50,000 and above.'

While most of the respondents belonged to households having income categories of 'below Rs. 10,000' and 'Rs. 10,000 – Rs. 20,000,' all of the 2.50 percent of respondents having annual income of 'Rs. 30,000 – Rs. 40,000' belonged

to east zone and all of the 1.25 percent of respondents having annual income of Rs. 50,000 and above' belonged to south zone (Table 4.9).

Table 4.9: Categorization of respondents according to annual household income

(in Rupees)

Sl. no	Income	Zone				Total
		South	West	East	Central	
		Number				
1	Below 10000	17	20	15	18	**70**
2	10000-20000	2	0	3	2	**7**
3	30000-40000	0	0	2	0	**2**
4	50000 and Above	1	0	0	0	**1**
Total		**20**	**20**	**20**	**20**	**80**
		Percent				
1	Below 10000	21.25	25	18.75	22.50	**87.5**
2	10000-20000	2.50	0	3.75	2.50	**8.75**
3	30000-40000	0	0	2.50	0	**2.50**
4	50000 and Above	1.25	0	0	0	**1.25**
Total		**25**	**25**	**25**	**25**	**100**

Source: *Field survey, 2016-17*

4.7 Agriculture income

The data on annual income of respondents on agriculture was collected and the results are presented in Table 4.10. The annual income of the respondents on agriculture on average was Rs. 31,400/- ranging from a minimum of Rs. 2,000 – Rs. 1,20,000/- with a standard deviation of 29791.62. The data indicate wide variation among the respondents in terms of their income on agriculture.

Table 4.10: Annual income on agriculture

(Amount in Rupees)

Sl. no.	Zone	Agriculture Income			
		Minimum	Maximum	Mean	Std. Dev
1	South	3000	80000	29125	21305.96
2	West	5000	60000	15450	13200.78
3	East	2000	100000	19525	23705.14
4	Central	5000	120000	61500	33537.88
Overall		**2000**	**120000**	**31400**	**29791.62**

Source: *Field Survey, 2016 - 17*

Based on the data, the respondents' annual income on agriculture is calculated to be about 48 percent of the total household income. It may be noted that variations could be observed among the respondents on income from agricultural sources as their produce from jhum could barely meet the requirements for household consumption. Only few households could sell out their jhum crops to supplement their household income.

Table 4.11 further presents the data on distribution of respondents according to income category on agriculture. Observation can be made from the Table that the annual income from agriculture sources of the highest number of respondents (25%) was 'below Rs. 10,000' and at the same time the annual income of the same number from agriculture was 'Rs. 50,000 and above.' The number is followed by those respondents whose agriculture income fell within the category of 'Rs. 10,000 – Rs. 20,000' with 18.75 percent and Rs. 20,000 – Rs. 30,000' with 15 percent.

Table 4.11: Categorisation of respondents according to annual household income on agriculture

(in Rupees)

Sl. no	Income	Zone				Total
		South	West	East	Central	
		Number				
1	Below 10000	3	7	9	1	**20**
2	10000-20000	3	7	3	2	**15**
3	20000-30000	4	4	2	2	**12**
4	30000-40000	4	1	3	1	**9**
5	40000-50000	3	0	1	0	**4**
6	50000 and Above	3	1	2	14	**20**
	Total	**20**	**20**	**20**	**20**	**80**
		Percent				
1	Below 10000	3.75	8.75	11.30	1.25	**25**
2	10000-20000	3.75	8.75	3.75	3	**18.75**
3	20000-30000	5	5	2.50	3	**15**
4	30000-40000	5	1.25	3.75	1.25	**11.25**
5	40000-50000	3.75	0	1.25	0	**5**
6	50000 and Above	3.75	1.25	2.50	17.50	**25**
	Total	**25**	**25**	**25**	**25**	**100**

Source: *Field survey, 2016-17*

The respondents whose agriculture income fall within the category of 'Rs. 30,000 – Rs. 40,000' account for 11.25 percent while the respondents having agriculture income of 'Rs. 40,000 – Rs. 50,000' account only for 5 percent.

4.8 Household expenditure

Household expenditure is calculated on the basis of monthly expenditure incurred by the households on purposes like electricity and water bills, education fees, house rent and consumable items etc. The information on monthly household expenditure was also based on the simple recall of respondents. The data in Table 4.12 show that the monthly expenditure of respondent households on average was Rs. 6,306.25 ranging from a minimum of Rs. 1000/- to a maximum of Rs. 35,000/- with a standard deviation of 3800.60.

Table 4.12: Monthly household expenditure

(in Rupees)

Sl. no.	Zone	Household monthly expenditure			
		Minimum	Maximum	Mean	Std. Dev
1	South	1000	35000	9175	8100.15
2	West	1000	6000	3700	1567.77
3	East	1000	12000	6125	2901.33
4	Central	2500	12000	6225	2633.16
Overall		**1000**	**35000**	**6306.25**	**3800.60**

Source: *Field survey, 2016-17*

The data on distribution of respondents according to different categories on household expenditures are presented in Table 4.13. As may be seen from the Table, the monthly household expenditure of large majority (85%) was 'below Rs. 5,000' followed by respondents whose monthly household expenditure fell within the category of 'Rs. 5,000 – Rs. 10,000' with 11.25 percent. The data further shows a decrease in number of respondents as the category of household expenditure go

higher. Respondents whose monthly expenditure fell within the category of 'Rs. 15,000 and above' account for only 1.25 percent.

Table 4.13: Categorisation of respondents according to monthly household expenditure

(in Rupees)

Sl. no	Expenditure	Zone				Total
		South	West	East	Central	
		Number				
1	Below 5000	13	20	17	18	**68**
2	5000-10000	4	0	3	2	**9**
3	10000-15000	2	0	0	0	**2**
4	15000 and above	1	0	0	0	**1**
	Total	**20**	**20**	**20**	**20**	**80**
		Percent				
1	Below 5000	65	100	85	90	**85**
2	5000-10000	20	0	15	10	**11.25**
3	10000-15000	10	0	0	0	**2.50**
4	15000 and above	5	0	0	0	**1.25**
	Total	**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

4.9 Expenditure on food

The respondents were also asked to estimate their monthly household expenditure on food items based on their simple calculation. The results as presented in Table 4.14, the monthly expenditure of respondents on food items on average was Rs. 3,271.25 ranging from a minimum of Rs. 500/- to Rs. 10,000/- with a standard deviation of 2086.92.

Table 4.14: Expenditure on food

(Amount in Rupees)

Sl. no.	Zone	Expenditure on Food Items			
		Minimum	Maximum	Mean	Std. Dev.
1	South	500	10000	3950	3068.94
	West	500	4000	2430	1221.77
3	East	600	8000	3395	2039.47
4	Central	1500	6000	3310	1338.06
Overall		**500**	**10000**	**3271.25**	**2086.92**

Source: *Field Survey, 2016 - 17*

The respondents in south zone had the highest expenditure on food with an average of Rs. 3,950/- per month followed by east zone with an average of Rs. 3,395/- per month while respondents in west zone had the least with an average of Rs.2,430/- per month.

The percentage of expenditure on food was further calculated on the basis of available data and the results are presented in Table 4.15. As highlighted in Table 4.15, half (50%) of the respondents estimated that they incurred about 40-60 percent of their total expenditure solely on food items while over one-third (37.50%) of the respondents estimated to incur about 60-80 percent and 6.25 percent estimated to incur as high as 80 percent or more on food.

Table 4.15: Percentage of household expenditure on food

(in Rupees)

Sl. no	Expenditure	Zone				Total
		South	West	East	Central	
	Number					
1	Below 20 percent	2	0	0	0	**2**
2	20-40 percent	2	1	0	0	**3**
3	40-60 percent	9	4	14	13	**40**
4	60-80 percent	7	11	5	7	**30**
5	80 percent and above	0	4	1	0	**5**
	Total	**20**	**20**	**20**	**20**	**80**
	Percent					
1	Below 20 percent	10	0	0	0	**2.50**
2	20-40 percent	10	5	0	0	**3.75**
3	40-60 percent	45	20	70	65	**50**
4	60-80 percent	35	55	25	35	**37.50**
5	80 percent and above	0	20	5	0	**6.25**
	Total	**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

Referring the data on household income and expenditure, observation can be made that the respondent households had to spend more than what they earned whereby the average monthly expenditure reported was Rs. 6,306/- against the

average monthly income of Rs. 5,495/-. The data may be understood in such a way that it is not uncommon particularly for the rural people to manage their livelihoods beyond the limit of their income. It is also clear from the data that the respondent households had to make their own arrangements to meet their household requirements even beyond the limit of their household income.

4.10 Years of experience in shifting cultivation

The practiced of shifting cultivation is a way of life and dependent to the rural lifestyle. Hence, rural households experienced shifting cultivation initially from the time of their settlement as a family. Shifting cultivation is periodic, traditional and labour intensive in which the involvement of every family member is required in the sequence of shifting cultivation.

The respondents were also asked about the length of experience they had in shifting cultivation. The results presented in Table 4.16 reveal that the respondents on average had 21.57 years of experience in shifting cultivation with ranging from a minimum of 5 years to a maximum of 50 years with a standard deviation of 13.31. The respondents in east zone had longest experience with 24.20 years followed by central zone with 4 years while south zone had the least experience with 18.95 years.

Table 4.16: Years of experience in shifting cultivation

Sl. no.	Zone	Years of Experience			
		Minimum	Maximum	Mean	Std. Dev.
1	South	5	50	18.95	13.53
2	West	5	40	19.15	12.41
3	East	7	50	24.20	11.32
4	Central	5	50	24	15.97
Overall		**5**	**50**	**21.57**	**13.31**

Source: *Field Survey, 2016 - 17*

The data presented in Table 4.17 further reveal that the highest number with a little over one-fourth (27.50%) of the respondent reported to have '30 – 40 years'

of experience followed by those respondents with 'below 10 years' of experience with 23.75 percent. There were also respondents but with lesser number (3.75%) who had been practicing shifting cultivation for '50 or more years.'

Table 4.17: Categorization of respondents according to years of experience in shifting cultivation

Sl. no	Years	Zone				Total
		South	West	East	Central	
		Number				
1	Below 10	8	5	2	4	**19**
2	10 to 20	1	4	2	7	**14**
3	20 to 30	4	4	7	0	**15**
4	30 to 40	6	5	7	4	**22**
5	40 to 50	0	2	1	4	**7**
6	50 and above	1	0	1	1	**3**
	Total	**20**	**20**	**20**	**20**	**80**
		Percent				
1	Below 10	40	25	10	20	**23.75**
2	10 to 20	5	20	10	35	**17.50**
3	20 to 30	20	20	35	0	**18.75**
4	30 to 40	30	25	35	20	**27.50**
5	40 to 50	0	10	5	20	**8.75**
6	50 and above	5	0	5	5	**3.75**
	Total	**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

Chapter summary

The present chapter deals with the socio-economic profile of the respondents. The informants of the households were 63.75 percent male and 36.25 percent female. The mean age of the respondents was 48.75 years and the highest percentage of the respondents (30 %) were between the age group of 40-50 years. The highest percentage of the respondents (33.75 %) attained middle school level of education. The average numbers of family members consist of 6.01 and 73.75 percent of the respondent's households comprised of 5-10 members in a family. The highest percentage (65%) of the respondents' family were categorized as Priority Households (PHH).

The average annual income of the household was Rs 65943.75/- with minimum income of Rs 2000/- and maximum of income of Rs 582000/-. The result shows that 25 percent of the respondent annual income was lesser than Rs 10000. Similarly, the same percentages (25%) of the household's annual income was more than Rs 50000. The average annual income on agriculture sources was Rs 31400/- with minimum of Rs 5000/- and maximum of Rs 120000/-. Moreover, the households (25%) annual income from agriculture sources were more than Rs 50000. Similarly, households with 25 percent of the respondent's annual income on agriculture was lesser than Rs 10000/-.

The average household monthly expenditure was Rs 6306.25 with maximum expenditure of Rs 35000/- and minimum expenditure of Rs 1000/-. It was observed that majorities (85%) of the respondents' household monthly expenditure was lesser than Rs 5000. The highest percentage (37.5%) of the household's monthly expenditure on food/consumable item was 60-80 percent out of the total expenditure.

The highest percentage (27.5%) of the respondents experienced shifting cultivation for a period of 30-40 years.

CHAPTER – 5

LIVELIHOOD ACTIVITIES UNDER SHIFTING CULTIVATION

This chapter discusses the livelihood activities under shifting cultivation system. The discussion comprises of three components viz. landholding and practices; shifting cultivation activities; and other livelihood activities.

5.1 Landholding and Practices

The landholding in shifting cultivation is group into permanent land and jhum land. The area or size of land was given by the respondents in terms *'tin'* which is the local term used to measure the size land that may be taken as equivalent to an acre.

For the purpose of discussion of the information on landholding and practices, land is classified into permanent land and jhum land. Permanent land in the rural setting of Mizoram is a land having a certificate or pass issued by competent authority i.e. Village Councils (VC). The rural households can have ownership of lands directly through VC pass, by inheritance or by purchasing. On the other hand, jhum land is a community land which the VCs allot to the rural households every year for the jhum cultivation.

Among the rural households, there are some who cultivate either their own permanent or jhum lands while there are some who cultivate both permanent and jhum lands. As may be seen in Table 5.1, large number (46.25%) of respondents managed both permanent and jhum lands. There were about one-third (32.50%) households who managed shifting cultivation in their permanent land while 21.25 percent households managed shifting cultivation in the jhum plot allotted by the VCs.

Table 5.1: Land holding pattern

Zone	Number				Percent			
	PL	JL	Both	Total	PL	JL	Both	Total
South	6	2	12	20	30	10	60	100
West	14	5	1	20	70	25	5	100
East	6	5	9	20	30	25	45	100
Central	-	5	15	20	-	25	75	100
Total	**26**	**17**	**37**	**80**	**32.50**	**21.25**	**46.25**	**100**

Source: *Field survey, 2016-17*

5.1.1 Permanent Land

Permanent lands are usually utilized for cash crops and horticulture crops to supplement the family income. In certain villages, shifting cultivation is also practiced in permanent lands where allotment of jhum land is not annually held for certain reasons such as unavailability of village reserve area, family's willingness to pursue cultivation in their permanent land and due to shortening of fallow period.

The average size of permanent lands owned by the respondent households as presented in table 5.2 was 4.88 acre ranging from a minimum of 1 acre to a maximum of 20 acre with a standard deviation of 4.44. The results show wide variation in the size of permanent lands owned by the respondents.

Table 5.2: Area of permanent land owned

(in Acre)

Sl. no	Zone	Permanent Land			
		Minimum	Maximum	Mean	Std. Dev.
1	South	1	15	5.75	4.03
2	West	1.50	20	4.57	5.27
3	East	1	20	5.97	5.54
4	Central	1	10	3.25	2.95
Overall		**1**	**20**	**4.88**	**4.44**

Source*: Field survey, 2016-17*

The data in Table 5.3 further reveal that majority (59.15%) of the respondent households belonged to the category of those who have 'below 3 acres' followed by

those who have '3 – 6 acre' with 33.80 percent while the rest (7.04%) belonged to the category of those who have '9 – 12 acre.'

Table 5.3: Distribution of respondents according to area of permanent land owned

Sl. no	Zone	Number				Percent			
		Below 3 acre	3 - 6 acre	6 - 9 acre	Total	Below 3 acre	3 - 6 acre	6 - 9 acre	Total
1	South	6	8	1	15	40	53.33	6.67	**100**
2	West	13	3	1	17	76.47	17.65	5.88	**100**
3	East	9	8	3	20	45	40	15	**100**
4	Central	14	5	-	19	73.68	26.32	-	**100**
Total		**42**	**24**	**5**	**71**	**59.15**	**33.8**	**7.04**	**100**

Source: *Field survey, 2016-17*

5.1.2 Area of cultivation in Permanent Land

Respondents cultivated permanent lands either wholly or partially according to their convenience. They cultivated permanent crops in certain portion of land and at the same time they also practice jhum cultivation in certain portion of the same plot. The area of permanent land cultivated on average was 2.29 acre ranging from 1 acre to 12.5 acre with standard deviation of 2.69. The respondents in central zone had comparatively less area of cultivation in permanent land with an average area of 1.6 acre as compared to their counterparts in other zones (Table 5.4).

Table 5.4: Area of cultivation in permanent land

(in Acre)

Sl. no	Zone	Area of cultivation in PL			
		Minimum	Maximum	Mean	Std. Dev
1	South	1	12.5	2.35	3.05
2	West	1.5	10	2.58	3.37
3	East	1	8	2.65	2.54
4	Central	1	4	1.60	1.57
Overall		**1**	**12.50**	**2.29**	**2.70**

Source: *Field survey, 2016-17*

The results in Table 5.5 show that 20 percent of respondent did not cultivate in permanent land. Among those who utilized permanent lands for cultivation, the size of land cultivated by highest number (31.25%) of respondents was '3 – 6 acres' followed by respondents belonging to those who cultivated 'below 3 acre' with 17.50 percent while least number (7.50%) reported to cultivate '20 acre or more.'

Table 5.5: Distribution of respondents according to area of cultivation in permanent land

(in Acre)

Sl. no	Area	Zone				Total
		South	West	East	Central	
		Number				
1	Below 3	3	4	3	4	14
2	3 to 6	8	3	6	8	25
3	6 to 9	1	3	5	1	10
4	9 to 12	5	2	0	2	9
5	12 and above	1	2	3	0	6
6	Not cultivated	2	6	3	5	16
	Total	**20**	**20**	**20**	**20**	**80**
		Percent				
1	Below 3	15	20	15	20	17.50
2	3 to 6	40	15	30	40	31.25
3	6 to 9	5	15	25	5	12.50
4	9 to 12	25	10	0	10	11.25
5	12 and above	5	10	15	0	7.50
6	Not cultivated	10	30	15	25	20
	Total	**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

5.1.3 Jhum land

The area of jhum land cultivated by rural households may vary based on availability of able-worker in a family, number of family members and availability of cultivable jhum land. Hence, in many cases there is no much restriction on the size of jhum plot. Individual ownership of land is recognized in certain areas usually confined to homestead and settled farm land. Each village operates in a particular

demarcated area and the power of distribution of jhum land for cultivation is vested on respective VCs.

Table 5.6 shows the data on jhum area cultivated by the respondents. As shown in the Table, the average area of jhum cultivated by the respondents was 1.94 acre ranging from a minimum of 0.5 acre and a maximum of 5 acres with a standard deviation of 1.08. The zone-wise data further reveal that the respondents in east zone had biggest jhum area with an average of 2.22 acre while respondent in central zone had the smallest with an average of 1.65 acre.

Table 5.6: Area of cultivation in jhum land

(in Acre)

Sl. no	Zone	Jhum area			
		Minimum	Maximum	Mean	Std. Dev
1	South	1	5	2.05	1.05
2	West	1	4	1.85	1.04
3	East	1	5	2.22	1.26
4	Central	0.5	4	1.65	0.93
Overall		**0.5**	**5**	**1.94**	**1.08**

Source: *Field survey, 2016-17*

The area of jhum land managed by the respondent household as seen in Table 5.7 reveal that the jhum area cultivated by highest number (38.75%) measured '1 – 2 acres' followed by those who cultivated '2 – 3 acres' with 36.25 percent. It may further be observed seen that there were 11.25 percent who cultivated '3 – 4 acres' of jhum land while equal number of respondents with 5 percent each reported to cultivate 'less than 1 acre' and '4 – 5 acres' of jhum land. Few respondents (3.75%) reported to cultivate bigger area of '5 acres and above.'

Table 5.7: Distribution of respondents according to area of cultivation in jhum land

Sl. no	Area	Zone				Total
		South	West	East	Central	
		Number				
1	Less than 1 acre	0	2	0	2	**4**
2	1-2 acres	8	7	7	9	**31**
3	2-3 acres	9	7	7	6	**29**
4	3-4 acres	2	2	3	2	**9**
5	4-5 acres	0	2	1	1	**4**
6	5 acres and above	1	0	2	0	**3**
	Total	**20**	**20**	**20**	**20**	**80**
		Percent				
1	Less than 1 acre	0	10	0	10	**5**
2	1-2 acres	40	35	35	45	**38.75**
3	2-3 acres	45	35	35	30	**36.25**
4	3-4 acres	10	10	15	10	**11.25**
5	4-5 acres	0	10	5	5	**5**
6	5 acres and above	5	0	10	0	**3.75**
	Total	**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

5.1.4 Crops cultivated in Permanent land

As a usual practice, cash crops, horticulture crops and indigenous crops are mostly cultivated in permanent land for the purpose of selling and household consumption. There are also households who practice jhum cultivation in their permanent lands.

It can be observed from Table 5.8 that the respondents cultivated variety of crops in a particular plot of permanent land. The crops cultivated in permanent land include 1) Tree bean *(zawngtah)* (28.75%), 2) Orange *(serthlum)* (21.25%), 3) Banana *(balhla)* (20%), 4) Pineapple *(lakhuihthei)* (15%), 5) Broomstick *(hmunphian)* (13.75%), 6) Mango *(theihai)* (12.50%), 7) Climbing wattle *(khanghu)* (8.75%), 8) Lemon *(nimbu)* (8.75%), 9) Glorybower *(phuihnam)* (5%), 10) Snowflake *(kawhtebel)* (3.75%), 11) Mulberry *(theihmu)* (3.75%), 12) Passion fruit

(sapthei) (3.75%), 13) Betel nut *(kuhva)* (2.50%), 14) Coffee (2.50%), 15) Jackfruit *(lamkhuang)* (2.50%), 16) Rubber (2.50%), 17) Teak (2.50%), 18) Peach *(theite)* (2.50%), 19) Tall tree *(thingthupui)* (2.50%), 20) Gooseberry *(sunhlu)* (1.25%), 21) Wild orange *(hatkora)* (1.25%), 22) Papaya *(thingfanghma)* (1.25%), 23) Strawberry (1.25%), 24) Sugarcane *(fu)* (1.25%) and 25) Tamarind *(tengtere)* (1.25%).

Table 5.8: Crops cultivated in Permanent Land

Sl. no	Crops	Number					Percent				
		South	East	West	Central	Total	South	East	West	Central	Total
1	Tree bean	8	7	-	8	**23**	10	8.75	-	10	**28.75**
2	Orange	5	7	-	5	**17**	6.25	8.75	-	6.25	**21.25**
3	Banana	6	4	-	6	**16**	7.50	5	-	7.50	**20**
4	Pineapple	4	1	-	7	**12**	5	1.25	-	8.75	**15**
5	Broomstick	-	1	6	4	**11**	-	1.25	7.50	5	**13.75**
6	Mango	6	1	-	3	**10**	7.50	1.25	-	3.75	**12.5**
7	Climbing wattle	-	4	-	3	**7**	-	5	-	3.75	**8.75**
8	Neembu	4	-	-	3	**7**	5	-	-	3.75	**8.75**
9	Glorybower	1	3	-	-	**4**	1.25	3.75	-	-	**5**
10	Snowflake	-	2	-	1	**3**	-	2.50	-	1.25	**3.75**
11	Mulberrries	1	1	-	1	**3**	1.25	1.25	-	1.25	**3.75**
12	Passion Fruit	-	1	-	2	**3**	-	1.25	-	2.5	**3.75**
13	Betel Nut	-	-	2	-	**2**	-	-	2.50	-	**2.50**
14	Coffee	2	-	-	-	**2**	2.50	-	-	-	**2.50**
15	Jackfruit	-	1	-	1	**2**	-	1.25	-	1.25	**2.50**
16	Rubber	-	-	1	1	**2**	-	-	1.25	1.25	**2.50**
17	Teak	-	-	1	1	**2**	-	-	1.25	1.25	**2.50**
18	Peach	2	-	-	-	**2**	2.50	-	-	-	**2.50**
19	Tall tree	-	-	-	2	**2**	-	-	-	2.50	**2.50**
20	Gooseberry	1	-	-	-	**1**	1.25	-	-	-	**1.25**
21	Wild orange	1	-	-	-	**1**	1.25	-	-	-	**1.25**
22	Papaya	-	1	-	-	**1**	-	1.25	-	-	**1.25**
23	Strawberry	1	-	-	-	**1**	1.25	-	-	-	**1.25**
24	Sugarcane	-	-	-	1	**1**	-	-	-	1.25	**1.25**
25	Tamarind	-	1	-	-	**1**	-	1.25	-	-	**1.25**

Source: *Field survey, 2016-17*

5.1.5 Crops Cultivated in Jhum Land

Mixed cropping is usually practiced in jhum cultivation. Vegetable seeds are sown along the boundary line of jhum field or in patches considered unsuitable for paddy (Singh, 1996). Varieties of seeds are sown according to the preferences of households.

The jhum crops cultivated by the respondent households are listed in Table 5.9. The list include 1) Bird's eye chilli *(zo chilli)* (78.75%), 2) Rice *(buh)* (76.25%), 3) Brinjal *(bawkbawn)* (71.25%), 4) Cowpea *(behlawi)* (61.25%), 5) Pumkin *(mai)* (61.25%), 6) Bitter tomato *(samtawk)* (53.75%), 7) Yam *(bal)* (47.50%), 8) Maize *(vaimim)* (45%), 9) Ginger *(sawhthing)* (41.25%), 10) Sour tea *(anthur)* (33.75%), 11) Ash gourd *(maipawl)* (26.25%), 12) Cucumber *(fanghma)* (25%), 13) Green chilli *(hmarchapui)* (25%), 14) Sesamum *(chhawhchhi)* (22.50%), 15) Bittergourd *(changkha)* (21.25%), 16) Mustard *(antam)* (17.50%), 17) Lady's finger *(bawrhsaia be)* (13.75%), 18) Snakegourd *(berual)* (12.50%), 19) Summer mint *(lengser)* (7.50%), 20) Celery *(pardi)* (7.50%), 21) American basil *(runhmui)* (7.50%), 22) Toothache plant *(ankasa)* (6.25%), 23) Bean (5%), 24) Rajmah (5%), 25) Watermelon *(dawnfawh)* (5%), 26) Soyabean *(bekang)* (3.75%), 27) hyacinth bean *(bepui)* (3.75%), 28) Corriander *(dhania)* (3.75%), 29) Potato *(alu)* (3.75%), 30) Sweet potato *(kawlbahra)* (2.50%), 31) Cabbage *(zikhlum)* (2.50%) , 32) Cape yellowwood *(chingit)* (2.50%), 33) Mask melon *(hmazil)* (2.50%), 34) Spine gourd *(maitamtawk)* (2.50%), 35) Coco yam *(baibing)* (1.25%), 36) Pigeon pea *(behliang)* (1.25%), 37) Capsicum (1.25%), 38) Mulberry *(theihmu)* (1.25%) and 39) Tobacco *(vaihlo)* (1.25%).

Table 5.9: Crops cultivated in jhum land

Sl. no	Jhum crop	Number					Percent				
		South	East	West	Central	Total	South	East	West	Central	Total
1	Bird's eye chilli	14	14	20	15	**63**	17.50	17.50	25	18.75	**78.75**
2	Rice	17	11	20	13	**61**	21.25	13.75	25	16.25	**76.25**
3	Brinjal	15	14	16	12	**57**	18.75	17.50	20	15	**71.25**
4	Cowpea	11	8	15	15	**49**	13.75	10	18.75	18.75	**61.25**
5	Pumkin	16	12	14	7	**49**	20	15	17.50	8.75	**61.25**
6	Bitter Tomato	14	15	6	8	**43**	17.50	18.75	7.50	10	**53.75**
7	Yam	3	9	9	17	**38**	3.75	11.25	11.25	21.25	**47.50**
8	Maize	13	4	5	14	**36**	16.25	5	6.25	17.50	**45**
9	Ginger	8	15	-	10	**33**	10	18.75	-	12.50	**41.25**
10	Sour Tea	16	5	-	6	**27**	20	6.25	-	7.50	**33.75**
11	Ash gourd	8	3	10	-	**21**	10	3.75	12.50	-	**26.25**
12	Cucumber	6	1	7	6	**20**	7.50	1.25	8.75	7.50	**25**
13	Green chilli	13	2	-	5	**20**	16.25	2.50	-	6.25	**25**
14	Sesamum	1	-	16	1	**18**	1.25	-	20	1.25	**22.50**
15	Bittergourd	4	6	4	3	**17**	5	7.50	5	3.75	**21.25**
16	Mustard	-	11	1	2	**14**	-	13.75	1.25	2.50	**17.50**
17	Lady's finger	4	3	1	3	**11**	5	3.75	1.25	3.75	**13.75**
18	Snakegourd	-	6	4	-	**10**	-	7.50	5	-	**12.50**
19	Summer mint	4	1	-	1	**6**	5	1.25	-	1.25	**7.50**
20	Celery	3	-	2	1	**6**	3.75	-	2.50	1.25	**7.50**
21	American basil	6	-	-	-	**6**	7.50	-	-	-	**7.50**
22	Toothache plant	2	1	1	1	**5**	2.50	1.25	1.25	1.25	**6.25**
23	Bean	-	4	-	-	**4**	-	5	-	-	**5**
24	Rajmah	2	2	-	-	**4**	2.50	2.50	-	-	**5**
25	Watermelon	-	-	3	1	**4**	-	-	3.75	1.25	**5**
26	Soyabean	2	1	-	-	**3**	2.50	1.25	-	-	**3.75**
27	Hyacinth bean	-	2	-	1	**3**	-	2.5	-	1.25	**3.75**
28	Corriander	2	1	-	-	**3**	2.50	1.25	-	-	**3.75**
29	Potato	2	1	-	-	**3**	2.50	1.25	-	-	**3.75**
30	Sweet potato	0	2	-	-	**2**	-	2.5	-	-	**2.50**
31	Cabbage	1	1	-	-	**2**	1.25	1.25	-	-	**2.50**
32	Cape yellowwood	-	-	-	2	**2**	-	-	-	2.50	**2.50**
33	Mask melon	-	-	2	-	**2**	-	-	2.50	-	**2.50**
34	Spine gourd	2	-	-	-	**2**	2.50	-	-	-	**2.50**
35	Coco yam	-	1	-	-	**1**	-	1.25	-	-	**1.25**
36	Pigeon pea	-	1	-	-	**1**	-	1.25	-	-	**1.25**
37	Capsicum	1	-	-	-	**1**	1.25	-	-	-	**1.25**
38	Mulberry	-	1	-	-	**1**	-	1.25	-	-	**1.25**
39	Tobacco plant	1	-	-	-	**1**	1.25	-	-	-	**1.25**

Source: *Field survey, 2016-17*

5.1.6 Fallow period

Shifting cultivation is a system of cultivation where land is prepared and managed for specific period and again left fallow to regain its fertility naturally. In order to regain the natural fertility of the soil, the land is abandoned and unused for certain period, which is known as "fallow period." The duration of fallow periods varies on location of the plot and condition of the soil. Sachchidananda (1989) wrote that the higher the density of population the shorter the jhum cycle. Singh (1996) mentioned that fallow period varies from village to village ranging from 3 – 20 years while Ralte (2015) urges that jhum cycle has been narrowed down to 5 – 10 year; then it was 15 years.

The respondents were asked of the fallow period they followed. The results as shown in Table 5.10 reveal that the fallow period followed by the respondnets on average was 9.16 years ranging from minimum was 3 years to a maximum was 15 years. The fallow period was longest in central zone with 10.75 years followed by east zone with 9.45 years while west zone had shortest fallow period with 7.8 years.

Table 5.10: Fallow period

Sl. no	Zone	Fallow period			
		Minimum	Maximum	Mean	Std. Dev.
1	South	3	12	8.65	3.08
2	West	4	10	7.8	2.09
3	East	8	15	9.45	1.64
4	Central	8	15	10.75	2.65
Overall		**3**	**15**	**9.16**	**2.62**

Source: *Field survey, 2016-17*

Table 5.11 further presents the results of distribution of the respondents according to fallow period. The results show that majority (52.5%) of the respondents followed '10 - 15 years' of fallow period while a little over one-third (35%) respondents followed a fallow period of '5 – 10 years.' Few (7.50%)

respondents followed a fallow period of '15 years and above' while the fallow period followed by the rest (5%) was 'below 5 years.'

Table 5.11: Categorisation of respondents according to fallow period

Sl. no	Years	Zone				Total
		South	West	East	Central	
		Number				
1	Below 5 years	3	1	0	0	**4**
2	5 -10 years	4	11	8	5	**28**
3	10 - 15 years	13	8	11	10	**42**
4	15 years & above	0	0	1	5	**6**
	Total	**20**	**20**	**20**	**20**	**80**
		Percent				
1	Below 5 years	15	5	0	0	**5**
2	5 -10 years	20	55	40	25	**35**
3	10 - 15 years	65	40	55	50	**52.50**
4	15 years & above	0	0	5	25	**7.50**
	Total	**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

5.2 Shifting Cultivation Activities

Seavoy (1973) defined shifting cultivation as "clearing a patch of forest by felling and burning trees and then cultivating this land for one or more years before abandoning it in favour of other patches."

Shifting cultivation involves various stages of activities. The periodic cycle of shifting cultivation in Mizoram is presented in Figure 1.1.

1) **Allotment of jhum sites –** Allotment of jhum sites is usually performed in the month of September to November. The village council would call meeting of villagers who are planning to take up jhum cultivation for the upcoming year.
2) **Demarcation of boundaries –** Demarcation of individual plot is done soon after jhum sites are selected. Jhum boundaries are marked in aid of landmarks

and signs, cutting bamboos, natural landscape such as river, mountain, trees, slopes etc.

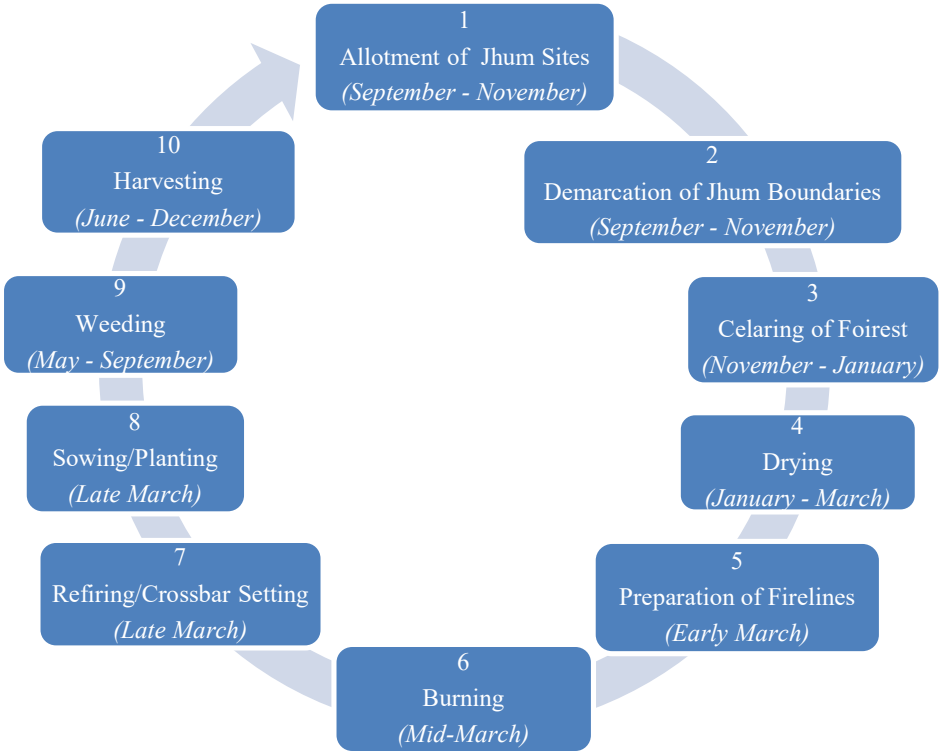


Figure 5.1: Periodic Cycle of Shifting Cultivation in Mizoram

3) **Clearing the forest –** Clearing the forest generally starts from November till the month of January. The time of allotment of jhum sites also determine the time of clearing the forest.

4) **Drying (Vahchap) –** Drying is a condition in which felled bamboos and trees are kept for sun dry. Drying period begins soon after clearing the forest till the day of burning.

5) **Preparation of fire lines –** Fire lines are prepared prior to the days of burning.

6) **Burning –** Burning of jhum plot is completed before 15th of March or not later, depending on local weather condition. The time of burning is fixed and restricted by the state government and enforced through Village Council as

late burning increases the danger of fire spreading to the surrounding dry vegetation.

7) **Refiring (Mangkhawh) and cross bar setting (Changkham) –** Refiring is usually done on the following days of burning. There may be some unburnt material left in the plot after firing; this is either gathered or re-burnt, or used as fencing material or supports for climbers. On a steep slope, bamboo or trunk is placed horizontally in a sequence which is attached firmly on the ground in both ends with twigs or trunks to retain washing away the top soil due to rainfall and wind, which is known as 'crossbar setting'. In a slope and steep land, there is a possibility of washing away the top soil due to natural reaction of rainfall and wind. In such cases, cross bar setting are prepared for the prevention of soil erosion. Cross bar setting are usually prepared at the time of refiring.

8) **Sowing –** Farmers start sowing immediately after burning. Most of them prefer to sow seeds on the following days of burning as the salinity of soil due to burning promotes the growth of crops and add nutrients to the soil. Mixed cropping is commonly practice. Meanwhile, materials for construction of jhum hut are collected from nearby vegetation (Vau). Men are engage in constructing jhum hut while women are busy in sowing and helping the construction when needed.

9) **Weeding –** Weeding of jhum land is carried out by the end of May, weeding starts continuously till September. Every adult member from the family are busy in the field as weeding is the most laborious of all steps that demand more time and energy. Generally, three or four rounds of weeding are required in a season.

10) **Harvesting –** Harvesting of crops is the final activity in the field under shifting cultivation system. Harvesting period starts from June till December.

The activities under shifting cultivation are divided into four stages viz. 1) Site selection and land preparation (allotment of jhum site, cutting/clearing of forest, drying and burning), 2) Production (sowing, weeding), 3) Harvesting (harvesting and transportation) and 4) Post-harvest (processing and selling/marketing).

5.2.1 Site Selection and Land Preparation

5.2.1.1 Allotment of Jhum Site

The typical village in Mizoram has a small, compact habitation area, surrounded or bordered by village forest reserves. Barring other forest reserves which may have been notified, jhumming is permitted on the remaining land. However, not all land is cultivable. In some villages, a large part of the hills cannot be jhummed on account of rocky outcrops, steep slopes, or high altitude. People can easily identify the slopes that were jhummed in each successive year of the jhum cycle and have even given them local names. There is no restriction on the size of the plot (Singh, 1996). The time of allotment of jhum sites may vary yearly depending on the convenience of VC and local condition in each village. For example, in the state of Tripura, among the Riang tribal groups, selection of site for cultivation is held in the month of September-November which is followed by clearing the forest (Bera, 2012).

Jhum sites for the upcoming years of cultivation are pre-determined by the VC, elders and prominent citizens of the village considering its natural vegetation, terrain, connectivity and accessibility of the land. At the time of allotment of the plot, representative from each household willing to pursue cultivation for the

consecutive year would be present, mostly head of the household and in their absence the female heads of the households would be present.

It was noticed that out of 16 villages of the study area in Mizoram, no allotment of jhum site was made in six villages i.e. Theiri, Tisi, Tuipuibari, Rajiv Nagar, Zawlnuam and Ander-Manik in the previous year of data collection due to unavailability of village reserve area. In such condition, rural households practiced shifting cultivation in their permanent land. In the case of landless households, village reserve areas were made available for cultivation. There were also cases where shifting cultivation is practiced on temporary basis for a year or more in the plots of friends, relatives or neighbours based on mutual understanding.

The data on allotment of jhum sites as shown in Table 5.12 reveal that large number (40%) of respondents practiced jhum cultivation in permanent land in the year of data collection. The respondents who practiced jhum in permanent lands were all respondents in west zone, respondents in east zone (35%) and respondents in south zone (25%).

Of the respondents for who cultivated jhum lands allotment of jhum sites for 22.5 percent of the respondents was given in September. On the other hand, allotment for 21.25 percent was made in the month of while October while allotment for 12.50 percent was made in the month of December. Allotment of jhum site for the rest (3.75%) was made in the month of November.

The zone wise data further reveal that allotment of jhum sites for most (65%) of the respondents was done in the month of September while for most (60%) of the respondents in south zone the allotment was done in October and site allotment for 50 percent of the respondents in central zone was done in December (Table 5.12).

Table 5.12: Time of site allotment for jhum

Sl. no	Month	Zone				Total
		South	West	East	Central	
		Number				
1	Permanent land	5	20	7	0	**32**
2	September	0	0	13	5	**18**
3	October	12	0	0	5	**17**
4	November	3	0	0	0	**3**
5	December	0	0	0	10	**10**
	Total	**20**	**20**	**20**	**20**	**80**
		Percent				
1	Permanent land	25	100	35	0	**40**
2	September	0	0	65	25	**22.50**
3	October	60	0	0	25	**21.25**
4	November	15	0	0	0	**3.75**
5	December	0	0	0	50	**12.50**
	Total	**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

5.2.1.2 Cutting/clearing forest

It is conceived that cutting or clearing vegetation as early as in autumn allows better decomposition and improves yields. However, bamboo sites are generally preferred over tree forest. Trees take longer to cut and dry, and do not burn as well as bamboo. However, it is preferable to accomplish cutting and clearing at the earliest for better drying of the plot before burning. Jhum boundaries are marked with the aid of landmarks and signs, such as bamboo tied in the form of a cross *(perh)* and are recorded by the VC.

Of all jhum operations, clearing forest and cutting trees is the only task exclusively carried out by men folk. The task of clearing and cutting forest is the toughest and most laborious activity of all jhummed process. Women, old aged and children are hardly involved in the task as it requires able-bodied men to clear the land. The task of cutting or clearing forest is usually handled by individual households. In cases where no male members are available, neighbours, friends and

relatives may also help in clearing. In some cases, hired labours are also engaged if the work on cutting or clearing of forest is getting delayed.

The results on time of clearing forest as presented in Table 5.13 show that the time of clearing starts as early as September (the year before) and for those who are a little late they took up the task of clearing in the month of January (the same year). The results further show that majority (68.75%) of the respondents cleared forest in the month of January followed by those who did the clearing in October with 12.5 percent. Equal numbers of 8.75 percent each had November and December as their time of clearing while the time of clearing for the rest (1.25%) is September.

Table 5.13: Time of clearing forest

Sl. no	Month	Zone				Total
		South	West	East	Central	
		Number				
1	September	0	0	1	0	1
2	October	0	0	10	0	10
3	November	1	0	6	0	7
4	December	1	5	1	0	7
5	January	18	15	2	20	55
Total		**20**	**20**	**20**	**20**	**80**
		Percent				
1	September	0	0	5	0	1.25
2	October	0	0	50	0	12.5
3	November	5	0	30	0	8.75
4	December	5	25	5	0	8.75
5	January	90	75	10	100	68.75
Total		**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

The zone wise data (Table 5.13) further reveal that most of the respondents who cleared forest in the month of January belonged to central zone (100%), south zone 990%) and west zone (75%) while most (80%) of the respondents in east zone cleared forest in the months of October and November.

5.2.1.3 Drying

Felled bamboo and trees are left for sundry. The felled bamboo and trees should completely be dried to ensure hard and complete firing at the time of burning. The time of cutting and clearing forest determines the duration of drying period and the drying period varies from place to place. The longer the drying period the harder will be the burning and firing of the plot.

Fireline are prepare prior to the day of burning or even earlier in order to prevent spreading of fire in the nearby vegetation. Buffer zone is prepared by clearing dried leaves and twigs in the adjoining area of jhum plot and nearby vegetation so that fire will not spread beyond the buffer zone or areas.

Drying period the jhum plots as practiced by the respondents is presented in Tables 5.14 and 5.15. As shown in Table 5.14, the drying period on average was 64.25 days ranging from a minimum of 30 days and a maximum of 150 days with standard deviation of 24.47. The drying period of east zone was longest with 99 days followed by south zone with 56.25 days and central zone with 55 days while west zone had shortest duration of drying with 46.75 days.

Table 5.14: Drying period

(in Days)

Sl. no	Zone	Fallow period			
		Minimum	Maximum	Mean	Std. Dev.
1	South	30	100	56.25	13.36
2	West	30	80	46.75	11.50
3	East	60	150	99	19.97
4	Central	45	60	55	5.38
Overall		**30**	**150**	**64.25**	**24.47**

Source: *Field survey, 2016-17*

The respondents are further distributed according to various drying periods and the results are presented in Table 5.15. As seen in the Table, the largest number

(42.50%) of the respondents left the jhum fields for '30 – 60 days' for drying followed by those who kept their jhum plots for '60 – 90 days' for drying while the drying period for rest (22.50%) of the respondents was for '90 – 150 days.'

Table 5.15: Distribution of respondents according to drying period

Sl. no	Zone	Number				Percent			
		30-60 Days	60-90 Days	90-150 Days	Total	30-60 Days	60-90 Days	90-150 Days	Total
1	South	9	10	1	**20**	11.25	12.50	1.25	**25**
2	West	15	5	-	**20**	18.75	6.25	-	**25**
3	East	0	3	17	**20**	-	3.75	21.25	**25**
4	Central	10	10	-	**20**	12.50	12.50	-	**25**
Total		**34**	**28**	**18**	**80**	**42.50**	**35**	**22.50**	**100**

Source: *Field survey, 2016-17*

5.2.1.4 Burning

The correct timing of burning is of utmost importance in jhumming. The burning should take place at a stage when the felled bamboos or trees are completely dried so that they burn well. Late burning increases the risk of spreading fire to surrounding vegetation. Untimely rains also delay both drying and burning, which if left incomplete leads to poor crop performance.

Generally, burning of jhum plots in Mizoram take place during the month of March. The state Government fixes a date for burning plot that usually falls on or before 15th of March, depending on local weather conditions. The VCs declare suitable day(s) for burning in their respective villages. The time and date of burning is strictly enforced by the VCs as late burning increases the risk of fire spreading in the nearby vegetation.

From information provided by the respondents, burning of jhum plots mostly took place in the month of March (98.75%) while there was only 1 (1.25%) case of burning in the month of February (Table 5.16).

Table 5.16: Time of burning

Sl. no	Zone	Number			Percent		
		February	March	Total	February	March	Total
1	South	1	19	**20**	1.25	23.75	**25**
2	West	-	20	**20**	-	25	**25**
3	East	-	20	**20**	-	25	**25**
4	Central	-	20	**20**	-	25	**25**
Total		**1**	**79**	**80**	**1.25**	**98.75**	**100**

Source: *Field survey, 2016-17*

The duration of burning jhum land depends on the size of the plot, direction and velocity of wind, local weather condition and drying condition of the felled trees. Normally, burning plot is completed in a day.

The results presented in Table 5.17 show that the duration of burning in most (67.50%) cases lasted for '1 – 2 hours' followed by the duration of '2 – 3 hours' with 13.75 percent and 'less than 1 hour' with 10 percent.

Table 5.17: Duration of burning

Sl. no	Duration	Zone				Total
		South	West	East	Central	
		Number				
1	Less than 1 hour	1	1	1	5	**8**
2	1 - 2 hours	8	12	19	15	**54**
3	2 - 3 hours	4	7	0	0	**11**
4	3 - 4 hours	5	0	0	0	**5**
5	4 - 5 hours	1	0	0	0	**1**
6	5 hours & above	1	0	0	0	**1**
Total		**20**	**20**	**20**	**20**	**80**
		Percent				
1	Less than 1 hour	5	5	5	25	**10**
2	1 - 2 hours	40	60	95	75	**67.50**
3	2 - 3 hours	20	35	0	0	**13.75**
4	3 - 4 hours	25	0	0	0	**6.25**
5	4 - 5 hours	5	0	0	0	**1.25**
6	5 hours & above	5	0	0	0	**1.25**
Total		**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

The duration of burning for 6.25 percent was '3 – 4 hours' while equal numbers of 1.25 percent each reported the duration of burning as '4 – 5 hours' and '5 hours and above.'

There were also cases where jhum plots had to be re-burnt as there were residuals left in the plots at the time of burning. Trunks of bamboos, twigs and logs were re-burnt and collected for use as material for cross bar, construction of jhum huts, firewood and fencing purposes. The respondents also set cross bars with appropriate intervals in steep and slope areas to prevent washing away the topsoil by natural reactions of rain and wind. For this, they used twigs and shrub of trees which they collected from the burnt fields and uniformly fixed them in parallel to form a terracing pattern. Areas with gentle slope are left without cross bar setting as the ashes and topsoils remain intact.

5.2.2 Production Activities

5.2.2.1 Sowing

Sowing starts soon after the burning. Varieties of seeds are sown in a pit or thrown on the soil. It was learnt from the interaction with respondents that sowing seeds soon after burning promote the growth of crops as the salinity of soil provides organic manure to the seeds. The time of sowing seeds differ as seeds are not sown at a time. Some seeds are sown soon after burning which are referred as early crops while others are sown lately after a month of burning which are referred to as late crops.

Among the jhum crops cultivated by the respondents, major crops with comparatively larger number of cultivators are identified for the purpose of discussion on the quantity of seeds sown. Table 5.18 presents list of major crops with the quantity of seeds sown by the respondents. The average quantity of bird's

eye chilli seeds sown by 78.75 percent of the respondents was 2 kgs while the average quantity of rice cultivated by 76.25 percent of the respondents was 2.16 tins.

Table 5.18: Quantity of seeds sown

Crop	Zone	No of HH cultivated		Sown			
		Number	Percent	Unit of Measurement			
				Grams	Kg	Tin	Cob
Bird's eye chilli	South	14	17.50	-	1.46	-	-
	West	14	17.50	-	2.35	-	-
	East	20	25	-	1.50	-	-
	Central	15	18.75	-	2.53	-	-
Total		**63**	**78.75**	-	**2**	-	-
Rice	South	17	21.25	-	-	1.79	-
	West	11	13.75	-	-	3.02	-
	East	20	25	-	-	1.81	-
	Central	13	16.25	-	-	1.61	-
Total		**61**	**76.25**	-	-	**2.16**	-
Brinjal	South	15	18.75	250	-	-	-
	West	14	17.50	250	-	-	-
	East	16	20	250	-	-	-
	Central	12	15	500	-	-	-
Total		**57**	**71.25**	**312.50**	-	-	-
Cowpea	South	11	13.75	250	-	-	-
	West	8	10	250	-	-	-
	East	15	18.75	500	-	-	-
	Central	15	18.75	500	-	-	-
Total		**49**	**61.25**	**375**	-	-	-
Bitter Tomato	South	14	17.50	250	-	-	-
	West	15	18.75	250	-	-	-
	East	6	7.50	250	-	-	-
	Central	8	10	250	-	-	-
Total		**43**	**53.75**	**250**			
Yam	South	3	3.75	-	5.33	-	-
	West	9	11.25	-	7.77	-	-
	East	9	11.25	-	21.66	-	-
	Central	17	21.25	-	18	-	-
Total		**38**	**47.50**	-	**15.44**	-	-
Maize	South	13	16.25	-	-	-	19.23
	West	4	5	-	-	-	7
	East	5	6.25	-	-	-	13.75
	Central	14	17.50	-	-	-	15.42
Total		**36**	**45**	-	-	-	**15.44**

Table 5.18: Quantity of seeds sown (Contd..)

Crop	Zone	No of HH cultivated		Sown			
		Number	Percent	Unit of Measurement			
				Grams	Kg	Tin	Cob
Ginger	South	8	10	-	209.50	-	-
	West	15	18.75	-	-	-	-
	East	-	-	-	378	-	-
	Central	10	12.50	-	265	-	-
Total		**33**	**41.25**	-	**302.90**	-	-
Green chilli	South	13	16.25	-	4.07	-	-
	West	2	2.50	-	-	-	-
	East	-	-	-	1	-	-
	Central	5	6.25	-	2.70	-	-
Total		**20**	**25**	-	**3.42**	-	-

Source: *Field survey, 2016-17*

Brinjal was cultivated by 71.25 percent of the respondents and the average quantity of seed sown was 312.50 grams. On the other hand, cowpea was cultivated by 61.25 percent of the respondents and the amount of seeds sown on average was 375 grams. There were 53.75 percent respondents who cultivated bitter tomato with an average of 250 grams of seeds sown. Yam was cultivated by 47.50 percent of the respondents with an average of 15.44 kgs of seen sown (Table 5.18).

The respondents who cultivated maize accounted for 45 percent while the average quantity of seed sown by them was 15.44 cobs. There were also respondents who cultivated ginger (41.25%) and green chilli (25%) and the quantity of seeds sown by them was 302.90 kgs and 3.42 kgs respectively (Table 5.18).

5.2.2.2 Weeding

Ralte (2015) in pointing out the process of weeding stated that normally three to four weeding are done in a year from the time of sowing to harvesting. By this process, all the noxious weeds are removed with the help of small hand hoes by the womenfolk and curved daos by the men.

The data on the number of weeding performed by the respondents presented in Table 5.19 reveal that majority (77.50%) of the respondents performed three rounds of weeding in a year or one jhum cycle. Few respondents (16.25%) reported to perform four rounds of weeding while the rest (6.25%) performed two rounds of weeding in one whole jhum cycle.

Table 5.19: Weeding rounds

Sl. no	No. of rounds	Number					Percent				
		South	West	East	Central	Total	South	West	East	Central	Total
1	1 round	0	0	0	0	0	0	0	0	0	0
2	2 rounds	1	0	3	1	5	5	0	15	5	6.25
3	3 rounds	10	18	16	18	62	50	90	80	90	77.50
4	4 rounds	9	2	1	1	13	45	10	5	5	16.25
	Total	**20**	**20**	**20**	**20**	**80**	**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

With regards to the time of weeding, the respondents performed their first round of weeding during April to June wherein half (50%) of them performed weeding in May while about one-third (33.75%) of them performed weeding in June and the rest (16.25%) performed weeding in April (Table 5.20).

Weeding round may last for a week or longer depending on the intensity of weed growth. In cases when more rainfalls are experienced, the next round of weeding starts right after the completion of previous round. The respondents performed their second round of weeding starting from May to August whereby most (51.25%) of them had to perform the weeding in July. Over one-third (36.25%) performed second weeding in June while the rest 11.25 percent and 1.25 percent performed their second weeding in August and May respectively (Table 5.20).

Table 5.20: Time of weeding

Month	Number					Percent				
	South	West	East	Central	Total	South	West	East	Central	Total
First round										
April	2	10	1	0	**13**	10	50	5	0	**16.25**
May	17	7	12	4	**40**	85	35	60	20	**50**
June	1	3	7	16	**27**	5	15	35	80	**33.75**
Total	**20**	**20**	**20**	**20**	**80**	**100**	**100**	**100**	**100**	**100**
Second Round										
May	1	0	0	0	**1**	5	0	0	0	**1.25**
June	7	15	6	1	**29**	35	75	30	5	**36.25**
July	10	3	11	17	**41**	50	15	55	85	**51.25**
August	2	2	3	2	**9**	10	10	15	10	**11.25**
Total	**20**	**20**	**20**	**20**	**80**	**100**	**100**	**100**	**100**	**100**
Third round										
July	2	7	3	0	**12**	10	35	15	0	**15**
August	4	10	7	15	**36**	20	50	35	75	**45**
September	11	2	7	3	**23**	55	10	35	15	**28.75**
October	1	1	0	1	**3**	5	5	0	5	**3.75**
November	1	0	0	0	**1**	5	0	0	0	**1.25**
No weeding	1	0	3	1	**5**	5	0	15	5	**6.25**
Total	**20**	**20**	**20**	**20**	**80**	**100**	**100**		**100**	**100**
Fourth round										
August	2	0	1	0	**3**	10	0	5	0	**3.75**
September	3	1	0	0	**4**	15	5	0	0	**5**
October	4	1	0	1	**6**	20	5	0	5	**7.5**
No weeding	11	18	19	19	**67**	55	90	95	95	**83.75**
Total	**20**	**20**	**20**	**20**	**80**	**100**	**100**	**100**	**100**	**100**

Source: *Field survey, 2016-17*

The results in Table 5.20 further show that the third round of weeding was performed during the months of July to November. There were few (6.25%) respondents who did not perform the third round of weeding. Among the respondents who performed third round of weeding, the highest number (45%) of respondents carried out the weeding in August followed by those who did the weeding in September with 28.5 percent and in July with 15 percent. Rest of the respondents took up their third weeding in the months of October and November with 3.75 percent and 1.25 percent respectively.

It appears from the results that the fourth round of weeding was not required for most (83.75%) of the respondents while it is required only for lesser number

(16.25%) of respondents. The time for fourth round of weeding falls more or less within the same time with the third round of weeding starting from August till October. The respondents who performed their fourth round of weeding in August accounted for 3.75 percent while those who performed the weeding in September and October accounted for 5 percent and 7.50 percent respectively (Table 5.20).

5.2.3 Harvesting Activities

5.2.3.1 Harvesting of Crops

Harvesting period starts from the month of May. Early crops sown soon after burning i.e. March are ready for harvest as early as May. Table 5.21 show the time of harvest for selected jhum crops wherein the early crops such as brinjal, pumpkin are ready for harvest by May and crops like bitter tomato maize, sour tea, cowpea, bitter gourd are ready for harvest by June. The later crops crops like yam, bird's eye chilli, and green chilli are ready for harvest by July and August.

Table 5.21: Time of harvest

Sl. no	Crop	Time of harvest	
		From	To
1	Brinjal	May	July
2	Pumpkin leave	May	July
3	Bitter tomato	June	September
4	Maize	June	September
5	Sour tea	June	September
6	Cowpea	June	October
7	Bitter gourd	June	October
8	Yam	July	November
9	Bird eye chilli	August	December
10	Green chilli	August	December
11	Rice	October	November
12	Ginger	January	March

Source: *Field survey, 2016-17*

Jhum rice is ready for harvest by October while ginger is ready for harvest in January of the succeeding year. There were some cases where respondents did not

harvest their gingers at the time of regular harvest due to low market price. The gingers were left in the jhum for harvest till they could get favourable market price (Table 5.21).

It may be noted that as a usually practice, crops are not harvested at one go instead the harvest period as seen in Table 5.21 stretch over about three, four or even five months. The quantity of harvest at a time varies depending on requirements of individual households.

Jhum crops cultivated by comparatively more number of respondents are identified for the purpose of further discussion to understand the quantity sown and the quantity of harvest. The results on quantity of major crops sown and harvest are shown in Table 5.22. As shown in the Table, the quantity of bird eye chilli sown by 78.75 percent of the respondents on average was 2 kgs out of which they could harvest an average of 84.48 kgs.

On the other hand, rice was cultivated by 76.25 percent of the respondents. The quantity of rice sown on average was 2.16 tin out of which the quantity of harvest on average was 84.29 tin. The quantity of brinjal seed sown by 71.25 percent of the respondents on average was 312.5 gms from which they could harvested 83.52 kgs on average. Cowpea was cultivated by 61.25 percent respondents with average of 375 gms sown where they could harvest 62.85 bundles on average (Table 5.22).

Bitter tomato *(samtawk)* was cultivated by 53.75 percent of the household. While quantity of bitter tomato sown on average was 250 gms the quantity of harvest on average was 41.62 kgs. The respondents who cultivated yam accounted for 47.5 percent. From the average quantity of 15.44 kgs of yam sown the quantity of harvest on everage was 117.10 kgs (Table 5.22).

Table 5.22: Quantity of harvest

Crop	Zone	No. of HH Cultivated		Sown				Harvest		
				Unit of Measurement				Unit of Measurement		
		Number	Percent	Grams	Kg	Tin	Cob	Kg	Tin	Bundle
Bird's eye chilli	South	14	17.50	-	1.46	-	-	44.28	-	-
	West	14	17.50	-	2.35	-	-	90.50	-	-
	East	20	25	-	1.50	-	-	78.46	-	-
	Central	15	18.75	-	2.53	-	-	120	-	-
Total		**63**	**78.75**	-	**2**	-	-	**84.48**	-	-
Rice	South	17	21.25	-	-	1.79	-	-	111.17	-
	West	11	13.75	-	-	3.02	-	-	70.85	-
	East	20	25	-	-	1.81	-	-	64.90	-
	Central	13	16.25	-	-	1.61	-	-	86.23	-
Total		**61**	**76.25**	-	-	**2.16**	-	-	**84.29**	-
Brinjal	South	15	18.75	250	-	-	-	41	-	-
	West	14	17.50	250	-	-	-	46.62	-	-
	East	16	20	250	-	-	-	65.71	-	-
	Central	12	15	500	-	-	-	206.66	-	-
Total		**57**	**71.25**	**312.5**	-	-	-	**83.52**	-	-
Cowpea	South	11	13.75	250	-	-	-	-	-	60.90
	West	8	10	250	-	-	-	-	-	60
	East	15	18.75	500	-	-	-	-	-	42.50
	Central	15	18.75	500	-	-	-	-	-	78
Total		**49**	**61.25**	**375**	-	-	-	-	-	**62.85**
Bitter Tomato	South	14	17.50	250	-	-	-	52.85	-	-
	West	15	18.75	250	-	-	-	8.33	-	-
	East	6	7.50	250	-	-	-	32	-	-
	Central	8	10	250	-	-	-	65	-	-
Total		**43**	**53.75**	**250**				**41.62**		
Yam	South	3	3.75	-	5.33	-	-	83.33	-	-
	West	9	11.25	-	7.77	-	-	31.11	-	-
	East	9	11.25	-	21.66	-	-	104.44	-	-
	Central	17	21.25	-	18	-	-	175.29	-	-
Total		**38**	**47.5**	-	**15.44**	-	-	**117.10**	-	-
Maize	South	13	16.25	-	-	-	19.23	110.76	-	-
	West	4	5	-	-	-	7	58	-	-
	East	5	6.25	-	-	-	13.75	100	-	-
	Central	14	17.50	-	-	-	15.42	72.14	-	-
Total		**36**	**45**	-	-	-	**15.44**	**87.22**	-	-

Source: *Field survey, 2016-17*

Table 5.22: Quantity of harvest (Contd…)

Crop	Zone	No. of HH Cultivated		Sown				Harvest		
				Unit of Measurement				Unit of Measurement		
		Number	Percent	Grams	Kg	Tin	Cob	Kg	Tin	Bundle
Ginger	South	8	10	-	209.50	-	-	1875	-	-
	West	15	18.75	-	-	-	-	-	-	-
	East	-	-	-	378	-	-	1484.66	-	-
	Central	10	12.50	-	265	-	-	1060	-	-
Total		**33**	**41.25**	-	**302.9**	-	-	**1450.6**	-	-
Green chilli	South	13	16.25	-	4.07	-	-	62.30	-	-
	West	2	2.50	-	-	-	-	-	-	-
	East	-	-	-	1	-	-	5	-	-
	Central	5	6.25	-	2.70	-	-	58	-	-
Total		**20**	**25**	-	**3.42**	-	-	**55.50**	-	-

Source: *Field survey, 2016-17*

The respondents who cultivated maize accounted for 45 percent. Out of the 15.44 cobs of maize sown they could harvest an average of 87.22 kgs of maize. Ginger was cultivated by 41.25 percent of the respondents. Out of the 302.90 kgs of ginger sown the harvest on average was 1450.60 kgs. A quarter (25%) of the respondents cultivated green chilli and they were able to harvest 55.50 kgs on average out of the 3.42 kgs of green chilli sown (Table 5.22).

5.2.3.2 Transporting of Crops

The activities of shifting cultivation do not end at harvest. The rural households have to transport the crops they harvested to their houses or markets. The respondents also had to transport their crops through head-load, private vehicle or hired vehicle. As presented in Table 5.23, majority (63.75%) of the respondents had to transport their crops by means of head-load followed by those who transported their crops by means of hired vehicles with 23.75 percent. The respondents who transported their crops by means of head-load and hired vehicle

accounted for 10 percent while the rest of only 2.50 percent transported their crops using private vehicle.

Table 5.23: Mode of Transportation

Sl. no	Route	Head-load	Head-load and hired vehicle	Hired vehicle	Private vehicle	Total
		Number				
1	Farm – Home	46	8	10	2	66
2	Farm – Roadside – Home	5	0	4	0	9
3	Farm – Market	0	0	5	0	5
	Total	**51**	**8**	**19**	**2**	**80**
		Percent				
1	Farm – Home	57.50	10	12.50	2.50	82.50
2	Farm – Roadside – Home	6.25	0	5	0	11.25
3	Farm – Market	0	0	6.25	0	6.25
	Total	**63.75**	**10**	**23.75**	**2.5**	**100**

Source: *Field survey, 2016-17*

With regards to information on the route of transportation, Table 5.23 further shows that large majority (82.50%) of the respondents transported directly from farm to home while few (11.25%) transported first to roadside and then to home and the rest (6.25%) transported their crops directly market, mostly to Aizawl market.

Information on the distance covered in transporting the crops by head-load was also collected and the results are presented in Table 5.24. The average distance covered by 69 (86.25%) respondents through head-load was 3.75 kms with a range from .50 km to 14 kms while minimum distance covered was 0.5 km and maximum with 14km and standard deviation of 2.92. The south zone had longest distance with an average of 5.03 kms followed by west zone with 4.06 kms while east zone had the least with 2.90 kms.

Table 5.24: Distance covered by head-load

(in Kilometer)

Zone	N	Min	Max	Mean	Std. Dev
South	16	1	14	5.03	4.18
West	18	1	14	4.06	3.73
East	15	0.50	5	2.90	1.38
Central	20	0.50	7	3.03	2.40
Total	**69**	**0.50**	**14**	**3.75**	**2.92**

Source: *Field survey, 2016-17*

The data on distance covered by hired vehicles as presented in Table 5.25 show that 21 (26.25%) the respondents who had to transport their crops usually covered an average distance of 13.24 kms ranging from a minimum of 1 km and a maximum of 60 kms with standard deviation of 7.23. The central zone had the longest distance with an average of 30.57 kms followed by east zone with an average of 9.92 kms while the south zone had least with 6 kms.

Table 5.25: Distance covered by hired vehicle

Zone	N	Min	Max	Mean	Std. Dev
South	6	4	10	6	2.45
West	2	4	9	6.50	3.54
East	6	1	20	9.92	6.74
Central	7	4	60	30.57	16.20
Total	**21**	**1**	**60**	**13.24**	**7.23**

Source: *Field survey, 2016-17*

Data on cost of hiring vehicles was also collected from respondents who hired vehicles and the results are presented Table 5.26. The cost of hiring vehicles was calculated based on the simple estimates of respondents for one jhum cycle. It may also be noted that hiring of vehicles in most cases is usually done on shared basis. The average cost of hiring vehicle incurred one jhum cycle by respondents for transporting the crops on average was Rs 916.13 ranging from a minimum cost of

Rs. 20/- and a maximum of Rs. 2,000/- with standard deviation of 540.20 which shows wide variation in the cost of hiring vehicles.

Table 5.26: Cost of hiring vehicle

(in Rupees)

Zone	N	Min	Max	Mean	Std. Dev
South	6	100	2000	1100	675.28
West	2	800	1000	900	141.42
East	6	20	1500	691.67	675.41
Central	7	60	1500	972.86	669.69
Total	**21**	**20**	**1500**	**916.13**	**540.20**

Source: *Field survey, 2016-17*

The cost of hiring charge was highest in south zone with an average of Rs. 1,100/- followed by central zone with an average of Rs. 972.86 while east zone had lowest with an average of Rs. 691.67 (Table 5.26).

5.2.4 Post-Harvest Activities

5.2.4.1 Processing

Harvested crops are consumed, sold or processed. Crops are processed purposively for consumption during off-season period and seeds are saved for the upcoming year. It is usual practice of most farming households in Mizoram to save seeds for own use in the next season and share with friends, relatives and neighbours in need. Harvested crops are processed by ways of sundried or smoked dried (storing in fireplace). Ralte (2015) pointed out that women are involved in processing of their produces mainly by drying and fermenting so that they can be stored for later use as well as for earning an income for the family.

Data were also collected from the respondents on whether they processed their jhum crops after harvest or not and the results are presented in Table 5.27. The crops processed by comparatively larger number of respondents include cow pea

leave (behlawi) (41.25%), bird's eye chilli (40%), sour tea (anthur) (31.25%), bitter tomato (17.70%), yam (leave) (17.70%) and brinjal (15%).

Table 5.27: Processing of crops

Sl. no	Crops	Number		Percent	
		Cultivated	Processed	Cultivated	Processed
1	Bird's eye chilli	63	32	78.75	40
2	Brinjal	57	12	71.25	15
3	Cowpea leaves	49	33	61.25	41.25
4	Bitter tomato	43	14	53.75	17.70
5	Yam (leave)	38	14	47.50	17.50
6	Maize	36	11	45	13.75
7	Sour tea	27	25	33.75	31.25
8	Green chilli	20	2	25	2.50
9	Bittergourd	17	6	21.25	7.50
10	Mustard	14	5	17.50	6.25
11	Summer mint	6	3	7.50	3.75
12	Celery	6	2	7.50	2.50
13	American basil	6	3	7.50	3.75
14	Toothache plant	5	2	6.25	2.50
15	Soya bean	3	1	3.75	1.25
16	Coco yam	5	5	6.25	6.25
17	Bamboo shoots	2	2	2.50	2.50

Source: *Field survey, 2016-17*

5.2.4.2 Marketing

Jhum crops are mainly for household consumption and the surplus if any, are sold in local market or nearby market in town to supplement household income. In some villages, there are local commissioners and traders purchasing crops from farmers in large quantity and transport to the main market.

The data on marketing of crops are presented in Table 5.28. The respondents listed a total of 31 crops which were sold by them in varied quantity. Among these, the crops marketed by comparatively larger number of the respondents as shown in the Table include bird's eye chilli (43.75%), brinjal (35%), pumkin (26.25%), yam

(leave) (22.50%), cow pea (20%), maize (20%), bitter tomato (17.50%) and sesamum (15%).

Table 5.28: Marketing of crops

Sl. no	Crops	Number		Percent	
		Cultivated	Marketed	Cultivated	Marketed
1	Toothache plant	5	1	6.25	1.25
2	Celery	6	1	7.50	1.25
3	Bitter tomato	43	14	53.75	17.50
4	Sour tea	27	6	33.75	7.50
5	Summer mint	6	3	7.50	3.75
6	Cucumber	20	7	25	8.75
7	Snake gourd	10	4	12.50	5
8	Watermelon	4	1	5	1.25
9	Mask melon	2	1	2.50	1.25
10	Sesamum	18	12	22.50	15
11	Ash gourd	18	9	22.50	11.25
12	Soyabean	3	1	3.75	1.25
13	Potato	3	3	3.75	3.75
14	Cabbage	2	1	2.50	1.25
15	Mustard	14	4	17.50	5
16	Bittergourd	17	2	21.25	2.50
17	Cowpea	49	16	61.25	20
18	Maize	36	16	45	20
19	Bean	4	1	5	1.25
20	Rajmah	4	2	5	2.50
21	Spine gourd	2	2	2.50	2.50
22	Lady’s Finger	11	5	13.75	6.25
23	Brinjal	57	28	71.25	35
24	Bird's eye chilli	63	35	78.75	43.75
25	Ginger	33	16	41.25	20
26	Yam	38	18	47.50	22.50
27	Cape yellowwood	2	2	2.50	2.50
28	Pumkin	49	21	61.25	26.25
29	Green chilli	20	6	25	7.5
30	Coco yam	5	5	6.25	6.25
31	Bamboo shoots	2	1	2.5	1.25

Source: *Field survey, 2016-17*

With regards to the market channel as shown in Table 5.29, large majority (88.75%) of them brought their crops from jhum to home the villagers would come and buy the crops at home itself. There were 7.50 percent respondents who sold

their crops directly from farm to Aizawl market while those who sold their crops in the local/village market accounted for 3.75 percent.

Table 5.29: Market channel

Sl. no	Market channel	Number	Percent
1	Farm to home	71	88.75
2	Farm to Aizawl market	6	7.50
3	Farm to local market	3	3.75
Total		**80**	**100**

Source: *Field survey, 2016-17*

5.3 Mandays Engaged in Shifting Cultivation

Shifting cultivation as already mentioned is labour intensive wherein the farming households have to put much labour in all stages of the jhum cycle. Attempt was also made to collect data on mandays involved in different stages of cultivation. The data on mandays engaged in jhum cultivation is presented in Table 5.30. Observation can be made from the Table that the overall mandays engaged in various stages of jhum cultivation on average was 192 mandays,

Table 5.30: Mandays engaged in shifting cultivation

(in Mandays)

Sl. no	Activity	South	West	East	Central	Overall
1	Cutting of forest	20.55	21.65	21.90	18.95	20.76
2	Marking of firelines	4.45	5.55	3.90	3.15	4.26
3	Burning	1.35	1	1	1.15	1.13
4	Reburning	10.20	10.75	13.85	8.60	10.85
5	Crossbar setting	2.45	0	0.75	2.55	1.44
6	Sowing	20.95	14.70	30.75	26.85	23.31
7	Weeding	92.9	65.45	80.75	80.60	79.93
8	Harvesting	55.45	36.55	42.80	68.65	50.86
Overall		**208.3**	**115.65**	**195.7**	**210.5**	**192.54**

Source: *Field survey, 2016-17*

Looking at the data on different activities, weeding required highest mandays with an average of 79 mandays followed by harvesting which required an average of

50.86 mandays and sowing with an average of 23.31 mandays while activity which required least mandays was burning with an average of 1.3 mandays. Saikia (1982) reported that in Kanther Terang village in Karbi Anglong district of Assam, 27 mandays per acre is required for felling trees and clearing jungle while the mandays required for clearing forest having an area of 1.94 acre in the present study is 20.76 mandays. Number of mandays involved in preparation of firelines on average was 4.26 while Mandays involved in re-burning on average was 10.85 mandays while the average mandays required for cross bar setting was 1.44 mandays (Table 5.30).

5.4 Hiring of Labour

Of all the activities in shifting cultivation, clearing forest is the most laborious task demanding manpower and able-bodied man. In the absence of male workers, the farming families have to hire labour or engaged relatives to accomplish the task.

The results presented in Table 5.31 reveal that 38.75 percent of the respondents engaged hired labours for clearing forest while 16.25 percent engaged hired labours for reburning. About one-third (33.75%) of the respondents engaged hired labours for weeding while 31.25 percent had to hire labours for harvesting the crops.

Table 5.31: Number of households hiring labour

Zone	Number			Percent		
	Yes	No	Total	Yes	No	Total
Cutting						
South	6	14	20	30	70	100
west	14	6	20	70	30	100
East	6	14	20	30	70	100
Central	5	15	20	25	75	100
Total	**31**	**49**	**80**	**38.75**	**61.25**	**100**

Table 5.31: Number of households hiring labour (Contd..)

Zone	Number			Percent		
	Yes	No	Total	Yes	No	Total
Re-burning						
South	-	20	20	-	100	100
west	7	13	20	35	65	100
East	4	16	20	20	80	100
Central	2	18	20	10	90	100
Total	**13**	**67**	**80**	**16.25**	**83.75**	**100**
Weeding						
South	6	14	20	30	70	100
west	14	6	20	70	30	100
East	5	15	20	25	75	100
Central	2	18	20	10	90	100
Total	**27**	**53**	**80**	**33.75**	**66.25**	**100**
Harvesting						
South	4	16	20	20	80	100
west	11	9	20	55	45	100
East	6	14	20	30	70	100
Central	4	16	20	20	80	100
Total	**25**	**55**	**80**	**31.25**	**68.75**	**100**

Source: *Field survey, 2016-17*

5.5 Other Livelihood Activities

The shifting cultivators have to rely mainly on agriculture for their livelihoods. They also have to take up other livelihood activities to supplement the family income to meet household requirements. The respondent households also had to take up other livelihood activities along with shifting cultivation as presented below.

5.5.1 Livestock Farming

It is common practice in Mizoram that almost every household in rural areas are engaged in livestock farming at least in a small scale to supplement family income or for household consumption. The results presented in Table 5.32 show that the respondents were also engaged in livestock rearing whereby majority (52.50%)

of them took up piggery while 43.80 percent of them took up poultry. Few respondents were also engaged in goat and cattle farming with 6.20 percent and 3.80 percent respectively.

Table 5.32: Livestock farming

Sl. no	Activities	Number	Percent
1	Piggery	42	52.50
2	Poultry	35	43.80
3	Goat farming	5	6.20
4	Cattle farming	3	3.80

Source: *Field survey, 2016-17*

5.5.2 Forest Resource Based Livelihoods

Forest resources are important source of rural livelihoods. The rural households along with shifting cultivation are usually engaged in forest resource-based livelihood activities periodically and seasonally. The activities usually include collection, processing/bundling and marketing of forest produces.

The forest-based livelihood activities in which the respondent households were involved are presented in Table 5.33. The activities under forest resource based livelihoods included collection/processing/marketing of Bamboo Shoots *(Rawtuai)* with 17.50 percent, Crabs *(Chakai)* with 11.20 percent, Broomsticks with 7.50, *Amomumdealbatum (Aidu)* with 5 percent, *Caryotaurens (Tum)* (3.80%), Wild Banana Blossom *(Tumbu)* with 3.60 percent, Rattan *(Hruipuizik)* with 2.50 percent, Seweg *(Telhawng)* with 2.50 percent, Freshwater Snail *(Chengkawl)* with 1.20 percent, Honey with 1.20 and Fishing with 1.20 percent.

Table 5.33: Forest resource-based livelihoods

Sl. no	Activities	Number	Percent
1	Collection of Bamboo Shoots *(Rawtuai)*	14	17.50
2	Collection of Crabs *(Chakai)*	9	11.20
3	Collection of Broomsticks	6	7.50
4	Collection of *Amomumdealbatum (Aidu)*	4	5
5	Collection of *Caryotaurens (Tum)*	3	3.80
6	Collection of Wild Banana Blossom *(Tumbu)*	3	3.80
7	Collection of Rattan *(Hruipuizik)*	2	2.50
8	Collection of Seweg (*Telhawng)*	2	2.50
9	Collection of Freshwater Snail (*Chengkawl)*	1	1.20
10	Collection of Honey	1	1.20
11	Fishing	1	1.20

Source: *Field survey, 2016-17*

5.5.3 Other Livelihoods Activities

The other livelihood activities in which the respondents were engaged in are presented further in Table 5.34. As seen in the Table, 6.20 percent of the respondents were in government service. It appears for this group of government employees that they took up shifting cultivation as a hobby and not as main source of livelihood to make use of their leisure times. Among the rest, 5 percent of them engaged in carpentry while 3.80 percent were engaged in petty shop and only 1 (1.20%) was engaged in fishery activities.

Table 5.34: Other livelihood activities

Sl. no	Activities	Number	Percent
1	Govt. service	5	6.20
2	Carpentry	4	5
3	Petty shop	3	3.80
4	Fishery	1	1.20

Source: *Field survey, 2016-17*

Chapter Summary

The livelihood activities under shifting cultivation were highlighted in the present chapter. The landholding in shifting cultivation were group into permanent land and jhum land. Shifting cultivation was practiced either in permanent land or jhum land but generally majorities of the respondents (46.25%) practiced shifting cultivation in both permanent and jhum land.

The average size of permanent land owned by the respondent households was 4.8acre with minimum of 1acre and maximum of 20acre. Majorities of the respondent's household (59.15%) belonged to a category who managed an area 'below 3 acres' of permanent land. The area of permanent land cultivated on average was 2.29 acre ranging from 1 acre to 12.5 acre. It was further noted that the size of land cultivated by highest number (31.25%) of respondents was 3 – 6 acres.

The average area of jhum cultivated by the respondents was 1.94 acre ranging from a minimum of 0.5 acre and a maximum of 5 acres. Moreover, the jhum area cultivated by highest number (38.75%) measured '1 – 2 acres' .

Variety of crops are cultivated in permanent land which include 1) Tree bean *(zawngtah)* (28.75%), 2) Orange *(serthlum)* (21.25%), 3) Banana *(balhla)* (20%), 4) Pineapple *(lakhuihthei)* (15%), 5) Broomstick *(hmunphian)* (13.75%), 6) Mango *(theihai)* (12.50%), 7) Climbing wattle *(khanghu)* (8.75%), 8) Lemon *(nimbu)* (8.75%), 9) Glorybower *(phuihnam)* (5%), 10) Snowflake *(kawhtebel)* (3.75%), 11) Mulberry *(theihmu)* (3.75%), 12) Passion fruit *(sapthei)* (3.75%), 13) Betel nut *(kuhva)* (2.50%), 14) Coffee (2.50%), 15) Jackfruit *(lamkhuang)* (2.50%), 16) Rubber (2.50%), 17) Teak (2.50%), 18) Peach *(theite)* (2.50%), 19) Tall tree *(thingthupui)* (2.50%), 20) Gooseberry *(sunhlu)* (1.25%), 21) Wild orange *(hatkora)*

(1.25%), 22) Papaya *(thingfanghma)* (1.25%), 23) Strawberry (1.25%), 24) Sugarcane *(fu)* (1.25%) and 25) Tamarind *(tengtere)* (1.25%).

The jhum crops cultivated by the respondent households include 1) Bird's eye chilli *(zo chilli)* (78.75%), 2) Rice *(buh)* (76.25%), 3) Brinjal *(bawkbawn)* (71.25%), 4) Cowpea *(behlawi)* (61.25%), 5) Pumkin *(mai)* (61.25%), 6) Bitter tomato *(samtawk)* (53.75%), 7) Yam *(bal)* (47.50%), 8) Maize *(vaimim)* (45%), 9) Ginger *(sawhthing)* (41.25%), 10) Sour tea *(anthur)* (33.75%), 11) Ash gourd *(maipawl)* (26.25%), 12) Cucumber *(fanghma)* (25%), 13) Green chilli *(hmarchapui)* (25%), 14) Sesamum *(chhawhchhi)* (22.50%), 15) Bittergourd *(changkha)* (21.25%), 16) Mustard *(antam)* (17.50%), 17) Lady's finger *(bawrhsaia be)* (13.75%), 18) Snakegourd *(berual)* (12.50%), 19) Summer mint *(lengser)* (7.50%), 20) Celery *(pardi)* (7.50%), 21) American basil *(runhmui)* (7.50%), 22) Toothache plant *(ankasa)* (6.25%), 23) Bean (5%), 24) Rajmah (5%), 25) Watermelon *(dawnfawh)* (5%), 26) Soyabean *(bekang)* (3.75%), 27) hyacinth bean *(bepui)* (3.75%), 28) Corriander *(dhania)* (3.75%), 29) Potato *(alu)* (3.75%), 30) Sweet potato *(kawlbahra)* (2.50%), 31) Cabbage *(zikhlum)* (2.50%) , 32) Cape yellowwood *(chingit)* (2.50%), 33) Mask melon *(hmazil)* (2.50%), 34) Spine gourd *(maitamtawk)* (2.50%), 35) Coco yam *(baibing)* (1.25%), 36) Pigeon pea *(behliang)* (1.25%), 37) Capsicum (1.25%), 38) Mulberry *(theihmu)* (1.25%) and 39) Tobacco *(vaihlo)* (1.25%).

The fallow period followed by the respondents on average was 9.16 years ranging from minimum of 3 years to maximum of 15 years. It was noted that more than half (52.5%) of the respondent's household followed 10-15 years of fallow period.

The data on allotment of jhum sites reveal that land allotment of jhum sites for 22.5 percent of the respondents was given in September which is followed by clearing forest/cutting trees performed in the month of January by majorities of the respondents (68.75%). The drying period on average was 64.25 days ranging from minimum of 30 days and maximum of 150 days. The duration of drying period was 30-60 days which was followed by majorities of the respondents with 42.5 percent. Burning of jhum plots mostly took place in the month of March (98.75%) and the duration of burning in most (67.50%) cases lasted for '1 – 2 hours' .

It was also identified that majority (77.50%) of the respondents performed three rounds of weeding in a year or one jhum cycle. The respondents performed their first round of weeding during April to June wherein half (50%) of them performed weeding in May. The second round of weeding was starting from May to August whereby most (51.25%) of them had to perform the weeding in July. In the third round of weeding, the highest number (45%) of respondents carried out in August. The fourth round of weeding was not required for most (83.75%) of the respondents while it was required only for lesser number (16.25%) of respondents. The respondents who performed their fourth round of weeding in October accounted for 7.50 percent.

Harvesting period starts initially from the month of May. The early crops such as brinjal and pumpkin are ready for harvest by May and crops like bitter tomato maize, sour tea, cowpea, bitter gourd are ready for harvest by June. The later crops like yam, bird's eye chilli, and green chilli are ready for harvest by July and August. Jhum rice is ready for harvest by October while ginger is ready for harvest by January of the succeeding year.

It was observed that rice was cultivated by 76.25 percent of the respondents and the quantity of rice sown on average was 2.16 tin out of which the quantity of harvest on average was 84.29 tin. The quantity of brinjal seed sown by 71.25 percent of the respondents on average was 312.5 gms from which they could harvested 83.52 kgs on average. Cowpea was cultivated by 61.25 percent respondents with average of 375 gms sown where they could harvest 62.85 bundles on average. The respondents who cultivated maize accounted for 45 percent. Out of the 15.44 cobs of maize sown they could harvest an average of 87.22 kgs of maize. Ginger was cultivated by 41.25 percent of the respondents. Out of the 302.90 kgs of ginger sown the harvest on average was 1450.60 kgs. A quarter (25%) of the respondents cultivated green chilli and they were able to harvest 55.50 kgs on average out of the 3.42 kgs of green chilli sown.

Majority (63.75%) of the respondents had to transport their crops by means of headload and there were some respondents who transported their crops by means of hired vehicles with 23.75 percent. The respondents who transported their crops by means of headload and hired vehicle accounted for 10 percent while the rest of only 2.50 percent transported their crops using private vehicle.

Large majority (82.50%) of the respondents transported directly from farm to home while few (11.25%) respondents transported first to roadside and then to home and the rest (6.25%) transported their crops directly market, mostly to Aizawl market.

The average distance covered by 69 (86.25%) respondents through headload was 3.75 kms with a range from 0.50 km to 14 kms. The data on distance covered by hired vehicle show that 21 (26.25%) respondents who had to transport their crops usually covered an average distance of 13.24 kms ranging from a minimum of 1 km

and a maximum of 60 kms. The average cost of hiring vehicle incurred one jhum cycle by respondents for transporting the crops on average was Rs 916.13 ranging from a minimum cost of Rs. 20/- and a maximum of Rs. 2,000 which shows wide variation in the cost of hiring vehicles.

The crops processed by comparatively larger number of respondents include cowpea leave (behlawi) (41.25%), bird's eye chilli (40%), sour tea (anthur) (31.25%), bitter tomato (17.70%), yam (leave) (17.70%) and brinjal (15%).

The crops marketed by comparatively larger number of the respondents include bird's eye chilli (43.75%), brinjal (35%), pumkin (26.25%), yam (leave) (22.50%), cow pea (20%), maize (20%), bitter tomato (17.50%) and sesamum (15%).

Large majority (88.75%) of the respondets brought their crops from jhum to home the villagers would come and buy the crops at home itself. There were 7.50 percent respondents who sold their crops directly from farm to Aizawl market while those who sold their crops in the local/village market accounted for 3.75 percent.

The overall mandays engaged in various stages of jhum cultivation on average was 192 mandays, Looking at the data on different activities, weeding required highest mandays with an average of 79 mandays followed by harvesting which required an average of 50.86 mandays and sowing with an average of 23.31 mandays while activity which required least mandays was burning with an average of 1.3 mandays.

It was noted that 38.75 percent of the respondents engaged hired labours for clearing forest while 16.25 percent engaged hired labours for reburning. About one-third (33.75%) of the respondents engaged hired labours for weeding while 31.25 percent had to hire labours for harvesting the crops.

Moreover, the respondents were also engaged in livestock rearing whereby majority (52.50%) of them took up piggery while 43.80 percent of them took up poultry. Few respondents were also engaged in goat and cattle farming with 6.20 percent and 3.80 percent respectively.

The activities under forest resource based livelihoods include collection/processing/marketing of Bamboo Shoots *(Rawtuai)* with 17.50 percent, Crabs *(Chakai)* with 11.20 percent, Broomsticks with 7.50, *Amomumdealbatum (Aidu)* with 5 percent, *Caryotaurens (Tum)* (3.80%), Wild Banana Blossom *(Tumbu)* with 3.60 percent, Rattan *(Hruipuizik)* with 2.50 percent, Seweg *(Telhawng)* with 2.50 percent, Freshwater Snail *(Chengkawl)* with 1.20 percent, Honey with 1.20 and Fishing with 1.20 percent.

It was further noted that 6.20 percent of the respondents were in government service. Among the rest, 5 percent of them engaged in carpentry while 3.80 percent were engaged in petty shop and only 1 (1.20%) was engaged in fishery activities.

CHAPTER – 6

GENDER ROLES IN SHIFTING CULTIVATION AND OTHER LIVELIHOOD ACTIVITIES

Swaminathan (1985) mentioned that women play crucial role in agricultural development including crop production, livestock production, horticulture, post-harvest operations, agro/social forestry, fishing etc. The nature and extent of women's involvement in agriculture vary greatly from region to region. Even within a region their involvement varies widely among different ecological sub-zones, farming systems, caste, classes and socio-economic status of families etc. The activities of shifting cultivation are performed manually; fertilizers, inorganic manure, machine, animal or ploughs are not employed for easy performance of the task as the method of farming is indigenous and traditional. The sequential and arduous activities in shifting cultivation demand effortful participation of the household members.

Role performed by gender in different activities of shifting cultivation varies depending on the family composition, size of the family, availability of work, traditions and practice. Gender roles in shifting cultivation are not specifically determined as division of labour in each household differs according to demand of work and availability of manpower in a family. As highlighted by Pachuau et al. (2015) in the writings on the social history of Mizoram, "the people of Mizoram practiced hill agriculture in most of the area which is also called 'Swidden cultivation,' where cultivated hill plots are cleared by firing and then hand-planted with mixed crops. Gender roles related to cultivation is also highlighted as the works of cultivation, harvesting and transporting crops was very demanding in which household members are involved, mostly and highly accomplished by women folk."

Bera (2012) also mentioned the genders involvement in Tripura among the Riang tribal community practicing shifting cultivation. "Plot are dried and set on fire in the month of March - April on which the task of burning plot is exclusively done by men folk while both men and women folk are participated at the time of harvesting." Aggarwal et al. (2013) mentioned the role of women in agriculture in Jammu state in which 20 – 70 percent of rural women are engaged in agricultural production and post-harvest activities. The main activities performed by women are transplantation, weeding, threshing, reaping, looking after the farm cattle and other livestock, collecting fodder, watering fruit plants, preparing and transporting manure and other inputs to the field. They are also engaged in constructing and repairing of irrigation channels and storage facilities.

Ralte (2015) also listed the roles performed by women folk in the farm. She narrates on the daily activities of women in shifting cultivation stating that women worked continuously the whole day on the farm and by afternoon break they collect vegetables and prepare noon meal. Though they have been exempted from burning the plot, they contribute helping in re-burning debris and sowing.

The present chapter deals with the gender roles in performing shifting cultivation and livelihood activities in Mizoram. The extent of gender involvement was measured in terms of their mean rating in a scale of 1 to 5 where 1 is lowest and 5 is highest. The mean rating of respondents was worked out to determine their level of involvement in each of the activities under shifting cultivation. The mean ratings were classified as follows: '4.51 – 5.00' High (H), '3.51 – 4.50' Moderately High (MH), '2.51 – 3.50' Moderate (M), '1.51 – 2.50' Moderately Low (ML) and '1.00 – 1.50' Low (L).

6.1 Gender Roles in Shifting Cultivation

As mentioned earlier the activities under shifting cultivation are broadly classified into 1) Site selection and land preparation, 2) Production, 3) Harvesting and 4) Post-harvest activities. The overall results of gender roles in various shifting cultivation activities are presented in Table 6.1. The involvement of males in activities under shifting cultivation as a whole was rated 'moderately high' while the involvement of females was rated 'moderate.' The results are indication that the involvement of males is higher over females in the overall shifting cultivation activities.

Table 6.1: Gender roles in shifting cultivation

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	Site selection and Land preparation	4.63	0.68	H	2.61	0.87	M
2	Production	3.13	1.12	M	3.13	0.97	M
3	Harvesting	3.23	1.04	M	2.93	1.03	M
4	Post-harvest	2.74	1.51	M	4.47	0.87	MH
	Overall	**3.72**	**1.09**	**MH**	**3.37**	**0.91**	**M**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

Looking into the results on various stages of shifting cultivation further reveal that the involvement of males was found to be higher in site selection and land preparation with a rating of 'high.' For production and harvesting activities, the level of involvement for males and females were found to be more or less same with the rating of 'moderate' while the involvement of females was found to be more in post-harvest activities with a rating of 'moderately high.' The data on gender roles in shifting

cultivation covering all the activities under various stages are presented in Appendix Table 6.1.

6.1.1 Site Selection and Land Preparation

The activities identified under site selection and land preparation included attend meeting for site allotment, site selection, marking jhum boundaries, clearing forest, preparation of firelines, burning, reburning, crossbar setting and construction of jhum hut. In all these activities, the involvement of males was found to be more with the ratings of 'high' and 'moderately high' (Table 6.2).

Table 6.2: Gender roles in site selection and land preparation

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	Attending meeting	4.96	0.24	H	2.6	0	M
2	Site selection	4.96	0.24	H	3	0.57	M
3	Marking boundaries	4.91	0.36	H	2.71	1.11	M
4	Clearing forest	4.8	0.66	H	2.1	0.56	ML
5	Making firelines	4.81	0.69	H	2.62	1.06	M
6	Burning	4.93	0.4	H	3.33	1.52	M
7	Reburning	4.11	1.13	MH	2.61	0.87	M
8	Crossbar setting	3.66	1.73	MH	2.44	0.88	ML
9	Construction of jhum hut	4.57	0.74	H	2.12	1.26	ML
Overall		**4.63**	**0.68**	**H**	**2.61**	**0.87**	**M**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

The zone-wise data on gender roles in site selection and land preparation as may be seen in Appendix Table 6.2 show similar trend where the involvement of males in all the zones was found to be more in activities such as attending meeting, site selection,

marking boundaries, clearing forest, making firelines, burning and construction of jhum house. Little variation was observed across the zones in reburning and crossbar setting activities. The level of involvement of males and females in reburning activities was found to be more or less equal for the respondents in east zone with 'moderate' and for the activities on crossbar setting, the level of involvement of males and females in south zone while no involvement of both males and females was observed in west zone which may be an indication that crossbar setting is usually not done in the west zone.

6.1.2 Gender Roles in Production Activities

The activities identified in the production stage include two main activities viz. sowing and weeding. Ogato (2009) in his study found out that female farmers contribute more than their male counterparts in production and crop management which is periodic and time consuming in shifting cultivation. The results of this study presented in Table 6.3 on the other hand reveal more or less same level of involvement for males and females in the production activities which include sowing and weeding with a rating of 'moderate.' The results indicate that both males and females are equally involved when it comes to production activities under the shifting cultivation.

Table 6.3: Gender roles in production activities

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	Sowing Seeds	2.95	1.22	M	3.36	0.98	M
2	Weeding	3.32	1.02	M	2.91	0.96	M
	Overall	**3.13**	**1.12**	**M**	**3.13**	**0.97**	**M**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

Only one variation was observed in the zone-wise data presented in Appendix Table 6.3 whereby the involvement of females in sowing was found to be of little more over males in the east zone with the ratings of 'moderate' and 'moderately low' respectively.

6.1.3 Gender Roles in Harvesting

The activities identified under harvesting included harvesting and transporting of crops in which it was found that the involvement of males and females in these activities are both with a rating of 'moderate' (Table 6.4). The results indicate that both males and females are equally involved in production activities under the shifting cultivation.

Table 6.4: Gender roles in harvesting

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	Harvesting	3.14	1.02	M	3.02	1.02	M
2	Transporting	3.32	1.07	M	2.84	1.04	M
	Overall	**3.23**	**1.04**	**M**	**2.93**	**1.03**	**M**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

The zone-wise date on gender roles in harvesting as presented in Appendix Table 6.4 shows similar trend for males and females involvement with a rating of 'moderate' in all the different zones.

6.1.4 Gender Roles in Post-harvest Activities

It was reported by Food and Agriculture Organization of the United Nations (2015) that indigenous women perform 70% of works related to shifting cultivation and

also engaged in activities on selection of seeds, weeding, gathering and selling. Men involved in selection of sites and hard physical work in land preparation. Women also helped in clearing land, preparation of firelines, and harvesting. Moreover, Chowdhury et.al (2009) also stated the involvement of women in post-harvest activities by stating that they are the key actors in farm activities especially in post-harvest operations, gardening and livestock farming. Contribution of female labour in different activities as well as in total family income was substantial which is particularly true for low income households.

A post-harvest activity is the off-farm activities in shifting cultivation as the activities are usually performed in the households. The harvested crops are preserved, processed or further sold in market. A post-harvest activity is the final activities of shifting cultivation which included processing/preserving of crops, preserving seeds, bundling and selling of crops.

Table 6.5: Gender roles in post-harvest activities

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	Processing/ Preserving of crops	2.46	1.50	ML	4.49	0.89	H
2	Preserving seeds	2.51	1.52	M	4.42	0.96	MH
3	Bundling for sale	2.96	1.42	M	4.42	0.86	MH
4	Selling in market	3.06	1.63	M	4.57	0.77	H
Overall		**2.74**	**1.51**	**M**	**4.47**	**0.87**	**MH**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

The involvement of females in these activities viz. processing/preserving of crops, preserving seeds, bundling and selling was found to be more with the ratings of

'high' and 'moderately high' (Table 6.5). The results indicate that males and females involvement was with the ratings of 'moderate' and 'moderately high' when it comes to post-harvest activities under the shifting cultivation.

The zone-wise data as presented in Appendix Table 6.5 shows more involvement of females over males with the ratings of 'high' and 'moderately high' for all activities in different zones except for bundling where males and females are equally involved in the east zone.

6.2 Gender Roles in Household Chores

As reported by International Labour Organisation (1975), the value of unpaid household work constitutes 25 – 39 percent of the total gross national product (GNP) in developing countries. Eckman et al. (2016) conveyed that decision on economics and marketing seem to be a shared task between male and female while it is evident from her study that marketing activities are clearly dominated by girls and women. In the present study, the household activities are basically classified into cooking, washing clothes, cleaning utensils, household cleaning, caring for children, vegetable shopping, household repairing works, collection of firewood, fetching water and financial management.

The overall results on gender roles in household chores is presented in Table 6.6. The gender involvement of male and female in household chores as presented in the Table indicated that females involvement was more than males in activities for cooking, washing clothes, cleaning utensils, household cleaning, caring for children, vegetable shopping and financial management with a rating of 'high' whereas there was equal participation of genders with a rating of 'moderate' for collection of firewood. There was variation of involvement of male and female for the activity of fetching water with

the ratings of ‘moderate’ and ‘moderately high’ respectively. Moreover, females are not involved in household repairing works. The involvement of males and females in household chores was with the ratings of ‘moderate’ and ‘moderately high’.

Table 6.6: Gender roles in household chores

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	Cooking	3	1.73	M	4.9	0.43	H
2	Washing clothes	3	1.63	M	4.88	0.61	H
3	Cleaning utensils	3.33	2.08	M	4.87	0.66	H
4	Household cleaning	3.25	2.06	M	4.97	0.15	H
5	Caring for children	2.33	2.3	ML	4.97	0.15	H
6	Vegetable shopping	3.5	1.36	M	4.74	0.68	H
7	Household repairing works	5	0	H	0	0	0
8	Collection of firewood	3.55	1.2	M	3.39	1.21	M
9	Fetching water	3.16	1.23	M	3.97	1.08	MH
10	Financial Management	4.36	1.11	MH	4.86	0.49	H
	Total	**3.44**	**1.47**	**M**	**4.15**	**0.54**	**MH**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

The zone-wise data on gender roles in household chores as may be seen in Appendix Table 6.6 reveals that females involvement was more than males in different zones for activities in cooking, washing clothes, cleaning utensils, household cleaning, caring for children and financial management with a rating of ‘high’. There was equal involvement of males and females for vegetable shopping and collection of firewood with a rating of ‘moderately high’ in west zone. There was more involvement of females in west, east and central for activity on fetching water with the rating of

'moderately high'. It is seen that females are not further involved in household repairing works in all different zones of south, west, east and central.

6.3 Gender Roles in Livestock Farming

Research studies on women's status in North Eastern India (2008) notified the activities performed by women in livestock farming and other livelihood activities that includes poultry, piggery, growing vegetables, collecting edible roots, fodder and firewood from forests, handloom weaving etc. They also sell products of such activities in order to earn money with which they purchase other requirements of the households. It was also identified in the present study that majorities of the households (52.5 %) engaged in livestock farming for secondary sources of income to sustain the livelihood of the family. It is noticed that the identified livestock farming includes piggery, poultry, goat farming and cattle farming.

The activities under livestock farming included – purchasing, house construction, collection of food/fodder, feeding and selling. The gender roles in livestock farming is highlighted in the following Table 6.7. It is seen that there was equal involvement of males and females for purchasing and selling with a rating of 'moderate' whereas it was 'moderately low' in males and 'moderate' in females for food/fodder collection and feeding, respectively. It was further identified that females involvement was not seen for house construction in livestock farming. The result determined that male and female involvement was with the ratings of 'moderate' and 'moderately low' for livestock farming activities.

Table.6.7: Gender roles in livestock farming

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	Purchasing	2.57	1.18	M	2.74	1.03	M
2	House construction	4.64	0.18	H	0	0	0
3	Food /fodder collection	2.4	1.52	ML	2.91	1.37	M
4	Feeding	2.26	1.67	ML	2.8	1.45	M
5	Selling	2.79	1.51	M	2.61	1.53	M
	Overall	**2.93**	**1.21**	**M**	**2.21**	**1.07**	**ML**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

As seen in Appendix Table 6.7, the zone-wise data shows that in the activity for purchasing, males involvement was more with a rating of 'moderate' in south while there was equal involvement of genders in east and central with the ratings of 'moderately low' and 'moderate' respectively. Males involvement was with a rating of 'high' for construction of house in different zones where females are not involved. Females involvement was greater for collection of food/fodder in all the zones with the ratings of 'moderately high' and 'moderate' except in south zone. Males involvement was more over females with a rating of 'moderate' in south and east for feeding and marketing. Further, equal involvement was observed in males and females for selling/marketing with a rating of 'moderate' in central zone.

6.4 Gender Roles in Forest resource-based livelihood activities

The shifting cultivators also occasionally engaged in forest resource-based livelihood activities by collecting non-timber produces from forest. The activities under

forest resource-based livelihoods mainly involved collection, processing/bundling and marketing of forest products. Varieties of forest products such as bamboo-shoots /rawtuai, crabs /chakai, broomstick/hmunphiah, amomumdealbatum /aidu, caryotaurens /tum, wild banana blossom /tumbu, rattan /hruipuizik, seweg /telhawng, freshwater snail /chengkawl and honey are collected, processed or sold in market and surpluses are consumed. The involvement of genders in collection, bundling and marketing of forest resources are listed in Table 6.8.

Table.6.8: Gender roles in forest resource-based livelihood activities

Sl. no	Zone	Male			Female		
		Mean	**Std. Dev**	**Description**	**Mean**	**Std. Dev**	**Description**
1	Collection	4.96	0.58	H	0	0	0
2	Bundling	1.58	0.38	ML	2.15	0.14	ML
3	Marketing	1.7	0.1	ML	3.3	0.11	M
	Overall	**2.74**	**0.35**	**M**	**1.81**	**0.08**	**ML**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

The involvement of males in collection of forest resources was with a rating of 'high' whereas it was 'moderately low' for bundling and marketing. Females involvement was with the ratings of 'moderately low' and 'moderate' for bundling and marketing respectively. The result on gender roles in forest resource-based livelihood activities indicate that males involvement was with a rating of 'moderate' and females with a rating of 'moderately low'.

As shown in Appendix Table 6.8, the zone-wise data indicate that the involvement of males for collection of forest resources was with the rating of 'high' in all different zones and the same case was observed for bundling in west. Females

involvement was found to be more for bundling in south and central with the ratings of 'high' and 'moderately high' respectively. Similarly, females involvement was more than males in the activity for marketing with the rating of 'high' in south and central. Equal involvement of males and females was observed for marketing with a rating of 'moderate'.

6.5 Gender Roles in Other Livelihood Activities

In order to supplement the family income, the households are engaged in other livelihood activities such as carpentry, petty shop and maintenance of fishpond which are identified among the shifting cultivators at the time of data collection. The involvement of gender in these activities are presented in the following Table 6.9.

Table 6.9: Gender roles in other livelihood activities

Activities	Male			Female		
	Mean	Std. Dev	Description	Mean	Std. Dev	Description
Carpentry	5	-	H	-	-	-
Petty shop	1.5	-	-	4	-	MH
Fishpond	5	-	H	-	-	-
Overall	**3.83**	**-**	**MH**	**1.33**	**-**	**L**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

The involvement of males for carpentry and maintenance of fishpond was with a rating of 'high' and on the contrary females involvement was not seen for these activities. In the activity for management of petty shop, females involvement was marked with a rating of 'moderately high'. The results indicate that males and females

involvement for other livelihood activities was with the ratings of 'moderately high' and 'low' respectively.

6.6 Roles Difference in Shifting Cultivation

Attempt was also made to examine whether there are significant differences in the level of involvement of males and females in shifting cultivation and other livelihood activities. To find out significant differences in gender roles, t-test statistical tool was applied in analysing the data. It may be noted that t-test was applied only for those values available for both genders. The t-test formula used was as follows:

$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{s^2\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}}$, where $\bar{x}_1$ and $\bar{x}_2$ are mean of male and female, respectively, and

$s^2 = \frac{1}{n_1+n_2}\left[\sum(x_{1i} - \bar{x}_1)^2 + \sum(x_{2j} - \bar{x}_2)^2\right]$ which follows students' t-distribution with $n_1 + n_2 - 2$ degrees of freedom.

The t-test results for gender roles in all activities under different stages of shifting cultivation are presented in Table 6.10. As may be seen in the Table, no significant difference was observed in gender roles if the overall results of shifting cultivation activities are taken as a whole. However, the data on individual activities show significant differences in gender roles particularly in activities related to site selection and land preparation activities and post-harvest activities. The level of involvement of males was higher in activities related to site selection and land preparation activities while the role of females was more in post-harvest activities.

Detail results of t-test for gender roles in individual activities under various stages of shifting cultivation may be seen in Appendix Table 6.9.

Table 6.10: t-test for gender roles in shifting cultivation activities

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	Site selection and land preparation	4.37	0.38	43.39	158	0.000
2	Production activities	2.89	2.82	0.36	158	0.718
3	Harvesting	3.02	2.68	1.79	158	0.074
4	Postharvest activities	1.08	3.92	-12.28	158	0.000
Overall		**2.8**	**2.35**	**18.94**	**158**	**0.252**

Source: *Field survey 2016-17*

6.6.1 Role Difference in Site Selection and Land Preparation

The results of t-test for gender roles in different activities under site selection and land preparation are presented in Table 6.11. The results shown in the Table reveal significant differences in the level of involvement of genders in site selection and land preparation activities whereby most of the activities under site selection and land preparation appeared to be more of the roles performed by males.

Table 6.11: t-test for gender roles in site selection and land preparation

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	Attend meeting for site allotment	4.96	0.10	75.68	158	0.000
2	Make decision in selecting sites	4.96	0.11	69.39	158	0.000
3	Marking of jhum boundaries	4.85	0.24	38.94	158	0.000
4	Clearing forest and cutting trees	4.80	0.33	35.87	158	0.000
5	Making firelines	4.81	0.26	36.98	158	0.000
6	Firing of jhum land	4.88	0.13	44.05	158	0.000
7	Refiring debris (Mangkhawh)	4.11	1.30	13.69	158	0.000
8	Cross bar setting (Changkham)	1.44	0.30	2.64	158	0.009
9	Construction of jhum hut (thlam)	4.53	0.66	22.90	158	0.000
Overall		**4.37**	**0.38**	**43.39**	**158**	**0.000**

Source: *Field survey 2016-17*

From the zone-wise data shown in Appendix Table 6.10, slight variation could be observed in gender roles across the different zones though there were no significant differences. It could be observed that few women in west and central zones were

involved in attending meeting for site selection. Involvement of few women was also observed and all belonged to west zone. The women found involved in marking of jhum boundaries, clearing forests, making firelines and firing jhum land belonged to west and east zones. Women involvements in activities like refiring, crossbar setting and construction of jhum hut were also observed across all zones.

6.6.2 Role Difference in Production Activities

The role identified under the production activities include sowing of seeds and weeding. The t-test results presented in Table 6.12 show no significant difference in the level of involvement of males and females in sowing and weeding activities.

Table 6.12: t-test for gender roles in production activities

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	Sowing seeds	2.74	2.99	-1.12	158	0.266
2	Weeding	3.05	2.66	1.95	158	0.053
	Overall	**2.89**	**2.82**	**0.36**	**158**	**0.718**

Source: *Field survey 2016-17*

The zone-wise data as may be seen in Appendix Table 6.11 also show no significant difference of gender involvement across all zones in activities such as sowing of seeds and weeding.

6.6.3 Role Difference in Harvesting Activities

The role identified under harvesting activities includes harvesting and transporting of crops. It was observed from the t-test Table 6.13 that no significant result in the level of involvement of gender was shown for these activities.

The zone-wise data as may be presented in Appendix Table 6.12 also reveals that that was no significant results of genders involvement for harvesting activities in all different zone of south, west, east and central.

Table 6.13: t-test for gender roles in harvesting activities

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	Harvesting of crops	2.95	2.81	0.70	158	0.485
2	Transporting of crops	3.10	2.56	2.59	158	0.011
Overall		**3.02**	**2.68**	**1.79**	**158**	**0.074**

Source: *Field survey 2016-17*

6.6.4 Role Difference in Post-harvest Activities

The post-harvest activities include processing/preserving crops, preserving seeds, bundling and selling. The t-test results presented in Table 6.14 shows significant difference at all levels of males and females involvement for post-harvest activities. The result indicates that the overall involvement of females in post-harvest activities are more over males.

Table 6.14: t-test for gender roles in post-harvest activities

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	Processing/ Preserving of crops	0.92	3.99	-12.23	158	0.000
2	Preserving seeds	1.04	3.92	-11.22	158	0.000
3	Bundling for sale	1.19	3.81	-9.64	158	0.000
4	Selling in market	1.15	3.95	-10.02	158	0.000
Overall		**1.08**	**3.92**	**-12.28**	**158**	**0.000**

Source: *Field survey 2016-17*

The zone-wise data as seen in Appendix Table 6.13 also show significant result for all the activities under post-harvest in which females involvement level was significantly greater than males in all different zone.

6.7 Role Difference in Household Chores

The t-test result for gender roles in household chores as highlighted in Table 6.15 indicate that there was significant difference in the level of involvement in all activities except for collection of firewood. It was observed from the Table that females are not

involved in household repairing works. Hence, the t-statistic is not calculated for the parameters in which values are not available for both genders.

Table 6.15: t-test for gender roles in household chores

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	Cooking	0.26	4.84	-34.01	158	0.000
2	Washing clothes	0.15	4.89	-44.33	158	0.000
3	Cleaning utensils	0.12	4.88	-43.46	158	0.000
4	Household cleaning	0.16	4.91	-42.41	158	0.000
5	Caring for children	0.09	4.91	-52.80	158	0.000
6	Vegetable shopping	0.70	4.39	-15.81	158	0.000
7	Household repairing works	5.00	0.00	-	-	-
8	Collection of firewood	2.80	2.68	0.44	158	0.659
9	Collecting/Fetching water	1.98	3.39	-4.96	158	0.000
10	Financial Management	1.04	4.01	-9.75	158	0.000
	Overall	**1.23**	**3.89**	**-28.44**	**158**	**0.000**

Source: *Field survey 2016-17*

The involvement level of females are more than males for most of the activities in household chores. The zone-wise data as may be seen in Appendix Table 6.14 also indicate significant difference of gender involvement across all zones in activities such as cooking, washing clothes, cleaning utensils, household cleaning, caring for children, vegetable shopping, collection/fetching water and financial management. The involvement of females in these activities were more than males across all zones.

6.8 Role Difference in Livestock Farming

The role identified under livestock farming activities include purchasing, animal house construction, food/fodder collection, feeding and marketing. The t-test results presented in Table 6.16 show insignificant difference in the level of involvement of males and females for livestock farming activities.

From the zone-wise data shown in Appendix Table 6.15, it is further seen that t-test was not significant in the level of involvement of males and female for all

activities such as purchasing, animal house construction, food/fodder collection, feeding and marketing across the zones.

Table 6.16: t-test for gender roles in livestock farming

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	Purchasing	1.23	1.31	-0.39	158	0.694
2	House construction	2.42	0	10.02	158	0.000
3	Food/fodder collection	1.32	1.51	-2.38	158	0.019
4	Feeding	0.53	0.83	-2.38	158	0.019
5	Marketing	0.72	0.89	-0.30	158	0.766
	Overall	**1.24**	**0.9**	**2.22**	**158**	**0.028**

Source: *Field survey 2016-17*

6.9 Role Difference in Forest resource-based livelihood activities

The activities included in forest resource-based livelihood are collection, bundling and marketing. As presented in Table 6.17, t-test result was not significant in the involvement of males and females for forest resource-based livelihood activities.

Table 6:17: t-test for gender roles in forest resource-based livelihood activities

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	Collection	0.26	0.01	3.42	158	0.001
2	Bundling	0.11	0.26	-1.09	158	0.277
3	Marketing	0.02	0.07	-2.12	158	0.036
	Overall	**0.13**	**0.14**	**0.19**	**158**	**0.853**

Source: *Field survey 2016-17*

6.10 Role Difference in Other Livelihood Activities

The other livelihood activities identify included carpentry, petty shop and maintenance of fishpond. The t-test result as presented in Table 6.18 show insignificant difference of gender involvement for other livelihood activities.

Table 6.18: t-test for gender roles in other livelihood activities

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	Carpentry	0.18	0	1.75	158	0.081
2	Petty shop	0.03	0.16	-1.23	158	0.222
3	Fishpond	0.06	0	1.00	158	0.319
Overall		**0.09**	**0.05**	**0.79**	**158**	**0.432**

Source: *Field survey 2016-17*

6.11 Constraints Faced by Gender

One of the objectives of the study is to identify constraints facing gender in performing the livelihood activities. Thus, attempt was made to identify the constraints faced by gender in performing the livelihood activities. The constraints facing gender in performing livelihood activities under the shifting cultivation system include the following:

1) Shifting cultivation is labour intensive which requires so much time and energy. Both gender face various constraints in performing the livelihood activities under shifting cultivation as it demands much physical inputs every year. However, in such situation where no other alternative means of livelihood is available, the rural households have no other option but continue with shifting cultivation. So, the rural households regardless of gender will continue to face constraints in performing their livelihoods under shifting cultivation system till such time better and more sustainable way of hill agriculture is found out.
2) The low level of participation of female respondents in decision making – particularly in attending meeting for site selection – is an indication that males are considered to play more roles when it comes to decision making even among

the shifting cultivators. So, this still remains as a constraint for gender equality in decision making.

3) Lack of or poor road connectivity to jhum lands was another constraint faced by the shifting cultivators. The jhum produces have to be transported by means of headload covering long distance i.e. an average of about 3.75 kms. While poor connectivity is a constraint for both genders, it is even more for women as head loading requires more physically inputs.
4) While the important roles played by women could be observed in post-harvest activities such as processing/preserving of crops, preserving seeds, bundling and selling, the women are performing these activities with their limited knowledge and skills. So, enhancing the capacity of women and imparting appropriate skills particularly in post-harvest management will give more livelihood opportunities for women engaged in shifting cultivation.
5) Based on the overall findings of the study, the contribution of women in terms of their participation in shifting cultivation activities is found to be significant. At the same time, women are over burdened with other livelihood activities and household chores. With all the energy required and the time constraints in trying to meet all family needs, it is not impossible that the mothers' health may be adversely affected and child care support may often be neglected.

Chapter Summary

The analysis of male and female involvement in shifting cultivation and other livelihood activities is presented in this chapter. In order to identify the role difference of gender, t-test was also conducted for the study.

The involvement of males in activities under shifting cultivation as a whole was rated ‘moderately high’ while the involvement of females was rated ‘moderate’ which indicate that the involvement of males was higher over females in the overall shifting cultivation activities. The involvement of males was found to be more with the ratings of ‘high’ and ‘moderately high’ for site selection and land preparation. The level of involvement for males and females in production and harvesting activities are with a rating of ‘moderate’. Moreover, male’s and female’s involvement were with the ratings of ‘moderate’ and ‘moderately high’ when it comes to post-harvest activities under the shifting cultivation.

The involvement of males and females in household chores was with the ratings of ‘moderate’ and ‘moderately high’. It was identified that majorities of the households (52.5 %) engaged in livestock farming in which male and female involvement was with the ratings of ‘moderate’ and ‘moderately low’ respectively. The result on gender roles in forest resource-based livelihood activities indicate that male’s involvement was with a rating of ‘moderate’ and females with a rating of ‘moderately low.’ It was also further determined that the households are also engaged in other livelihood activities such as carpentry, petty shop and maintenance of fishpond in which the involvement of males and females was with the ratings of ‘moderately high’ and ‘low’ respectively.

In the test for difference of means, significant difference on average performances of male and female was observed for site selection and land preparation. The t-statistic was significant at all level for the various classification of attending meeting, selecting sites, marking jhum boundaries, clearing forest, preparation of firelines, firing, refiring and construction of jhum hut. It was observed that t-test was

significant at all levels for post-harvest activities on shifting cultivation such as processing/preserving crops, preserving seeds, bundling and selling/marketing.

The t-test show significant difference on the overall average involvement of male and female in household activities. Moreover, significant differences at all level was observed in the activities for cooking, washing clothes, cleaning utensils, household cleaning, caring for children, vegetable shopping, fetching water and financial management. show insignificant difference in the level of involvement of males and females for livestock farming activities. Moreover, the t-test result was not significant in the involvement of males and females for forest resource-based livelihood activities and also for other livelihood activities such as carpentry, petty shop and management of fishpond.

The constraints faced by genders in performing the livelihood activities under shifting cultivation include i) labour intensiveness, ii) participation in decision making, iii) lack or poor farm connectivity, iv) capacity building and skill development, and v) overburdening of women with other livelihood activities and household chores.

CHAPTER – 7

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The final chapter presents the summary, conclusions and recommendations based on the findings presented in the previous chapters.

7.1 Summary

The study on "Gender Roles in Livelihood Activities Under Shifting Cultivation System in Mizoram" was undertaken in Mizoram covering a total of sixteen villages in four districts viz. Siaha, Mamit, Champhai and Aizawl. A total of 80 households practicing jhum cultivation were identified as sample of the study. From every sample household one male and female each were interviewed to make a total of 160 respondents. Primary sources of information related to socio-economic profile of the respondents, shifting cultivation, livelihood activities and gender roles were gathered through interview schedule purposively designed for the study by the researcher. Secondary data were also collected various sources such as reports, documents, books and internet.

7.1.1 Socio-Economic Profile

The informants of the households were 63.75 percent male and 36.25 percent female. The mean age of the respondents was 48.75 years. Majority of the respondents completed middle school level of education. The average number of the respondent's family members were 6.01. Majority of the respondent households belonged to Priority Households (PHH).

The households' average monthly expenditure was Rs 6,306.25. The monthly expenditure on food/consumable item was 60-80 percent out of the total expenditure. The average annual income of the household was Rs 65943.75/-. The average annual

income on agriculture sources was Rs 31400/-. The respondent's households experienced shifting cultivation for 30-40 years.

7.1.2 Livelihood activities under shifting cultivation

It was observed that large number (46.25%) of the respondents managed both permanent and jhum land. Moreover, one-third (32.50%) of the households owned permanent land while 21.25 percent households managed jhum plots allotted by the VCs.

The average size of permanent lands owned by the respondent households was 4.88 acre and the area of permanent land cultivated on average was 2.29 acre. The average area of jhum land cultivated by the respondents was 1.94 acre.

Varieties of crops were cultivated in permanent land which include tree bean *(zawngtah)* (28.75%), orange (21.25%), banana (20%), pineapple (15%), broomstick (13.75%), mango (12.50%), climbing wattle *(khanghu)* (8.75%), lemon (8.75%), glorybower *(phuihnam)* (5%), snowflake *(kawhtebel)* (3.75%), mulberry *(theihmu)* (3.75%), passion fruit (3.75%), betel nut (2.50%), coffee (2.50%), jackfruit (2.50%), rubber (2.50%), teak (2.50%), peach *(theite)* (2.50%), tall tree *(thingthupui)* (2.50%), gooseberry (1.25%), wild orange *(hatkora)* (1.25%), papaya (1.25%), strawberry (1.25%), sugarcane (1.25%) and tamarind (1.25%).

The crops cultivated in jhum land were Mizo chilli/bird's eye chilli (78.75%), rice (76.25%), brinjal (71.25%), cowpea (61.25%), pumkin (61.25%), bitter tomato *(samtawk)* (53.75%), yam (47.50%), maize (45%), ginger (41.25%), sour tea *(anthur)* (33.75%), ash gourd *(maipawl)* (26.25%), cucumber (25%), green chilli (25%), sesamum (22.50%), bittergourd (21.25%), mustard (17.50%), lady's finger (13.75%), snakegourd (12.50%), summer mint *(lengser)* (7.50%), celery *(pardi)* (7.50%), American basil *(runhmui)* (7.50%), toothache plant *(ankasa)* (6.25%), bean (5%),

rajmah (5%), watermelon (5%), soyabean *(bekang)* (3.75%), hyacinth bean *(bepui)* (3.75%), coriander *(dhania)* (3.75%), potato (3.75%) , sweet potato (2.50%), cabbage (2.50%), cape yellowwood *(chingit)* (2.50%) , mash melon (hmazil) (2.50%), spine gourd (maitamtawk) (2.50%), coco yam *(baibing)* (1.25%), pigeon pea *(behliang)* (1.25%), capsicum (1.25%), mulberry (1.25%) and tobacco plant *(vaihlo)* (1.25%).

The average fallow period followed by the respondents was 9.16 years ranging from minimum of 3 years to maximum of 15 years. The first and foremost activity in shifting cultivation i.e. allotment of jhum site was normally made in September which is followed by clearing/cutting forest performed in January by majority of the respondent's household. The drying period on average was 64.25 days ranging from a minimum of 30 days and a maximum of 150 days. Burning of jhum plots usually take place in March by majorities of the household and duration of burning in most cases lasted for '1 – 2 hours.'

Sowing seeds initially starts soon after burning. It was identified that bird's eye chilli, rice, brinjal, cowpea leaves, bitter tomato, yam, maize, ginger and green chilli are the major crops cultivated in jhum plot. The early crops such as brinjal and pumpkin are ready for harvest by May while bitter tomato, maize, sour tea, cowpea and bitter gourd are ready for harvest by June. The later crops like yam, bird's eye chilli and green chilli are ready for harvest by July – August. Jhum rice is ready for harvest by October while ginger is ready for harvest in January of the succeeding year.

It was recorded that the quantity of bird eye chilli sown by 78.75 percent of the respondents on average was 2 kgs out of which they could harvest an average of 84.48 kgs. Rice was cultivated by 76.25 percent of the respondents and the quantity of rice sown on average was 2.16 tin out of which the quantity of harvest on average was 84.29 tin. The quantity of brinjal seed sown by 71.25 percent of the respondents

on average was 312.50 gms from which they could harvested 83.52 kgs on average. Cowpea was cultivated by 61.25 percent respondents with average of 375 gms sown where they could harvest 62.85 bundles on average. Bitter tomato *(samtawk)* was cultivated by 53.75 percent of the household. While quantity of bitter tomato sown on average was 250 gms and the quantity of harvest on average was 41.62 kgs. The respondents who cultivated yam accounted for 47.5 percent. From the average quantity of 15.44 kgs of yam sown the quantity of harvest on average was 117.10 kgs. The respondents who cultivated maize accounted for 45 percent. Out of the 15.44 cobs of maize sown they could harvest an average of 87.22 kgs of maize. Ginger was cultivated by 41.25 percent of the respondents. Out of the 302.90 kgs of ginger sown the harvest on average was 1450.60 kgs. A quarter (25%) of the respondents cultivated green chilli and they were able to harvest 55.50 kgs on average out of the 3.42 kgs of green chilli sown.

Normally three rounds of weeding are performed in a year or one jhum cycle which initially starts in April till the end of November. Half of the respondents performed the first round of weeding in May and the second round of weeding was performed in July. The third round of weeding was carried out in August and a greater number of the respondents performed their fourth round of wedding in October.

Majority of the respondents had to transport their crops by means of headload and there were few respondents who transported their crops by means of hired vehicles. Minimal number of respondents also transported their crops using private vehicle. It was also further recorded that large majority of the respondents transported crops directly from farm to home while few respondents transported first to roadside and then to home and the rest transported their crops directly to market, mostly to Aizawl market. The average distance covered by respondents through headload was

3.75 kms while distance covered by hired vehicles on average distance was13.24 kms. The cost of hiring vehicles in most cases is usually done on shared basis. The average cost of hiring vehicle by respondents for transporting the crops on average was Rs 916.13.

The major jhum crops processed by the respondents include cow pea leave (behlawi) (41.25%), bird's eye chilli (40%), sour tea (anthur) (31.25%), bitter tomato (17.70%), yam (leave) (17.70%) and brinjal (15%). The respondents also sold varieties of jhum crops in markets. The crops sold by comparatively larger number of respondents include bird's eye chilli (43.75%), brinjal (35%), pumkin (26.25%), yam (leave) (22.50%), cow pea (20%), maize (20%), bitter tomato (17.50%) and sesamum (15%).

Large number of respondents brought their crops from jhum to home and the villagers would come and buy the crops at home itself. There were few respondents who sold their crops directly from farm to Aizawl market while minimal number of respondents also sold their crops in the local/village market.

It was observed that the overall mandays engaged in various stages of jhum cultivation on average was 192 mandays. Weeding required highest mandays with an average of 79 mandays while activity which required least mandays was burning with an average of 1.3 mandays.

The results further reveal that 38.75 percent of the respondents had engaged hired labours for clearing forest while 16.25 percent engaged hired labours for reburning. Aabout one-third (33.75%) of the respondents reported to engage hired labours for weeding while 31.25 percent reported to hire labours for harvesting the crops.

The respondents also reported to engage in livestock rearing whereby majority of them took up piggery and poultry. Few respondents were also engaged in goat and cattle farming.

The number of households engaged in forest resource-based livelihoods included collection/processing/marketing of bamboo shoots *(rawtuai)*, crabs *(chakai)*, roomsticks, *Amomumdealbatum (aidu)*, C*aryotaurens (tum)*, wild banana lossom *(tumbu)*, rattan *(hruipuizik)*, seweg *(telhawng)*, freshwater snail *(chengkawl)*, honey and fishing. Few respondents were in carpentry, petty shop and in fishery activities.

7.1.3 Gender roles in shifting cultivation and other livelihood activities

The activities under shifting cultivation are broadly classified into 1) Site selection and land preparation, 2) Production, 3) Harvesting and 4) Post-harvest activities. The involvement of males in the overall activities under shifting cultivation was a little higher over that of females. In the activities related to site selection and land preparation, the involvement of males was found to be higher than females.

The level of involvement of both males and females in production activities was found to be more or less similar with a rating of 'moderate.' Similar level of involvement for males and females could be observed in harvesting activities. On the other hand, the level of involvement of females was found to be more in post-harvest activities.

The overall involvement of females in household chores was found to be higher than that of males. The level of involvement of females was even higher in activities such as cooking, washing, cleaning utensils, household cleaning, caring for children, vegetable shopping. On the other hand, household repairing works are mainly done by males. The level of involvement in case firewood collection for males

and females was more or less the same while the involvement of females was found a little higher in fetching water and financial management.

Majority of the respondents were engaged in livestock farming to supplement the family income. The livestock include piggery, poultry, goat farming and cattle farming. The involvement of males in the overall livestock farming activities was found to be a little higher while construction of animal house was performed mainly by males. The level of involvement was found to be more or less same for both genders in activities related to purchasing and selling while the level of involvement of females was found to be a little higher in activities related to food/fodder collection and feeding.

The activities under forest resource-based livelihoods involved collection, processing/bundling and marketing of forest products. Varieties of forest products such as bamboo-shoots *(rawtuai)*, crabs *(chakai)*, broomstick *(hmunphiah)*, amomumdealbatum *(aidu)*, caryotaurens *(tum)*, wild banana blossom *(tumbu)*, rattan *(hruipuizik)*, seweg *(telhawng)*, freshwater snail *(chengkawl)* and honey are collected, processed or sold in market and surpluses are consumed.

The overall results in forest resource-based livelihood activities reveal that the involvement of males was little higher over females. Collection of forest-resources was found to be mainly the task of males. The level of involvement in bundling was more or less equal for both genders while the level involvement of females was found to be little higher in marketing.

Other livelihood activities identified were carpentry, petty shop and fishpond. Carpentry and fishery activities were mostly taken up by males while the petty shops were mainly managed by females.

The t-test results on the level of involvement in shifting cultivation and other livelihood activities further reveal that significant differences across gender could be observed in activities related to site selection and land preparation, post-harvest and household chores. While more of males' involvement was observed in site selection and land preparation, the level of involvement was found to be higher for females in post-harvest activities and household chores.

7.2 Conclusions

Based on the findings of the study, conclusions are drawn and presented as below:

7.2.1 Socio-Economic Profile

The respondents were of middle age with an average of 47 years and the highest number of them belonged to the age group of 40 – 50 years. The results on educational qualification, the highest number of respondents completed middle school while as many as 16.25 percent were still illiterate. On the other hand, the respondents have an average 6 members in the family.

Family status of the respondents was categorized in terms of ration cards held by them viz. AAY, PHH and APL. Most of the respondents belonged to the PHH category.

The respondent annual income on average was Rs. 65,943.80/- and the annual income on agriculture on average was Rs. 31,400/-. Moreover, the monthly expenditure of respondent households on average was Rs. 6,306.25/- while the monthly expenditure of respondents on food items on average was Rs. 3,271.25. The respondents on average had 21.57 years of experience in shifting cultivation.

7.2.2 Livelihood Activities under Shifting Cultivation

The landholding in shifting cultivation is group into permanent land and jhum land. Nearly half of the respondents managed both permanent and jhum lands. There were also numbers of households who managed shifting cultivation in their permanent land and jhum plot allotted by the VCs. The average size of permanent lands owned by the respondent households was 4.88 acre and the area of permanent land cultivated on average was 2.29 acre while the average area of jhum cultivated by the respondents was 1.94 acre.

There were as many as twenty-five crops cultivated in permanent land which were cash crops, horticulture crops and indigenous crops while there were as many as thirty-nine crops cultivated in jhum land. The fallow period followed by the respondents on average was 9.16 years and majority (52.5%) of the respondents followed '10 - 15 years' of fallow period.

The foremost activity on shifting cultivation is allotment of jhum sites was usually performed in the month of September to November which is followed by demarcation of individual plot performed soon after jhum sites are selected. Clearing the forest was performed from November till the month of January and the plot is left for drying on average of 64.25 days. Firelines are prepared prior to burning and burning of jhum plot is completed before 15th of March or not later, depending on local weather condition. Normally, the duration of burning lasted for 1 – 2 hours. Refiring is usually done on the following days of burning and cross bar setting are prepared for the prevention of soil erosion at the time of refiring according to the condition of the slope. Mixed cropping is commonly practice in shifting cultivation and the cultivators started sowing soon after burning. Bird's eye chilli, rice, brinjal, cowpea, bitter tomato, yam, maize, ginger and green chilli are the major crops cultivated by the

respondents. Normally, three rounds of weeding are performed in one jhum cycle wherein majority of the respondents performed their first round of weeding in May. The second round of weeding was performed in July by majority of the cultivators while the third round of weeding was carried out in August by numbers of respondents. Harvesting period starts from the month of May. Early crops sown soon after burning i.e. March are ready for harvest as early as May.

Majority of the respondent households transport their crops by means of headload directly from farm to home and the average distance covered through headload was 3.75 kms. On the contrary, the respondents who transport their crops usually covered an average distance of 13.24 kms and the average cost of hiring vehicle incurred one jhum cycle for transporting the crops on average was Rs 916.13.

Harvested crops are freshly consumed or processed in the form of sundried, smoke dried or fermented. Varieties of seeds are saved for the upcoming years. There were as many as seventeen crops which were processed in different forms which include cowpea leave, bird's eye chilli, sour tea, bitter tomato, yam (leave), brinjal etc. The respondents listed a total of thirty-one crops which were sold by them in varied quantity. Among these, the crops marketed by comparatively larger number of the respondents include bird's eye chilli, brinjal, pumpkin, yam (leave) (22.50%), cowpea, maize, bitter tomato and sesamum. Large majority of the respondent brought their crops from jhum to home and the villagers would come and buy the crops at home itself.

The overall mandays engaged in various stages of jhum cultivation on average was 192 mandays while weeding required highest mandays with an average of 79 mandays and burning required least mandays with an average of 1.3 mandays. The

hired labour engaged by the respondent households were highest for the activity on clearing forest while reburning requires the least number of hired labour.

7.2.3 Other Livelihood Activities

The respondent households also take up other livelihood activities along with shifting cultivation which are livestock farming, collection of forest resources and other livelihood activities such as carpentry, petty shop and management of fishpond. The respondents were engaged in livestock rearing whereby majority of them took up piggery while lesser number of the took up poultry and few respondents were engaged in goat and cattle farming. There are total of eleven items of forest resources which were collected by the respondents which are Bamboo Shoots *(Rawtuai)*, Crabs *(Chakai)*, Broomsticks, *Amomumdealbatum (Aidu)*, *Caryotaurens (Tum)*, Wild Banana Blossom *(Tumbu)*, Rattan *(Hruipuizik)*, Seweg *(Telhawng)*, Freshwater Snail *(Chengkawl)*, Honey and Fish.

7.2.3 Gender Roles

There was higher involvement of males than females in the overall shifting cultivation activities, site selection and land preparation, livestock farming, forest resources-based livelihood and other livelihood activities. There was more or less equal involvement of males and females in production activities and harvesting. More involvements of females were observed in post-harvest activities and household chores.

Further, t-test results reveal significant differences with regards to the level of involvement in activities such as site selection and land preparation where males respondents played more roles while involvement of females was significantly higher in post-harvest activities and household chores.

7.3 Recommendations

Based on the findings and conclusions, the following recommendations are offered:

1) Shifting cultivation is labour intensive, systematic, traditional and periodic. Shifting cultivation on the other hand is said to have adversely effect on the environment as it deteriorates the ecological balance of nature and pollutes the environment. However, it is still practiced by the indigenous communities as there is no other option for better livelihoods. The lack for alternative livelihood activities compelled the rural farmers in Mizoram to pursue shifting cultivation despite the claimed unfavourable impact on the environment. Hence, the need for improving the practice of shifting cultivation by introducing sustainable method of farming through cooperating the traditional and modern techniques of cultivation without deteriorating the ecological balance of nature is the need of an hour. Therefore, increase in production and improve in quality should be the primary focus on the technique since economically backward households i.e. Priority Households (PHH) comprised of the highest number of percentages among the respondent's households who solely depends on cultivation for their subsistence.
2) The number of households engaged in livestock farming particularly in piggery and poultry accounts for the highest percentage among the respondents. Therefore, promotion of livestock farming among the shifting cultivators will further enhance the livelihood security of the rural households practicing shifting cultivation. The respondents were also engaged in forest resources-based livelihood activities by collecting non timber produces. Policy measures for sustainable way of forest resources management with

active participation of communities are recommended to ensure sustainable forest resource-based livelihoods for the rural households.

3) In the course of interaction with the respondents during field investigation, wage employment programme particularly of Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) was found to be one major source of household income for the shifting cultivators during the lean period. More of such wage employment schemes may be introduced along with other development programmes in rural areas for the enhancement of rural livelihoods.
4) With regards to the data on market channel it was observed that large majority of the respondents brought their crops from jhum to home where the villagers would come and buy the crops. There were also respondents who took their crops directly from farm to urban and local/village markets whereby each of them would find their own way of marketing the jhum crops. It is desirable that the shifting cultivators are properly organized in their respective villages so that they can have proper market channels with technical guidance from government departments and other development institutions. This will enhance the livelihoods of shifting cultivators and prevent them from unnecessary intervention of middle and price fluctuation
5) Observation was also made during the study that there are some who practiced permanent farming along with shifting cultivation. Such permanent farming practice may be encouraged with supports in terms good quality cash crops, horticulture crops as well as indigenous crops having good market potential.
6) Most respondents had to transport their crops by means of headloads directly from farm to home covering an average distance of 3.75 km and by hired

vehicles covering an average distance of 13.24 km. Because of lack of or poor road connectivity, the shifting cultivators have to put much of their times, energy and money. It even causes more hardship to women farmers. This calls for better road connectivity as utmost importance in enhancing the livelihoods of shifting cultivators. Better road and transportation facilities connecting jhum lands will surely enhance the livelihoods of shifting cultivators.

7) With regards to the data on educational qualification of the respondents, there were few among the respondents still illiterate despite the advancement of time and technology. This issue on literacy in rural areas needs a relook so that appropriate measures are taken to improve the overall quality of life among the rural farmers through education.

8) The involvement of women could be observed in all the stages of shifting cultivation starting from site selection and land preparation to post-harvest. Their level of involvement in post-harvest activities was even significantly higher over that of men. Hence, the contribution of women in shifting cultivation in the context of Mizoram is worth noting. However, the level of involvement of males was higher in activities related to decision-making, particularly in site selection and land preparation. This calls for policy measures to relook into the welfare of women particularly with focus to recognition of their contributions towards household economy, enhancement of knowledge and skills, and overall empowerment so they can actively participate in decision making process which will eventually bring quality of life among women.

9) The study on ‘Gender Roles in Livelihood Activities under Shifting Cultivation System in Mizoram’ focused on limited aspects of gender roles. Further studies on gender roles covering different aspects in the context of Mizoram are recommended. The suggested studies may include gender roles in household decision-making, gender roles in community development, and gender roles in skill development etc.

Appendix – A

INTERVIEW SCHEDULE

Gender Roles in Livelihood Activities under Shifting Cultivation System in Mizoram

Schedule No. : ☐☐-☐☐
Name of Village : _____
RD Block : _____
District : _____
Name of Investigator : _____
Date of Interview : __ __/__ __/__ __ __ __
(*Day/Month/Year)*
Contact No. of Informant: __ __ __ __ __ __ __ __ __ __

Part I. Socio-Economic Profile

A. Personal

1. Name *(Optional)*: _____
2. Age: __ __ years
3. Educational qualification *(completed)*

   ☐ Primary ☐ Middle ☐ High School ☐ Higher Secondary

   ☐ Graduate ☐ Post Graduate ☐ Other *(specify)*: _____
4. Other household members *(a part from the respondent)*

Sl. No.	Name	Sex	Age	Educational Qualification
4.1.	_____	_____	_____	_____
4.2.	_____	_____	_____	_____
4.3.	_____	_____	_____	_____
4.4.	_____	_____	_____	_____
4.5.	_____	_____	_____	_____
4.6.	_____	_____	_____	_____
4.7.	_____	_____	_____	_____

5. Ration Card held by the family: ☐ Yellow ☐ Blue ☐ White

   (Yellow = AAY; Blue = Priority Household; White = APL (Non-FSA)

6. Main source(s) of household income/livelihoods

Sl. No.	Activities	No. of Household Member Involved	Duration of Engagement	Annual Income
6.1.				
6.2.				
6.3.				
6.4.				
6.5.				
6.6.				
6.7.				
Total (Annual Income)				

7. Household expenditure *(of recent or last month)*: Rs. _____

8. Household expenditure on food *(last month)*: Rs. _____ or
   Percentage *(from Sl. 7)*: _____ %

B. Land Holding and Practices

1. Total area of land (a part from jhum) owned by the housedhold *(in Tin)*: _____
2. Area of land cultivated (out of the above) by the household *(in Tin)*: _____
3. Area of jhum land *(in Tin)*: _____
4. Fallow period maintained by the household *(in the recent cycles)*: _____
5. Crops cultivated in permanent farm:

5.1._____ 5.5. _____

5.2._____ 5.6. _____

5.3._____ 5.7. _____

6. Crops cultivated in jhum land:

6.1._____ 6.5. _____

6.2._____ 6.6. _____

6.3._____ 6.7. _____

Part II. Livelihood Activities

A. Shifting Cultivation Activities

1. Year of experience in Shifting Cultivation: _____

2. Allotment of jhum sites

2.1.Time for allotment of jhum site: _____

2.2.How allotment is done: _____

_____

3. Marking of jhum boundaries

3.1.Time of marking jhum boundaries: _____

3.2.How marking of jhum boundaries is carried out: _____

_____

4. Cutting/clearing forest

4.1.Time of cutting/clearing forest: _____

4.2.How cutting/clearing of forest is done: _____

_____

4.3.Total mandays engaged in cutting/clearing forest: _____

4.4.No. of hired labour, if any (a part from household members): _____

5. Drying

5.1.Duration of drying: _____

6. Burning and cross bar setting

6.1.Total mandays engaged in preparation of firelines: _____

6.2.Time of burning: _____

6.3.Duration of burning: _____

6.4.Total mandays engaged in burning: _____

6.5.Total mandays engaged in reburning debris *(mangkhawh)*: _____

6.6.Total mandays engaged in cross bar setting *(changkham)*: _____

6.7.No. of hired labour for burning, reburning debris and cross bar setting, if any (apart from household members): _____

7. Sowing

7.1.Sowing of seeds (time, quantity and how sown):

Seed	Source	Time of sowing	Quantity	How sown

7.2.No. of mandays engaged in sowing: _____

8. Weeding

8.1.No. of weedings in a season: _____

8.2.Time of weeding and mandays engaged:

Weeding	Time	Mandays
1st Weeding		
2nd Weeding		
3rd Weeding		
4th Weeding		
5th Weeding		

8.3.No. of hired labour, if any (a part from household members): _____

9. Harvesting

9.1.Time and quantity of crop harvest

Crop	Time of harvest	Quantity of harvest

_____ _____ _____

_____ _____ _____

_____ _____ _____

9.2.No. of mandays engaged in harvesting: _____

9.3.No. of hired labour, if any (a part from household members): _____

10. Post harvest and marketing

10.1. Transporting crops harvested

Stage	Point of Starting	Point of Destiny	Distance *(in Km)*	Means of Transport	Cost *(If any)*
10.1.1					
10.1.2					
10.1.3					
10.1.4					

10.2. Processing

Sl. No.	Crop	Form of Processing	Purpose *(Consumption/Marketing)*
10.2.1.			
10.2.2.			
10.2.3.			
10.2.4.			
10.2.5.			

10.3. Marketing

Sl. No.	Crop	Form of Marketing *(Green or Processed)*	Mode of Marketing *(Self or Through Others)*	Place of Marketing
10..3.1.				
10..3.2.				
10.3.3.				
10.3.4.				
10.3.5.				

Part III. Gender Role

A. Role performed in shifting cultivation activities

Direction: Indicate respondent's extent of involvement in the following shifting cultivation activities by ticking Yes/No and encircling the corresponding numbers as per scale given below:

High	5
Moderately High	4
Moderate	3
Moderately Low	2
Low	1

Sl. No.	Activity	Involvement	If yes, extent of involvement				
1.	Site selection and land preparation						
1.1.	Attend meeting for site allotment	Yes/No	1	2	3	4	5
1.2.	Make decision in selecting sites	Yes/No	1	2	3	4	5
1.3.	Marking of jhum boundaries	Yes/No	1	2	3	4	5
1.4.	Clearing forest and cutting trees	Yes/No	1	2	3	4	5
1.5.	Making firelines	Yes/No	1	2	3	4	5
1.6.	Firing of jhum land	Yes/No	1	2	3	4	5
1.7.	Refiring debris (Mangkhawh)	Yes/No	1	2	3	4	5
1.8.	Cross bar setting (Changkham)	Yes/No	1	2	3	4	5
1.9.	Construction of jhum hut (thlam)	Yes/No	1	2	3	4	5
2.	Production activities						
2.1.	Sowing seeds	Yes/No	1	2	3	4	5
2.2.	Weeding	Yes/No	1	2	3	4	5
2.3.	Harvesting of crops	Yes/No	1	2	3	4	5
2.4.	Transporting of crop harvests	Yes/No	1	2	3	4	5
3.	Post harvest activities						
3.1.	Processing/Preserving oof crops	Yes/No	1	2	3	4	5
3.2.	Preserving seeds	Yes/No	1	2	3	4	5
3.3.	Bundling for sale	Yes/No	1	2	3	4	5
3.4.	Selling in market	Yes/No	1	2	3	4	5

B. Role performed in other livelihood activities

1. Household chores

Direction: Indicate respondent's extent of involvement in the following activities relating to household chore by ticking (✓) Yes/No and encircling the corresponding numbers as per scale given below:

High	5
Moderately High	4
Moderate	3
Moderately Low	2
Low	1

Sl . No.	Activity	Involvement	If yes, extent of involvement (in scale)				
1.1.	Cooking	Yes/No	1	2	3	4	5
1.2.	Washing clothes	Yes/No	1	2	3	4	5
1.3.	Cleaning utensils	Yes/No	1	2	3	4	5
1.4.	Household cleaning	Yes/No	1	2	3	4	5
1.5.	Caring for children	Yes/No	1	2	3	4	5
1.6.	Vegetable shopping	Yes/No	1	2	3	4	5
1.7.	Household repairing works	Yes/No	1	2	3	4	5
1.8.	Collection of firewoods	Yes/No	1	2	3	4	5
1.9.	Collecting/Fetching water	Yes/No	1	2	3	4	5
1.10.	Financial Management	Yes/No	1	2	3	4	5

2. **Others** (in separate sheets for extent of respondent's involvement in other livelihood activities as per list given in Part II - B.

Direction: Indicate respondent's extent of involvement in the activities relating to the particular livelihood specified below by ticking (✓) Yes/No and encircling the corresponding numbers as per scale given below:

High	5
Moderately High	4
Moderate	3
Moderately Low	2
Low	1

Name of Livelihood: _____

Sl . No.	Activity	Involvement	If yes, extent of involvement (in scale)				
1.		Yes/No	1	2	3	4	5
2.		Yes/No	1	2	3	4	5
3.		Yes/No	1	2	3	4	5
4.		Yes/No	1	2	3	4	5
5.		Yes/No	1	2	3	4	5
6.		Yes/No	1	2	3	4	5
7.		Yes/No	1	2	3	4	5

Name of Livelihood: _____

Sl . No.	Activity	Involvement	If yes, extent of involvement (in scale)				
1.		Yes/No	1	2	3	4	5
2.		Yes/No	1	2	3	4	5
3.		Yes/No	1	2	3	4	5
4.		Yes/No	1	2	3	4	5
5.		Yes/No	1	2	3	4	5
6.		Yes/No	1	2	3	4	5
7.		Yes/No	1	2	3	4	5

Appendix – B

APPENDIX TABLES

Appendix Table 6.1: Gender roles in shifting cultivation

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	**Site selection and land preparation**						
	Attending meeting	4.96	0.24	H	2.6	0	M
	Site selection	4.96	0.24	H	3	0.57	M
	Marking boundaries	4.91	0.36	H	2.71	1.11	M
	Clearing forest	4.8	0.66	H	2.1	0.56	ML
	Making firelines	4.81	0.69	H	2.62	1.06	M
	Burning	4.93	0.4	H	3.33	1.52	M
	Reburning	4.11	1.13	MH	2.61	0.87	M
	Crossbar setting	3.66	1.73	MH	2.44	0.88	ML
	Construction of jhum hut	4.57	0.74	H	2.12	1.26	ML
	Overall	**4.63**	**0.68**	**H**	**2.61**	**0.87**	**M**
2	**Production activities**						
	Sowing Seeds	2.95	1.22	M	3.36	0.98	M
	Weeding	3.32	1.02	M	2.91	0.96	M
	Overall	**3.13**	**1.12**	**M**	**3.13**	**0.97**	**M**
3	**Harvesting**						
	Harvesting	3.14	1.02	M	3.02	1.02	M
	Transporting	3.32	1.07	M	2.84	1.04	M
	Overall	**3.23**	**1.04**	**M**	**2.93**	**1.03**	**M**
4	**Post-harvest Activities**						
	processing/ Preserving crops	2.46	1.50	ML	4.49	0.89	H
	Preserving seeds	2.51	1.52	M	4.42	0.96	MH
	Bundling for sale	2.96	1.42	M	4.42	0.86	MH
	Selling in market	3.06	1.63	M	4.57	0.77	H
	Overall	**2.74**	**1.51**	**M**	**4.47**	**0.87**	**MH**
	Overall-Total	**3.72**	**1.09**	**MH**	**3.37**	**0.91**	**M**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

Appendix Table 6.2: Gender roles in site selection and land preparation *(Zone-wise)*

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	**Attending meeting**						
	South	5	0	H	0	0	0
	West	4.95	0.22	H	2.5	0.70	ML
	East	5	0	H	0	0	0
	Central	4.9	0.44	H	3	0.00	M
	Overall	**4.96**	**0.24**	**H**	**2.6**	**-**	**M**
2	**Site selection**						
	South	5	0	H	0	0	0
	West	4.85	0.48	H	3	0.00	M
	East	5	0	H	0	0	0
	Central	5	0	H	0	0	0
	Overall	**4.96**	**0.24**	**H**	**3**	**0.57**	**M**
3	**Marking boundary**						
	South	5	0	H	0	0	0
	West	4.7	0.65	H	2.4	0.54	ML
	East	4.94	0.22	H	3.5	2.12	M
	Central	5	0	H	0	0	0
	Overall	**4.91**	**0.36**	**H**	**2.71**	**1.11**	**M**
4	**Clearing forest**						
	South	5	0	H	0	0	0
	West	4.7	0.47	H	2	0.63	ML
	East	4.5	1.19	H	2.25	0.50	ML
	Central	5	0	H	0	0	0
	Overall	**4.8**	**0.66**	**H**	**2.1**	**0.56**	**ML**
5	**Making fireline**						
	South	5	0	H	0	0	0
	West	4.75	0.63	H	2.33	0.57	ML
	East	4.5	1.19	H	2.8	1.30	M
	Central	5	0	H	0	0	0
	Overall	**4.81**	**0.69**	**H**	**2.62**	**1.06**	**M**
6	**Burning**						
	South	5	0	H	0	0	0
	West	4.9	0.45	H	3	0.00	M
	East	4.85	0.67	H	3.5	2.12	M
	Central	5	0	H	0	0	0
	Overall	**4.93**	**0.4**	**H**	**3.33**	**1.52**	**M**

Appendix Table 6.2: Gender roles in site selection and land preparation *(Zone-wise)* (Contd..)

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
7	**Reburning**						
	South	4.75	0.71	H	3.33	0.57	M
	West	4	0.97	MH	2.66	0.77	M
	East	3.5	1.19	M	2.6	1.05	M
	Central	4.2	1.28	MH	2.33	0.70	ML
	Overall	**4.11**	**1.13**	**MH**	**2.61**	**0.87**	**M**
8	**Crossbar setting**						
	South	4.28	1.25	MH	3.5	0.70	MH
	West	0	0	0	0	0	0
	East	3.4	0.89	M	2	0.63	ML
	Central	3.41	2.19	M	3	0.00	M
	Overall	**3.66**	**1.73**	**MH**	**2.44**	**0.88**	**ML**
9	**Construction of jhum hut**						
	South	4.75	0.55	H	2.00	1.15	ML
	West	4.75	0.55	H	2.5	0.57	ML
	East	4.15	0.98	MH	2	1.09	ML
	Central	4.65	0.67	H	2.2	1.09	ML
	Overall	**4.57**	**0.74**	**H**	**2.12**	**1.26**	**ML**
Overall-Total		**4.63**	**0.68**	**H**	**2.61**	**0.87**	**M**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

Appendix Table 6.3: Gender roles in production activities

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	**Sowing seeds**						
	South	2.85	1.38	M	3.47	1.00	M
	West	3.5	1.03	M	3.35	1.16	M
	East	2.47	1.26	ML	3.42	1.01	M
	Central	3.1	0.99	M	3.22	0.80	M
	Overall	**2.95**	**1.22**	**M**	**3.36**	**0.98**	**M**
2	**Weeding**						
	South	3.1	1.33	M	2.94	0.82	M
	West	3.5	0.92	M	3.05	0.96	M
	East	3.2	1.09	M	3.1	1.10	M
	Central	3.42	0.69	M	2.6	0.94	M
	Overall	**3.32**	**1.02**	**M**	**2.91**	**0.96**	**M**
Overall-Total		**3.13**	**1.12**	**M**	**3.13**	**0.97**	**M**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

Appendix Table 6.4: Gender roles in harvesting *(Zone-wise)*

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	**Harvesting**						
	South	3	1.29	M	3.35	0.78	M
	West	3.27	1.01	M	2.84	1.16	M
	East	3.16	0.92	M	3.05	1.19	M
	Central	3.15	0.83	M	2.9	0.91	M
	Overall	**3.14**	**1.02**	**M**	**3.02**	**1.02**	**M**
2	**Transporting**						
	South	3.4	1.39	M	2.52	1.06	M
	West	3.44	1.04	M	3.05	0.96	M
	East	3.29	1.04	M	2.88	1.23	M
	Central	3.15	0.76	M	2.9	0.91	M
	Overall	**3.32**	**1.07**	**M**	**2.84**	**1.04**	**M**
Overall-Total		**3.23**	**1.04**	**M**	**2.93**	**1.03**	**M**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

Appendix Table 6.5: Gender roles in post-harvest activities *(Zone-wise)*

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	**Processing**						
	South	2.5	1.73	M	4.41	0.61	MH
	West	3	1.09	M	4.5	0.92	H
	East	3.66	2.30	MH	4.93	0.25	H
	Central	1.66	0.70	ML	4.2	1.23	MH
	Overall	**2.46**	**1.5**	**ML**	**4.49**	**0.89**	**H**
2	**Preserving seeds**						
	South	2.88	1.69	M	4.52	0.79	H
	West	3	1.09	M	4.5	0.92	H
	East	3	2.00	M	4.47	1.28	MH
	Central	1.84	1.28	ML	4.21	0.85	MH
	Overall	**2.51**	**1.52**	**M**	**4.42**	**0.96**	**MH**
3	**Bundling**						
	South	3.11	1.53	M	4.55	0.70	H
	West	3.55	0.88	MH	4.06	1.12	MH
	East	4.33	1.15	MH	4.87	0.00	H
	Central	2	1.26	ML	4.21	0.85	MH
	Overall	**2.96**	**1.42**	**M**	**4.42**	**0.86**	**MH**
4	**Selling**						
	South	2.83	1.72	M	4.78	0.41	H
	West	3.87	1.24	MH	4.53	0.83	H
	East	3.14	1.46	M	4.41	1.00	MH
	Central	2.44	1.94	ML	4.52	0.79	MH
	Overall	**3.06**	**1.63**	**M**	**4.57**	**0.77**	**H**
Overall-Total							

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

Appendix Table 6.6: Gender roles in household chores *(Zone-wise)*

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	**Cooking**						
	South	2.50	2.12	ML	4.80	0.69	H
	West	3.00	0.00	M	4.95	0.22	H
	East	5.00	0.00	H	5.00	0.00	H
	Central	2.7	2.1	M	4.9	0.5	H
	Overall	3	1.73	M	4.9	0.43	H
2	**Washing clothes**						
	South	3.00	0.00	M	4.90	0.44	H
	West	3.00	0.00	M	4.95	0.22	H
	East	5.00	0.00	H	4.75	1.11	H
	Central	1.0	0.0	L	5.0	0.2	H
	Overall	3	1.63	M	4.88	0.61	H
3	**Cleaning utensils**						
	South	4.00	0.00	MH	4.85	0.67	H
	West	0.00	0.00	0.00	5.00	0.00	H
	East	5.00	0.00	H	4.75	1.11	H
	Central	1.0	0.0	L	4.9	0.3	H
	Overall	3.33	2.08	M	4.87	0.66	H
4	**Household cleaning**						
	South	2.00	0.00	ML	4.95	0.22	H
	West	5.00	0.00	H	5.00	0.00	H
	East	5.00	0.00	H	5.00	0.00	H
	Central	1.0	0.0	L	5.0	0.2	H
	Overall	3.25	2.06	M	4.97	0.15	H
5	**Caring for children**						
	South	1.00	0.00	L	4.95	0.22	H
	West	0.00	0.00	0.00	5.00	0.00	H
	East	5.00	0.00	H	5.00	0.00	H
	Central	1.0	0.0	L	5.0	0.2	H
	Overall	2.33	2.3	ML	4.97	0.15	H
6	**Vegetable shopping**						
	South	1.00	0.00	L	4.95	0.22	H
	West	3.76	1.01	MH	3.86	1.12	MH
	East	5.00	0.00	H	5.00	0.00	H
	Central	1.0	0.0	L	5.0	0.2	H
	Overall	3.5	1.36	M	4.74	0.68	H

Appendix Table 6.6: Gender roles in household chores *(Zone-wise) (Contd…)*

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
7	**Household repairing**						
	South	5.00	0.00	H	0.00	0.00	0.00
	West	5.00	0.00	H	0.00	0.00	0.00
	East	5.00	0.00	H	0.00	0.00	0.00
	Central	5.0	0.0	H	0.0	0.0	0.0
	Overall	5.00	0.00	H	0.00	0.00	0.00
8	**Collection of firewood**						
	South	3.44	1.46	M	3.06	1.33	M
	West	3.70	1.15	MH	4.11	0.99	MH
	East	3.77	1.11	MH	3.28	1.13	M
	Central	3.4	1.1	M	3.1	1.1	M
	Overall	3.44	1.46	M	3.06	1.33	M
9	**Fetching water**						
	South	3.53	1.12	MH	3.46	1.40	M
	West	3.50	1.43	M	4.17	0.95	MH
	East	3.00	1.29	M	4.16	0.85	MH
	Central	2.7	1.0	M	4.0	1.1	MH
	Overall	3.16	1.23	M	3.97	1.08	MH
10	**Financial management**						
	South	0.00	0.00	0.00	5.00	0.00	H
	West	4.80	0.63	H	4.81	0.60	H
	East	3.60	1.34	MH	4.72	0.66	H
	Central	4.3	1.5	MH	4.9	0.5	H
	Overall	4.36	1.11	MH	4.86	0.49	H
Overall-Total		**3.44**	**1.47**	**M**	**4.15**	**0.54**	**MH**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

Appendix Table 6.7: Gender roles in livestock farming *(Zone-wise)*

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	**Purchasing**						
	South	2.7	0.82	M	2.31	0.72	ML
	West	2.18	1.14	ML	3.06	0.93	M
	East	2.09	1.48	ML	2.34	1.37	ML
	Central	3.31	1.28	M	3.25	1.1	M
	Overall	2.57	1.18	M	2.74	1.03	M
2	**Construction of house**						
	South	5	0	H	0	0	0
	West	4.87	0	H	0	0	0
	East	5	0	H	0	0	0
	Central	5	0	H	0	0	0
	Overall	4.64	0.18	H	0	0	0
3	**Feed collection**						
	South	3.4	1.71	M	1.92	1.93	ML
	West	1.87	1.35	ML	3.62	0.91	MH
	East	2.23	1.78	ML	2.61	1.75	M
	Central	2.12	1.24	ML	3.5	0.92	M
	Overall	2.4	1.52	ML	2.91	1.37	M
4	**Feeding**						
	South	2.61	2.23	M	2.23	1.91	ML
	West	1.93	2.06	ML	3.43	1.58	M
	East	2.66	1.05	M	2.01	1.14	ML
	Central	1.79	0.95	ML	3.58	0.95	MH
	Overall	2.26	1.67	ML	2.8	1.45	M
5	**Marketing/Selling**						
	South	3.25	1.4	M	1.61	1.14	ML
	West	2.03	2.17	ML	3.18	2	M
	East	3.28	0.83	M	1.79	0.96	ML
	Central	2.89	1.4	M	3.39	1.24	M
	Overall	2.79	1.51	M	2.61	1.53	M
Overall-Total		**2.93**	**1.21**	**M**	**2.21**	**1.07**	**ML**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

Appendix Table.6.8: Gender roles in forest resource based livelihood activities *(Zone-wise)*

Sl. no	Activity	Male			Female		
		Mean	Std. Dev	Description	Mean	Std. Dev	Description
1	**Collection**						
	South	5	0	H	0	0	0
	West	5	0	H	0	0	0
	East	4.92	1.76	H	0	0	0
	Central	4.93	0.57	H	0	0	0
	Overall	**4.96**	**0.58**	**H**	**0**	**0**	**0**
2	**Bundling**						
	South	0	0	0	5	0	H
	West	5	0	H	0	0	0
	East	0	0	0	0	0	0
	Central	1.33	1.52	L	3.6	0.57	MH
	Overall	**1.58**	**0.38**	**ML**	**2.15**	**0.14**	**ML**
3	**Marketing**						
	South	0	0	0	5	0	H
	West	2.8	0.44	M	3.2	0.44	M
	East	0	0	0	0	0	0
	Central	4	0	MH	5	0	H
	Overall	**1.7**	**0.1**	**ML**	**3.3**	**0.11**	**M**
Overall-Total		**2.74**	**0.35**	**M**	**1.81**	**0.08**	**ML**

***Source**: Field Survey, 2016-17*

Level of Involvement: 4.51 - 5.00 High (H)
3.52 - 4.50 Moderately High (MH)
2.51 - 3.50 Moderate (M)
1.51 - 2.50 Moderately Low (ML)
1.00 - 1.50 Low (L)

Appendix Table 6.9: t-test for gender roles in shifting cultivation activities

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	**Site selection and land preparation**	**4.37**	**0.38**	**43.39**	**158**	**0.000**
	Attend meeting for site allotment	4.96	0.10	75.68	158	0.000
	Make decision in selecting sites	4.96	0.11	69.39	158	0.000
	Marking of jhum boundaries	4.85	0.24	38.94	158	0.000
	Clearing forest and cutting trees	4.80	0.33	35.87	158	0.000
	Making firelines	4.81	0.26	36.98	158	0.000
	Firing of jhum land	4.88	0.13	44.05	158	0.000
	Refiring debris (Mangkhawh)	4.11	1.30	13.69	158	0.000
	Cross bar setting (Changkham)	1.44	0.30	2.64	158	0.009
	Construction of jhum hut (thlam)	4.53	0.66	22.90	158	0.000
2	**Production activities**	**2.89**	**2.82**	**0.36**	**158**	**0.718**
	Sowing seeds	2.74	2.99	-1.12	158	0.266
	Weeding	3.05	2.66	1.95	158	0.053
3	**Harvesting**	**3.02**	**2.68**	**1.79**	**158**	**0.074**
	Harvesting of crops	2.95	2.81	0.70	158	0.485
	Transporting of crop harvests	3.10	2.56	2.59	158	0.011
4	**Postharvest activities**	**1.08**	**3.92**	**-12.28**	**158**	**0.000**
	Processing/Preserving of crops	0.92	3.99	-12.23	158	0.000
	Preserving seeds	1.04	3.92	-11.22	158	0.000
	Bundling for sale	1.19	3.81	-9.64	158	0.000
	Selling in market	1.15	3.95	-10.02	158	0.000
	Overall	**2.8**	**2.35**	**18.94**	**158**	**0.252**

Source: *Field survey 2016-17*

Appendix Table 6.10: t-test for gender roles in site selection and land preparation *(Zone-wise)*

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	**Attend meeting for site allotment**	**4.96**	**0.10**	**75.68**	**158**	**0.000**
	South	5	0	-	-	-
	West	4.95	0.25	25.71	38	0
	East	5	-	-	-	-
	Central	4.9	0.15	26.35	38	0
2	**Site selection**	**4.96**	**0.11**	**69.39**	**158**	**0.000**
	South	5	0	-	-	-
	West	4.85	0.45	16.36	38	0
	East	5	-	-	-	-
	Central	5	0	-	-	-
3	**Marking of jhum boundaries**	**4.85**	**0.24**	**38.94**	**158**	**0.000**
	South	5	0	-	-	-
	West	4.7	0.6	14.36	38	0
	East	4.7	0.35	11.90	38	0
	Central	5	0	-	-	-
4	**Clearing forest and cutting trees**	**4.80**	**0.33**	**35.87**	**158**	**0.000**
	South	5	0	-	-	-
	West	4.7	0.6	16.67	38	0
	East	4.5	0.7	9.32	38	0
	Central	5	0	-	-	-
5	**Making firelines**	**4.81**	**0.26**	**36.98**	**158**	**0.000**
	South	5	0	-	-	-
	West	4.75	0.35	18.16	38	0
	East	4.5	0.7	9.32	38	0
	Central	5	0	-	-	-
6	**Firing of jhum land**	**4.88**	**0.13**	**44.05**	**158**	**0.000**
	South	5	0	-	-	-
	West	4.9	0.15	26.35	38	0
	East	4.85	0.35	10.94	38	0
	Central	5	0	-	-	-
7	**Refiring debris *(Mangkhawh)***	**4.11**	**1.30**	**13.69**	**158**	**0.000**
	South	4.75	0.5	13.31	38	0
	West	4	1.6	26.35	38	0
	East	3.5	2.05	3.54	38	0.001
	Central	4.2	1.05	7.79	38	0
8	**Cross bar setting (Changkham)**	**1.44**	**0.30**	**2.64**	**158**	**0.009**
	South	1.5	0.35	2.09	38	0.044
	West	-	-	-	-	-
	East	0.85	0.6	0.60	38	0.55
	Central	2.05	0.25	2.09	38	0.044
9	**Construction of jhum hut *(Thlam)***	**4.53**	**0.66**	**22.90**	**158**	**0.000**
	South	4.75	0.4	17.86	38	0
	West	4.75	0.5	16.02	38	0
	East	4.15	1.2	5.92	38	0
	Central	4.65	0.55	14.24	38	0
	Overall	**4.37**	**0.38**	**43.39**	**158**	**0.000**

Source: *Field survey 2016-17*

Appendix Table 6.11: t-test for gender roles in production activities *(Zone-wise)*

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	**Sowing seeds**	**2.74**	**2.99**	**-1.12**	**158**	**0.266**
	South	2.85	2.95	0.23	38	0.832
	West	2.8	2.85	0.95	38	0.925
	East	2.35	3.25	-2.19	38	0.035
	Central	2.95	2.9	0.13	38	0.898
2	**Weeding**	**3.05**	**2.66**	**1.95**	**158**	**0.053**
	South	3.1	2.5	1.43	38	0.161
	West	3.15	2.6	1.24	38	0.224
	East	2.7	2.95	-0.60	38	0.55
	Central	3.25	2.6	2.10	38	0.043
	Overall	**2.89**	**2.82**	**0.36**	**158**	**0.718**

Source: *Field survey 2016-17*

Appendix Table 6.12: t-test for gender roles in harvesting activities *(Zone-wise)*

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	**Harvesting of crops**	**2.95**	**2.81**	**0.70**	**158**	**0.485**
	South	3	2.85	0.35	38	0.73
	West	2.95	2.7	0.59	38	0.561
	East	2.8	2.8	0.12	38	0.905
	Central	3	2.9	0.32	38	0.753
2	**Transporting of crop harvests**	**3.10**	**2.56**	**2.59**	**158**	**0.011**
	South	3.4	2.15	2.89	38	0.006
	West	3.1	2.6	1.1	38	0.279
	East	2.9	2.6	0.66	38	0.513
	Central	3	2.9	0.33	38	0.746
	Overall	**3.02**	**2.68**	**1.79**	**158**	**0.074**

Source: *Field survey 2016-17*

Appendix Table 6.13: t-test for gender roles in post-harvest activities *(Zone-wise)*

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	**Processing/Preserving of crops**	**0.92**	**3.99**	**-12.23**	**158**	**0.000**
	South	1.5	3.75	-4.02	38	0
	West	0.9	4.05	-6.31	38	0
	East	0.55	3.95	-5.95	38	0
	Central	0.75	4.2	-9.82	38	0
2	**Preserving seeds**	**1.04**	**3.92**	**-11.22**	**158**	**0.000**
	South	1.3	3.85	-4.42	38	0
	West	0.9	4.05	-6.31	38	0
	East	0.75	3.8	-5.28	38	0
	Central	1.2	4	-6.76	38	0
3	**Bundling for sale**	**1.19**	**3.81**	**-9.64**	**158**	**0.000**
	South	1.4	4.1	-4.96	38	0
	West	1.6	3.25	-2.71	38	0.01
	East	0.65	3.9	-5.55	38	0
	Central	1.1	4	-6.97	38	0
4	**Selling in market**	**1.15**	**3.95**	**-10.02**	**158**	**0.000**
	South	0.85	4.55	-8.41	38	0
	West	1.55	3.4	-2.77	38	0.009
	East	1.1	3.75	-4.65	38	0
	Central	1.1	4.1	-5.64	38	0
	Overall	**1.08**	**3.92**	**-12.28**	**158**	**0.000**

Source: *Field survey 2016-17*

Appendix Table 6.14: t-test for gender roles in household chores *(Zone-wise)*

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	**Cooking**	**0.26**	**4.84**	**-34.01**	**158**	**0.000**
	South	0.25	4.80	-17.76	38	0
	West	0.15	4.95	30.36	38	0
	East	0.25	5.00	-12.73	38	0
	Central	0.4	4.85	-15.49	38	0
2	**Washing clothes**	**0.15**	**4.89**	**-44.33**	**158**	**0.000**
	South	0.15	4.90	-26.35	38	0
	West	0.15	4.95	30.36	38	0
	East	0.25	4.75	-12.73	38	0
	Central	0.5	4.95	-69.30	38	0
3	**Cleaning utensils**	**0.12**	**4.88**	**-43.46**	**158**	**0.000**
	South	0.2	4.85	-18.60	38	0
	West	0	5.00	-	-	-
	East	0.25	4.75	-12.73	38	0
	Central	0.5	4.90	-57.01	38	0
4	**Household cleaning**	**0.16**	**4.91**	**-42.41**	**158**	**0.000**
	South	0.1	4.95	-43.38	38	0
	West	0.25	5.00	0.00	0	0
	East	0.25	5.00	-12.73	38	0
	Central	0.5	4.95	-69.30	38	0
5	**Caring for children**	**0.09**	**4.91**	**-52.80**	**158**	**0.000**
	South	0.5	4.95	-69.30	38	0
	West	0	5.00	-	-	-
	East	0.25	5.00	-12.73	38	0
	Central	0.5	4.95	-69.30	38	0
6	**Vegetable shopping**	**0.70**	**4.39**	**-15.81**	**158**	**0.000**
	South	0.5	4.95	-69.30	38	0
	West	2.45	2.90	-0.71	38	0.479
	East	0.25	4.75	-12.73	38	0
	Central	0.5	4.95	-69.30	38	0
7	**Household repairing works**	**5.00**	**0.00**	**-**	**-**	**-**
	South	5	0.00	-	-	-
	West	5	0.00	-	-	-
	East	5	0.00	-	-	-
	Central	5	0.00	-	-	-
8	**Collection of firewoods**	**2.80**	**2.68**	**0.44**	**158**	**0.659**
	South	3.1	2.30	1.44	38	0.159
	West	1.85	3.50	-2.98	38	0.01
	East	3.4	2.30	2.05	38	0.047
	Central	2.85	2.60	0.51	38	0.613
9	**Collecting/Fetching water**	**1.98**	**3.39**	**-4.96**	**158**	**0.000**
	South	2.55	2.85	-0.49	38	0.628
	West	1.75	3.55	-2.98	38	0.005
	East	1.95	3.75	-3.43	38	0.001
	Central	1.75	3.40	-3.29	38	0.002

Appendix Table 6.14: t-test for gender roles in household chores *(Zone-wise) (Contd…)*

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
10	**Financial Management**	**1.04**	**4.01**	**-9.75**	**158**	**0.000**
	South	0	5.00	-	-	-
	West	2.4	2.65	-0.32	38	0.753
	East	0.9	4.25	-6.42	38	0
	Central	0.85	4.15	-5.66	38	0
	Overall	**1.23**	**3.89**	**-28.44**	**158**	**0.000**

Source: *Field survey 2016-17*

Appendix Table 6.15: t-test for gender roles in livestock farming *(Zone-wise)*

Sl. no	Activity	Average		t-statistic	df	Sig.
		Male	Female			
1	**Purchasing**	**1.23**	**1.31**	**-0.39**	**158**	**0.694**
	South	1.7	1.45	0.71	38	0.48
	West	0.87	1.22	-0.81	38	0.43
	East	1.15	1.32	-0.46	38	0.65
	Central	1.2	1.25	-0.10	38	0.92
2	**Construction of animal house**	**2.42**	**0**	**10.02**	**158**	**0.000**
	South	3.12	0	-	-	-
	West	1.95	0	-	-	-
	East	2.75	0	-	-	-
	Central	1.87	0	-	-	-
3	**Feed collection**	**1.32**	**1.51**	**-2.38**	**158**	**0.019**
	South	2.25	1.25	1.58	38	0.122
	West	0.75	1.45	-1.37	38	0.178
	East	1.45	1.7	-0.43	38	0.67
	Central	0.85	1.65	-1.51	30	0.14
4	**Feeding**	**0.53**	**0.83**	**-2.38**	**158**	**0.019**
	South	0.91	0.92	-0.05	38	0.963
	West	0.47	0.88	-1.34	38	0.187
	East	0.46	0.85	-1.76	38	0.86
	Central	0.3	0.7	-1.92	38	0.063
5	**Marketing**	**0.72**	**0.89**	**-0.30**	**158**	**0.766**
	South	1.06	0.87	0.77	38	0.449
	West	0.55	1.68	-0.76	38	0.452
	East	0.73	0.75	-0.62	38	0.951
	Central	0.56	0.65	-0.38	38	0.709
	Overall	**1.24**	**0.9**	**2.22**	**158**	**0.028**

Source: *Field survey 2016-17*

Appendix – C

FIELD WORK PHOTOS

1. Interview with a respondent in jhum field

2. Drying of jhum field after cutting

3. Burning of jhum

4. Sowing of seeds after burning

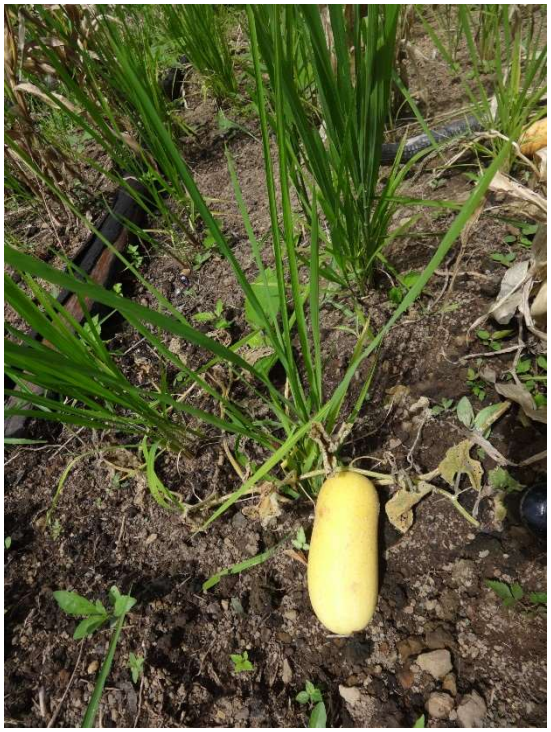
5. Construction of jhum hut

6. Jhum field

7. Jhum field

8. Weeding

9. Jhum crop (Cucumber)



10. Jhum crop (Brinjal)

11. Harvesting of jhum crops

12. Harvesting of jhum paddy

13. Threshing of paddy

14. Paddy harvest

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ABSTRACT

GENDER ROLES IN LIVELIHOOD ACTIVITIES UNDER SHIFTING CULTIVATION SYSTEM IN MIZORAM

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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CONTENTS

1. Introduction:

The present study attempts to identify gender roles in livelihood activities under shifting cultivation system in Mizoram. The purpose of the study is to determine various activities performed by male and female in shifting cultivation and other livelihood activities with special references to Mizoram.

The definition of shifting cultivation is given by numbers of scholars, environmentalist, foresters, development practitioners and policy makers, focusing on the technique and land use pattern followed by primitive communities.

Conklin (1961) defines shifting cultivation as "any continuing agriculture system in which impermanent clearings are cropped for shorter periods in years then they are allowed to remain fallow."

Shifting cultivation is extensively practiced throughout the world in different countries by different tribal communities. It occupies a distinct place in the tribal economy. It constitutes a vital part of the socio-economic network of the tribal life particularly the hill tribal' economy, which is regarded as the principal sources of livelihood. Shifting cultivation is considered to be the most ancient system of agriculture (Rath, 2015). The practice of shifting cultivation has been traced back to the ancient, dating back to the Neolithic period between the years 13,000 to 3,000 B.C. Sharma (1976) note that the origin of shifting cultivation is often traced back to the Neolithic period dated to 7000 BC on the basis of archaeological data.

Shifting cultivation is practiced by numbers of tribes throughout the tropical and sub-tropical region of the world. It has been recorded that the primitive communities of 63 countries in Africa, Asia, South America and Central America follow the practice of shifting cultivation.

Shifting cultivation occupies a distinct place in the tribal economy since the form of cultivation is traditional which provides subsistence income to the rural household. In 1983, the Task Force on shifting cultivation (Ministry of Agriculture) estimated that the total area under this system was 14,66,000 hectares (3,86,900 hectares annually) and 4,43,336 tribal families were engaged (Datta et al. 2010). The practice of shifting cultivation is prevalent in the North-Eastern states, Bihar, Madhya Pradesh, Maharashtra, Karnataka, Andhra Pradesh, Kerala, Tamil Nadu, Gujarat and Odisha. Though the cultivation system is spreading extensively in the sixteen states of India, the nomenclature and mode of cultivation of this practice deviates slightly from region to region, conforming the rites and rituals of forest dwellers.

Shifting cultivation in Mizoram

The pre-colonial Mizo economy was pre-dominantly agrarian in nature. Apart from domestication of animals, hunting and fishing, agriculture was the backbone of the Mizo economy. Jhum cultivation (or shifting cultivation) was practiced by the Mizos since time immemorial (Vanlalhruaia, 2013). In the present era, the dependency of Mizoram economy on shifting cultivation is still said to be stably relying on agriculture since majority of the households are engaged in shifting cultivation for their livelihoods as reported by NERLP, (2011) that 61.37 percent are cultivators engaged in agricultural activities by practicing shifting cultivation.

Sadangi (2008) depicts the livelihoods of rural economy in Mizoram that literally confines in the practiced of shifting cultivation stating that “Mizos are agriculturists, practicing what is known as “jhum cultivation” or slash -and -burn system of cultivation. They cut down the jungles, burn the dried trunks and leaves and then till the soil. All their activities revolve around this cultivation and their festivals are connected with such agricultural operations.”

The three main festivals of the Mizos viz. *Chapchar Kut, Mim Kut* and *Pawl Kut* are immensely associated with various stages of shifting cultivation. Lalthangliana (2001) affirms that these festivals were initially celebrated from 1400 - 1700 A.D. relating to the cultural history of Mizos. The evolution and historical background of these festivals portray the shifting cultivation in connection with the timings and activities performed. Therefore, the elements of shifting cultivation have already reflected on the festivals which are observed by the Mizos in one way or the other.

Gender roles in shifting cultivation and other livelihood activities

The activities of shifting cultivation are sequential and arduous requiring more spans of time and labour from initial to the final operational steps. The consecutive tasks involved in shifting cultivation are:

1) **Site selection and land preparation:** The activities identified under site selection and land preparation included attend meeting for site allotment, site selection, marking jhum boundaries, clearing forest, preparation of firelines, burning, reburning, crossbar setting and construction of jhum hut
2) **Production activities:** The activities identified in the production stage include two main activities viz. sowing and weeding.
3) **Harvesting:** The activities identified under harvesting included harvesting and transporting of crops.
4) **Post-harvest activity:** Post-harvest activity is the final activities of shifting cultivation which included processing/preserving of crops, preserving seeds, bundling and selling of crops.

The livelihood activities in shifting cultivation also involved farm and non-farm activities which includes livestock farming, collection of forest resources and

engagement in household chores that provides subsistence income and contribution to the family. Thus, active participation of males and females are required for the effective accomplishment of these activities.

The household activities are generally classified into cooking, washing clothes, cleaning utensils, household cleaning, caring for children, shopping, household repairing works, collection of firewoods, fetching water and financial management. The roles of gender in certain activities may differ based on the composition of family size, traditions, components and availability of work.

The subsistence income of rural household needs to supplement income from other sources of livelihoods other than shifting cultivation. Hence, engagement in livestock farming, collection of forest resources and other livelihood activities are pursued to sustain their livelihoods. Reports of FAO – ESA (2011) mention that female time use in agriculture varies by crop, production cycle, age and ethnic group. In general, weeding and harvesting were predominantly female activities. The overall labour burden of rural women exceeds that of men and includes a higher proportion of unpaid responsibilities related to preparing food and collecting fuel and water. Women's participation in rural labour markets varies considerably across regions, but invariably women are overrepresented in unpaid, seasonal and part-time work and found out that women are often paid less than men, for the same work.

It is further stated by Lalrinchhani (2004) in her study on socio-economic history of the early Mizo that men folk do not take part in domestic work in the household; rather they directed their energy towards defence, hunting and building houses in the livelihood activities on shifting cultivation. Though there is no such clear division of labour assigned to male and female in performing shifting cultivation and other livelihood activities, it is often perceived that certain activities are performed

by males and the others are performed by females. Moreover, the involvement of gender in activities relating to shifting cultivation and other livelihood activities seem to rely on traditions, family composition, community differences, convenience and availability of work. A problem of study was therefore conceived to find out the gender roles in different livelihood activities under shifting cultivation in the context of Mizoram.

Objectives of the Study

The study on the topic "Gender Roles in Livelihood Activities under Shifting Cultivation System in Mizoram" aims at achieving the various objectives as follows:

1) To identify existing livelihood activities under shifting cultivation.
2) To identify gender roles in performing various livelihood activities under shifting cultivation.
3) To analyse gender contributions towards household economy under shifting cultivation; and
4) To identify constraints facing gender in performing the livelihood activities and suggest strategies for addressing the identified issues.

Scope and Limitations of the Study

The study confines itself only to the gender roles in livelihood activities under shifting cultivation system in Mizoram.

The area of the study is only confined to sixteen sample villages in Mizoram namely Noatlah-II, Lobo, Theiri, Tisi-I, Andermanik, Rajiv Nagar, Zawlnuam, Tuipuibari, Vapar, Ngur, Ngaizawl, Khawzawl, Phulmawi, Tlungvel, Sailutar and Ratu which were randomly selected based on the households who were practicing shifting cultivation at the time of the study.

The study is limited to certain variables such as socio-economic profile of the respondents, livelihood activities under shifting cultivation and gender roles in livelihood activities under shifting cultivation.

The sampling technique used in the study and the data collected from the sample which is comparatively less in number would not allow to make inferences about the larger population from which the sample is drawn. Presentation and interpretation of the study findings also have their own limitations as the information collected were based on the simple recall of the respondents.

2. Research Methodology

In order to fulfil the objectives of the study, a sound and appropriate methodology is pre-requisite in research. Selection of research topic, area of the study, sample size, tools for data collection, sampling techniques and data analysis process determines the validity of research in fulfilling the objectives of the study. The research design should be well organized, co-operated and suited to supplement the quantitative and qualitative study of the research. This chapter presents the research methodology of the study.

Area of the Study

As per census reports 2011, the population of Mizoram is 10,91,014 and is the 2nd least populous state in the country. With the three newly created districts, there are now eleven districts in Mizoram. However, at the time of the study there were eight districts and the study were conducted in four districts namely Aizawl (depicted as central zone), Champhai (depicted as east zone), Mamit (depicted as west zone) and Siaha (depicted as south zone).

The main communities are Mara, Chakma, Reang (also known as Bru or Tuikuk), Paite, Mizo and Hmar. Most of these communities have their settlements concentrated in a particular district. The Maras are mostly settled in Siaha district and it is the dominant community group in the south, Chakmas and Brus are highly concentrated in western and southern part of Mizoram. The Paites settled in the eastern part of Mizoram, mainly in Champhai and Khawzawl districts while Mizos and Hmar communities are mostly concentrated in Aizawl district. As it was the interest of the study to look into gender roles in livelihood activities under shifting cultivation system among the different communities, the study purposely selected six community groups practicing shifting cultivation in Mizoram. Selection of the study area was based on

the settlement of these different community groups practicing shifting cultivation. There are different community groups settled in different geographical locations of Mizoram.

Sample of the Study

The study used purposive sampling method wherein the selection of sample for the study was mainly based on those households practicing shifting cultivation. As it was also of interest of the study to see the differences in livelihood activities among different communities under shifting cultivation, the samples were identified on the basis of different community groups settled in different geographical locations in the State.

A total of five households each were selected from the sample villages to make a total of 80 households altogether. From each sample households, two respondents (one male and one female) were interviewed which made a total of 160 respondents (80 males and 80 females). Sampling procedure followed in the study is presented in the following Table 2.3.1.

Table 2.3.1: Distribution of sample size

District	No.of RD Block	No.of village	No.of Household	No.of Respondents		
				Male	Female	Total
Siaha	2	4	20	20	20	40
Mamit	1	4	20	20	20	40
Champhai	2	4	20	20	20	40
Aizawl	2	4	20	20	20	40
Total	**7**	**16**	**80**	**80**	**80**	**160**

Tools for Data Collection

The required data for the study were collected from primary and secondary sources. Primary sources of information were collected using Interview Schedule formulated for the purpose of the study. The structure of the Interview Schedule was

drafted in accordance with the objectives of the study which is basically grouped into socio-economic profile of the respondents, land holding and practices, shifting cultivation activities, post-harvest and marketing, gender roles in shifting cultivation and livelihood activities.

The Interview Schedule was pre-tested to a group of farmers who were not included in the samples of the study. Based on the results of the pre-test, necessary revision or improvement of the interview schedule was made before the actual collection of field data. Secondary data relevant to the study were also collected from various sources such as Census Reports and Statistical Abstracts, internet, books and journals.

Data Collection

The primary data were collected by the researcher in all the sample villages. The researcher had to engage interpreters in sample villages under Mamit district as there was communication problem in interviewing the respondents. The male and female respondents were interviewed separately with the help of Interview Schedules prepared for them. The field data were collected during October 2016 to April 2017.

Data Analysis

In order to achieve accurate results on quantitative data, appropriate statistical tool is vital for data processing and analysis. The data obtained from the field were encoded and analysed using the following statistical tools:

Quantifiable data were processed and analysed using Statistical Package for Social Sciences (SPSS). Descriptive statistics such as frequency counts, percentage, mean, standard deviation and range were used for the descriptive portion of the data.

T-test was applied to examine the differences between male and female respondents in their average performance on livelihood activities under shifting cultivation system.

3. Results and Discussion

The results of the study are presented and discussed as follows: -

Socio economic profile

The informants of the households were 63.75 percent male and 36.25 percent female. The mean age of the respondents was 48.75 years and the highest percentage of the respondents (30 %) were between the age group of 40-50 years. The highest percentage of the respondents (33.75 %) attained middle school level of education. The average numbers of family members consist of 6.01 and 73.75 percent of the respondent's households comprised of 5-10 members in a family. The highest percentage (65%) of the respondents' family were categorized as Priority Households (PHH).

The average household monthly expenditure was Rs 6306.25 with maximum expenditure of Rs 35000/- and minimum expenditure of Rs 1000/-. It was observed that majorities (85%) of the respondents' household monthly expenditure was lesser than Rs 5000. The highest percentage (37.5%) of the household's monthly expenditure on food/consumable item was 60-80 percent out of the total expenditure. The average annual income of the household was Rs 65943.75/- with minimum income of Rs 2000/- and maximum income of Rs 582000/-. The result shows that 25 percent of the respondent annual income was lesser than Rs 10000. Similarly, the same percentages (25%) of the household's annual income was more than Rs 50000. The average annual income on agriculture sources was Rs 31400/- with minimum of Rs 5000/- and maximum of Rs 120000/-. Moreover, the households (25%) annual income from agriculture sources were more than Rs 50000. Similarly, households with 25 percent of the respondent's annual income on agriculture was lesser than Rs

10000/-. The highest percentage (27.5%) of the respondents experienced shifting cultivation for 30-40 years.

Livelihood activities under shifting cultivation

The landholding in shifting cultivation were group into permanent land and jhum land. Majority (46.25%) of the respondents managed both permanent and jhum land. There were about one-third (32.50%) households who managed shifting cultivation in their permanent land while 21.25 percent households managed shifting cultivation in the jhum plot allotted by the VCs.

The average size of permanent land owned by the respondent households was 4.8acre with minimum of 1acre and maximum of 20acre. Majorities of the respondent's household (59.15%) belonged to a category who managed an area 'below 3 acres' of permanent land. The area of permanent land cultivated on average was 2.29 acre ranging from 1 acre to 12.5 acre. It was further noted that the size of land cultivated by highest number (31.25%) of respondents was 3 – 6 acres.

The average area of jhum cultivated by the respondents was 1.94 acre ranging from a minimum of 0.5 acre and a maximum of 5 acres. Moreover, the jhum area cultivated by highest number (38.75%) measured '1 – 2 acres' .

Variety of crops are cultivated in permanent land which include 1) Tree bean *(zawngtah)* (28.75%), 2) Orange *(serthlum)* (21.25%), 3) Banana *(balhla)* (20%), 4) Pineapple *(lakhuihthei)* (15%), 5) Broomstick *(hmunphiah)* (13.75%), 6) Mango *(theihai)* (12.50%), 7) Climbing wattle *(khanghu)* (8.75%), 8) Lemon *(nimbu)* (8.75%), 9) Glory bower *(phuihnam)* (5%), 10) Snowflake *(kawhtebel)* (3.75%), 11) Mulberry *(theihmu)* (3.75%), 12) Passion fruit *(sapthei)* (3.75%), 13) Betel nut *(kuhva)* (2.50%), 14) Coffee (2.50%), 15) Jackfruit *(lamkhuang)* (2.50%), 16) Rubber (2.50%), 17) Teak (2.50%), 18) Peach *(theite)* (2.50%), 19) Tall tree *(thingthupui)*

(2.50%), 20) Gooseberry *(sunhlu)* (1.25%), 21) Wild orange *(hatkora)* (1.25%), 22) Papaya *(thingfanghma)* (1.25%), 23) Strawberry (1.25%), 24) Sugarcane *(fu)* (1.25%) and 25) Tamarind *(tengtere)* (1.25%).

The jhum crops cultivated by the respondent households include 1) Bird's eye chilli *(zo chilli)* (78.75%), 2) Rice *(buh)* (76.25%), 3) Brinjal *(bawkbawn)* (71.25%), 4) Cowpea *(behlawi)* (61.25%), 5) Pumpkin *(mai)* (61.25%), 6) Bitter tomato *(samtawk)* (53.75%), 7) Yam *(bal)* (47.50%), 8) Maize *(vaimim)* (45%), 9) Ginger *(sawhthing)* (41.25%), 10) Sour tea *(anthur)* (33.75%), 11) Ash gourd *(maipawl)* (26.25%), 12) Cucumber *(fanghma)* (25%), 13) Green chilli *(hmarchapui)* (25%), 14) Sesamum *(chhawhchhi)* (22.50%), 15) Bitter gourd *(changkha)* (21.25%), 16) Mustard *(antam)* (17.50%), 17) Lady's finger *(bawrhsaia be)* (13.75%), 18) Snake gourd *(berual)* (12.50%), 19) Summer mint *(lengser)* (7.50%), 20) Celery *(pardi)* (7.50%), 21) American basil *(runhmui)* (7.50%), 22) Toothache plant *(ankasa)* (6.25%), 23) Bean (5%), 24) Rajmah (5%), 25) Watermelon *(dawnfawh)* (5%), 26) Soyabean *(bekang)* (3.75%), 27) hyacinth bean *(bepui)* (3.75%), 28) Coriander *(dhania)* (3.75%), 29) Potato *(alu)* (3.75%), 30) Sweet potato *(kawlbahra)* (2.50%), 31) Cabbage *(zikhlum)* (2.50%) , 32) Cape yellowwood *(chingit)* (2.50%), 33) Mask melon *(hmazil)* (2.50%), 34) Spine gourd *(maitamtawk)* (2.50%), 35) Coco yam *(baibing)* (1.25%), 36) Pigeon pea *(behliang)* (1.25%), 37) Capsicum (1.25%), 38) Mulberry *(theihmu)* (1.25%) and 39) Tobacco *(vaihlo)* (1.25%).

The fallow period followed by the respondents on average was 9.16 years ranging from minimum of 3 years to maximum of 15 years. It was noted that more than half (52.5%) of the respondent's household followed 10-15 years of fallow period.

The data on allotment of jhum sites reveal that land allotment of jhum sites for 22.5 percent of the respondents was given in September which is followed by clearing forest/cutting trees performed in the month of January by majorities of the respondents (68.75%). The drying period on average was 64.25 days ranging from minimum of 30 days and maximum of 150 days. The duration of drying period was 30-60 days which was followed by majorities of the respondents with 42.5 percent. Burning of jhum plots mostly took place in the month of March (98.75%) and the duration of burning in most (67.50%) cases lasted for '1 – 2 hours' .

It was also identified that majority (77.50%) of the respondents performed three rounds of weeding in a year or one jhum cycle. The respondents performed their first round of weeding during April to June wherein half (50%) of them performed weeding in May. The second round of weeding was starting from May to August whereby most (51.25%) of them had to perform the weeding in July. In the third round of weeding, the highest number (45%) of respondents carried out in August. The fourth round of weeding was not required for most (83.75%) of the respondents while it was required only for lesser number (16.25%) of respondents. The respondents who performed their fourth round of weeding in October accounted for 7.50 percent.

Harvesting period starts initially from the month of May. The early crops such as brinjal and pumpkin are ready for harvest by May and crops like bitter tomato maize, sour tea, cowpea, bitter gourd are ready for harvest by June. The later crops like yam, bird's eye chilli, and green chilli are ready for harvest by July and August. Jhum rice is ready for harvest by October while ginger is ready for harvest by January of the succeeding year.

It was observed that rice was cultivated by 76.25 percent of the respondents and the quantity of rice sown on average was 2.16 tin out of which the quantity of

harvest on average was 84.29 tin. The quantity of brinjal seed sown by 71.25 percent of the respondents on average was 312.5 gms from which they could harvested 83.52 kgs on average. Cowpea was cultivated by 61.25 percent respondents with average of 375 gms sown where they could harvest 62.85 bundles on average. The respondents who cultivated maize accounted for 45 percent. Out of the 15.44 cobs of maize sown they could harvest an average of 87.22 kgs of maize. Ginger was cultivated by 41.25 percent of the respondents. Out of the 302.90 kgs of ginger sown the harvest on average was 1450.60 kgs. A quarter (25%) of the respondents cultivated green chilli and they were able to harvest 55.50 kgs on average out of the 3.42 kgs of green chilli sown.

Majority (63.75%) of the respondents had to transport their crops by means of headload and there were some respondents who transported their crops by means of hired vehicles with 23.75 percent. The respondents who transported their crops by means of headload and hired vehicle accounted for 10 percent while the rest of only 2.50 percent transported their crops using private vehicle.

Large majority (82.50%) of the respondents transported directly from farm to home while few (11.25%) respondents transported first to roadside and then to home and the rest (6.25%) transported their crops directly market, mostly to Aizawl market.

The average distance covered by 69 (86.25%) respondents through headload was 3.75 kms with a range from 0.50 km to 14 kms. The data on distance covered by hired vehicle show that 21 (26.25%) respondents who had to transport their crops usually covered an average distance of 13.24 kms ranging from a minimum of 1 km and maximum of 60 kms. The average cost of hiring vehicle incurred one jhum cycle by respondents for transporting the crops on average was Rs 916.13 ranging from a

minimum cost of Rs. 20/- and a maximum of Rs. 2,000 which shows wide variation in the cost of hiring vehicles.

The crops processed by comparatively larger number of respondents include cowpea leave (behlawi) (41.25%), bird's eye chilli (40%), sour tea (anthur) (31.25%), bitter tomato (17.70%), yam (leave) (17.70%) and brinjal (15%).

The crops marketed by comparatively larger number of the respondents include bird's eye chilli (43.75%), brinjal (35%), pumpkin (26.25%), yam (leave) (22.50%), cow pea (20%), maize (20%), bitter tomato (17.50%) and sesamum (15%).

Large majority (88.75%) of the respondents brought their crops from jhum to home the villagers would come and buy the crops at home itself. There were 7.50 percent respondents who sold their crops directly from farm to Aizawl market while those who sold their crops in the local/village market accounted for 3.75 percent.

The overall mandays engaged in various stages of jhum cultivation on average was 192 mandays, Looking at the data on different activities, weeding required highest mandays with an average of 79 mandays followed by harvesting which required an average of 50.86 mandays and sowing with an average of 23.31 mandays while activity which required least mandays was burning with an average of 1.3 mandays.

It was noted that 38.75 percent of the respondents engaged hired labours for clearing forest while 16.25 percent engaged hired labours for reburning. About one-third (33.75%) of the respondents engaged hired labours for weeding while 31.25 percent had to hire labours for harvesting the crops.

Moreover, the respondents were also engaged in livestock rearing whereby majority (52.50%) of them took up piggery while 43.80 percent of them took up

poultry. Few respondents were also engaged in goat and cattle farming with 6.20 percent and 3.80 percent respectively.

The activities under forest resource based livelihoods include collection/processing/marketing of Bamboo Shoots *(Rawtuai)* with 17.50 percent, Crabs *(Chakai)* with 11.20 percent, Broomsticks with 7.50, *Amomumdealbatum (Aidu)* with 5 percent, *Caryotaurens (Tum)* (3.80%), Wild Banana Blossom *(Tumbu)* with 3.60 percent, Rattan *(Hruipuizik)* with 2.50 percent, Seweg *(Telhawng)* with 2.50 percent, Freshwater Snail *(Chengkawl)* with 1.20 percent, Honey with 1.20 and Fishing with 1.20 percent.

It was further noted that 6.20 percent of the respondents were in government service. Among the rest, 5 percent of them engaged in carpentry while 3.80 percent were engaged in petty shop and only 1 (1.20%) was engaged in fishery activities.

Gender roles in shifting cultivation and other livelihood activities

The involvement of males in activities under shifting cultivation as a whole was rated 'moderately high' while the involvement of females was rated 'moderate' which indicate that the involvement of males was higher over females in the overall shifting cultivation activities. The involvement of males was found to be more with the ratings of 'high' and 'moderately high' for site selection and land preparation. The level of involvement for males and females in production and harvesting activities was with a rating of 'moderate'. Moreover, male's and female's involvement were with the ratings of 'moderate' and 'moderately high' when it comes to post-harvest activities under the shifting cultivation.

The involvement of males and females in household chores was with the ratings of 'moderate' and 'moderately high'. It was identified that majorities of the households (52.5 %) engaged in livestock farming in which male and female

involvement was with the ratings of ‘moderate’ and ‘moderately low’ respectively. The result on gender roles in forest resource-based livelihood activities indicate that male’s involvement was with a rating of ‘moderate’ and females with a rating of ‘moderately low.’ It was also further determined that the households are also engaged in other livelihood activities such as carpentry, petty shop and maintenance of fishpond in which the involvement of males and females was with the ratings of ‘moderately high’ and ‘low’ respectively.

In the test for difference of means, significant difference on average performances of male and female was observed for site selection and land preparation. The t-statistic was significant at all level for the various classification of attending meeting, selecting sites, marking jhum boundaries, clearing forest, preparation of firelines, firing, refiring and construction of jhum hut. It was observed that t-test was significant at all levels for post-harvest activities on shifting cultivation such as processing/preserving crops, preserving seeds, bundling and selling/marketing.

The t-test show significant difference on the overall average involvement of male and female in household activities. Moreover, significant differences at all level was observed in the activities for cooking, washing clothes, cleaning utensils, household cleaning, caring for children, vegetable shopping, fetching water and financial management.

From the findings of the study the constraints faced by genders in performing the livelihood activities under shifting cultivation were identified which include i) labour intensiveness, ii) participation in decision making, iii) lack or poor farm connectivity, iv) capacity building and skill development, and v) overburdening of women with other livelihood activities and household chores.

4. Recommendations

Based on the findings of the study, the following recommendations are offered:

1) Shifting cultivation is labour intensive, systematic, traditional and periodic. Shifting cultivation on the other hand is said to have adversely effect on the environment as it deteriorates the ecological balance of nature and pollutes the environment. However, it is still practiced by the indigenous communities as there is no other option for better livelihoods. The lack for alternative livelihood activities compelled the rural farmers in Mizoram to pursue shifting cultivation despite the claimed unfavourable impact on the environment. Hence, the need for improving the practice of shifting cultivation by introducing sustainable method of farming through cooperating the traditional and modern techniques of cultivation without deteriorating the ecological balance of nature is the need of an hour. Therefore, increase in production and improve in quality should be the primary focus on the technique since economically backward households i.e. Priority Households (PHH) comprised of the highest number of percentages among the respondent's households who solely depends on cultivation for their subsistence.

2) The number of households engaged in livestock farming particularly in piggery and poultry accounts for the highest percentage among the respondents. Therefore, promotion of livestock farming among the shifting cultivators will further enhance the livelihood security of the rural households practicing shifting cultivation. The respondents were also engaged in forest resources-based livelihood activities by collecting non timber produces. Policy measures for sustainable way of forest resources management with

active participation of communities are recommended to ensure sustainable forest resource-based livelihoods for the rural households.

3) In the course of interaction with the respondents during field investigation, wage employment programme particularly of Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) was found to be one major source of household income for the shifting cultivators during the lean period. More of such wage employment schemes may be introduced along with other development programmes in rural areas for the enhancement of rural livelihoods.
4) With regards to the data on market channel it was observed that large majority of the respondents brought their crops from jhum to home where the villagers would come and buy the crops. There were also respondents who took their crops directly from farm to urban and local/village markets whereby each of them would find their own way of marketing the jhum crops. It is desirable that the shifting cultivators are properly organized in their respective villages so that they can have proper market channels with technical guidance from government departments and other development institutions. This will enhance the livelihoods of shifting cultivators and prevent them from unnecessary intervention of middle and price fluctuation
5) Observation was also made during the study that there are some who practiced permanent farming along with shifting cultivation. Such permanent farming practice may be encouraged with supports in terms good quality cash crops, horticulture crops as well as indigenous crops having good market potential.
6) Most respondents had to transport their crops by means of headloads directly from farm to home covering an average distance of 3.75 km and by hired

vehicles covering an average distance of 13.24 km. Because of lack of or poor road connectivity, the shifting cultivators have to put much of their times, energy and money. It even causes more hardship to women farmers. This calls for better road connectivity as utmost importance in enhancing the livelihoods of shifting cultivators. Better road and transportation facilities connecting jhum lands will surely enhance the livelihoods of shifting cultivators.

7) With regards to the data on educational qualification of the respondents, there were few among the respondents still illiterate despite the advancement of time and technology. This issue on literacy in rural areas needs a relook so that appropriate measures are taken to improve the overall quality of life among the rural farmers through education.

8) The involvement of women could be observed in all the stages of shifting cultivation starting from site selection and land preparation to post-harvest. Their level of involvement in post-harvest activities was even significantly higher over that of men. Hence, the contribution of women in shifting cultivation in the context of Mizoram is worth noting. However, the level of involvement of males was higher in activities related to decision-making, particularly in site selection and land preparation. This calls for policy measures to relook into the welfare of women particularly with focus to recognition of their contributions towards household economy, enhancement of knowledge and skills, and overall empowerment so they can actively participate in decision making process which will eventually bring quality of life among women.

9) The study on 'Gender Roles in Livelihood Activities under Shifting Cultivation System in Mizoram' focused on limited aspects of gender roles. Further studies on gender roles covering different aspects in the context of Mizoram are recommended. The suggested studies may include gender roles in household decision-making, gender roles in community development, and gender roles in skill development etc.

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