A STUDY OF THE EFFECTS OF SHIFTING CULTIVATION ON SOCIO-ECONOMIC LIFE OF THE JHUMIAS IN LAWNGTLAI DISTRICT OF MIZORAM

A Dissertation submitted to in partial fulfillment for the award of the degree of

Master of Philosophy in Economics

By

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DECLARATION

I, Juliet F Lalzarzoliani, hereby declare that the subject matter of this dissertation is the record work done by me and that the contents of this dissertation did not form basis of the award of any previous degree to me or to anybody else, and that this work has not been submitted by me for any other degree in other University or Institute.

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TO WHOM IT MAY CONCERN

This is to certify that Miss Juliet F Lalzarzoliani has worked under my supervision and guidance on a research topic entitled**, "*A Study of the Effects of Shifting Cultivation on Socio-Economic Life of the Jhumias in Lawngtlai District of Mizoram*"** for the degree of Master of Philosophy in Economics, Mizoram University, Aizawl. The work embodies a record of original investigations and no part of it has been submitted for any other degree in other universities.

Date: ……

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Date…… (JULIET F LALZARZOLIANI)

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ABBREVIATIONS

GoM : Government of Mizoram

NABARD : National Bank for Agriculture and Rural Development

NGEGS : National Rural Employment Guarantee Scheme

NLUP : New Land Use Policy.

NREGA : National Rural Employment Guarantee Act.

Ha : Hectare

HYV : High Yielding Varieties

Kg : Kilogram

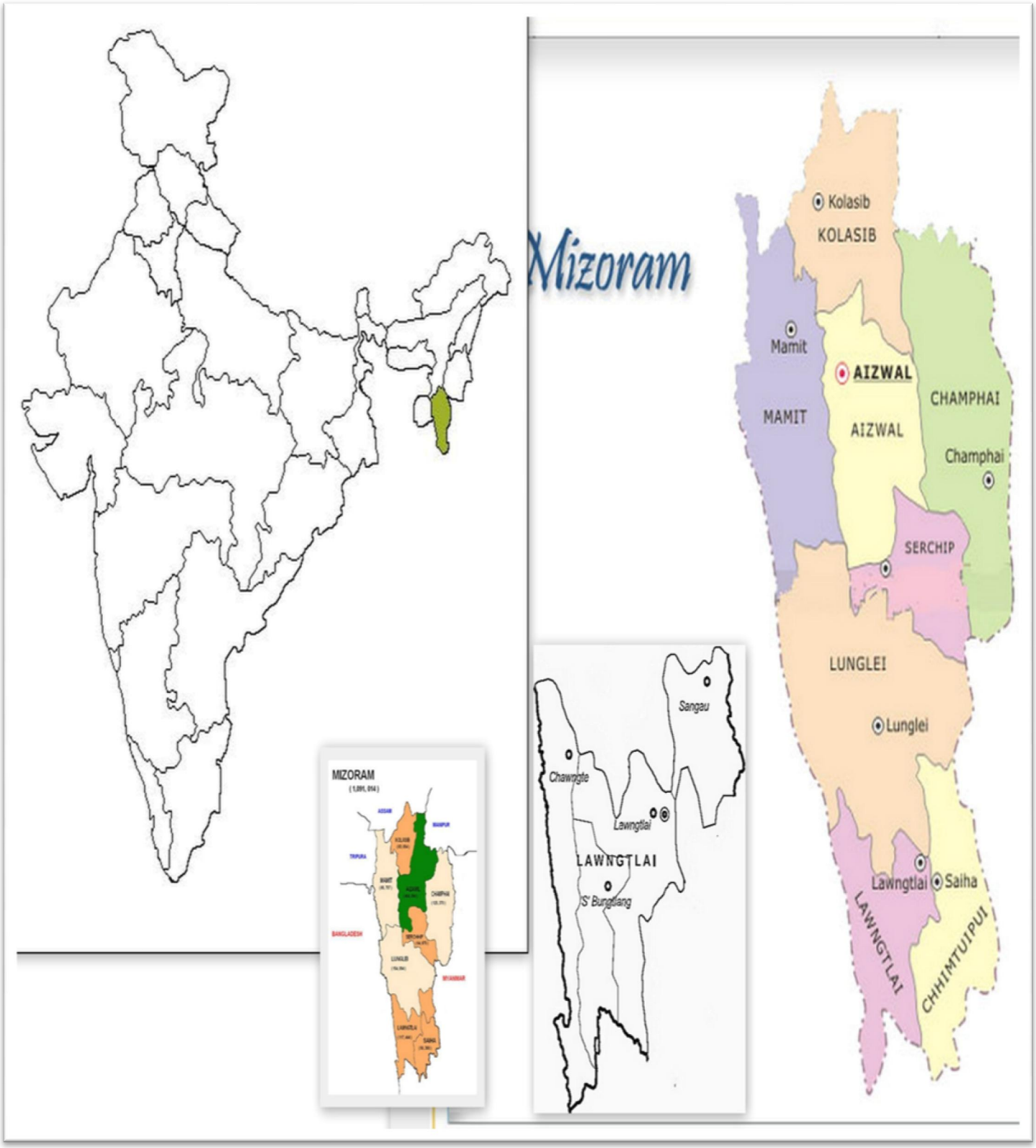
RD Block : Rural Development Block

Rs : Rupees

Sq : Square.

VC : Village Council

WRC : Wet Rice Cultivation



A1.1: Map of the study area, Lawngtlai District of Mizoram

CHAPTER 1

INTRODUCTION

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

Shifting Cultivation is an age-old agriculture system, which was practiced throughout much of the world. It was one of the very first forms of agriculture practiced by humans. It is the most primitive method of cultivation and its evolution is supposed to take place during the Neolithic period.[1] On an international scale, the system still constitutes the basis for the livelihood of an estimated 300-500 million people in Central Africa, South America, Oceania, and Southeast Asia. Moreover it is practised on about 30 per cent of all cultivable land but providing food to only 8 per cent of the world population. It is furthermore called slash and burn or swidden which is still practiced in many parts of the world by several ethnic groups and tribal communities. Shifting cultivation has been defined as any agricultural system in which fields are cleared by firing and are crop discontinuously[2].

It is mainly practiced in humid tropical areas of South East Asia, Africa and Latin America. This form of agriculture is used especially in tropical Africa in which an area of ground is cleared of vegetation and cultivated for a few years and then abandoned for a new area until its fertility has been naturally restored. In India, it is mostly practiced in the hill regions of the North-Eastern States of Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. It is also practiced in Bihar, Orissa, Madhya Pradesh, Chhattisgarh Andhra Pradesh and Karnataka of India.

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[1] Das, Girindra Nath. (2001): *Swidden Cultivation and the development programmes in North-East India.*

[2] Conklin, H. (1957): *Hanunoo agriculture, report on an integral system of shifting cultivation in the Philippines.*

Under shifting cultivation plots of land are cultivated temporarily, and then abandoned. Some parts of forests are cleared by falling trees and bamboos and by burning them. Then these cleared forests are used for cultivation of crops and vegetables. According to this practice, a plot of land is meant for a certain period of time because the cultivation of the same plot of land will yield lesser quantity as the natural fertility washed off with a span of time unless chemical is used. In this process, it is inevitable to shift from one place to another so as to yield a reasonable quantity. The time gap between leaving of the first plot of land and coming back to it again is called as 'Jhum Cycles' .The duration of the Cycles depend upon the land-man ratio. Since land is considered as fixed, the jhum cycle will be determined by the size of the population. The major inputs of jhum cultivation are seeds, organic manure and man power. The tools and implements which are used for such various operations are very simple and primitive. In accordance with its mode of operation, Jhum cultivation is known under different names in different area.

1.2 CONCEPT OF SHIFTING AGRICULTURE

Shifting cultivation is the type of cultivation in which trees are cut and land is clear for cultivation. Besides the uprooted trees are burns and mix their ashes in the soil to keep it fertile. The land-clearing system of shifting cultivation is the slash-and-burn method, which leaves only stumps and large trees in the field after the standing vegetation has been cut down and burned, as its ashes enriching the soil. After cultivation and harvesting they move on to other land and the same process is repeated. It is a farming system in which a piece of land is used, only to abandon or alter the initial use a short time later.

Conklin[2] defines shifting cultivation implies an aimless, unplanned nomadic movement or an abrupt change in location, either of which may refer to the cropping areas, the agriculturists, or both.

Warner[3] classified shifting cultivation into two types: (1) part time or partial shifting cultivation and (2) full time or integral shifting cultivation. In part-time shifting cultivation or sometimes called as supplemental shifting cultivation, it has been done in both upland and highlands but mostly at the foot of mountains, with a lack experience and lack of knowledge of sustainable agriculture. Full time shifting cultivation has been recognized as a major of occupation. The shifting cultivators rely on it for their livelihood.

Linkham [4] stated that shifting cultivation is a farming system where farmers move on from one place to another when the land becomes exhausted. The most common form is slash-and –burn agriculture: land is cleared by burning, so that

[3] Warner, Katherine. (1991) *Shifting Cultivators: Local Technical Knowledge and Natural Resource Management in the Humid Tropics.*
[4] Linkham, Anan *et.al* (2006) *Food Security of Shifting Cultivation Systems: Case Studies from Luang Prabang and Oudomxay Provinces, Lao PDR*

crops can be grown. After a few years, soil fertility is reduced and the land is abandoned. A new area is cleared while the old land recovers its fertility.

Shifting Cultivation or Jhum Cultivation as it is more commonly known in India is an agricultural system which is characterised by a rotation of field rather than of crops, by short period of cropping alternating with long fallow periods and by clearing by means of slash and burns[5] .

It is commonly known as "swidden" or "slash-and-burn" agriculture, therefore the distinctions can be made between the terms shifting cultivation and slash-and-burn agriculture. Traditional shifting cultivation refers to systems with long fallow periods allowing for forest regeneration, while slash-and-burn agriculture more generally refers to farming practices in which cutting and burning the forest involved. Slash-and-burn agriculture may or may not involve long fallow periods, and can be characterized as either large-scale or small-scale[6].

In rotation or established shifting cultivation system, it is normally done in secondary forests for 1-2 years, and then, cultivation moves to other places which have long been fallowed, and then, moves back to the same plots later. Farmers in this cultivation type do not need to move the whole village. This system is not harmful to the ecology or environment, but has a serious impact on the economy. In abandonment or pioneer shifting cultivation, it usually involves non-permanent villages that move into areas of primary forest and cultivated field intensively for a longer period, perhaps 10-15 years, fertility permitting or until most of the nutrients are severely depleted. In this case, fields and village sites are abandoned and moved to a new location in another area of primary forest. Typically, the loss of soil fertility

[5] Sachchindananda. (1988): *Tradition and development in Arunachal Pradesh. pp 53-62*
[6] Sánchez, *et.al* (2005) Alternatives to slash and burn: Challenge and approaches of an international consortium. *In Slash-and-burn agriculture: The search for alternatives*.

and the intensity of cultivation greatly inhibit the natural process of the re-vegetation and succession, even after years of abandonment[7].

1.3 PROBLEM STATEMENT

The problem statement focuses on the seriousness of deforestation in Mizoram and the inputs in shifting cultivation.

1.3.1 The seriousness of deforestation in Mizoram.

The State Environment & Forest Minister H Rohluna at a function on the World Forestry Day, 2014 states that even though Mizoram is supposed to have large area of dense forest given the small population and forest reserve, 'very dense forest' constitutes just 0.64 per cent of the total geographical area. He stressed on the need for saving Mizoram's green forest from rapid deforestation. About 90 per cent of the total population of Mizoram - 109104 have agriculture as their main source of livelihood. Nearly hundred per cent of these farmers are still practicing the tradition slash-and-burn method of cultivation.

It is estimated that about 1200 hectares of green forest in Mizoram is lost to jhum fires annually. In Northeast states, Arunachal Pradesh tops in protection of forest, Mizoram ranked tenth position. According to a recent survey by the Mizoram remote sensing application centre, there is only 3158.57 sq km of dense forest in Mizoram which is not yet touched (cultivated). This accounts for 14.98% of the total Mizoram area.

[7] FAO. (1984). *Changes in shifting cultivation in Africa*.

The Centre has recently adopted satellite imagery to deal with bush fires in Mizoram. According to forest department sources, satellite imaging will be used to spot the wildfires and then adopt measures to prevent their spread. According to fire department records, 288 fire incidents took place during last year in which seven persons, including two farmers, were killed. The damaged properties were estimated to be worth Rs 17.13 core[8].

13.2 INPUTS OF SHIFTING CULTIVATION

Productivity: The output per unit area is low and usually only enough to feed the farmer's family. Besides a small variety of crops are grown. Output is usually only sufficient for survival. The productivity is declining. According to elderly farmers, the variety and growth of the natural vegetation is gradually declining after each cycle of cultivation.

Labour: Much work is required in the clearing and burning of trees and undergrowth, as well as in the sowing of seeds. Family members usually provide the labour for this kind of agriculture. Thus, it required many labour during the weeding stages of Hnuhpui, Hnuhhram and Pawhchhiat, also in the harvesting period.

Capital: Hardly any capital is required for shifting cultivation. The farmers use simple tools such as machetes, sickles, axes and sticks. The adoption of new higher yielding crop, the exchanging of a digging stick for a hoe, or a hoe for a plough, or the development of irrigation systems, fertilizers for improving yield etc didn't take place as it is still carry on with its present capital inputs.

[8] Deforestation rings alarm bell in Mizoram from webindia123.(http://news.webindia 123.com)

Land: Even though a small plot of land is cultivated each time, shifting cultivation takes up large areas of forest land because farmers move on to another plot of land every year. It has become a big issue concerned for the environmentalist that green forest has been decreasing at an alarming rate in Mizoram. The culprit behind this rapid deforestation tends to be shifting cultivation. About 60% of the population depends upon agriculture and allied sector[9]. Because about 32 % of the cultivated area is under Jhum cultivation, involving of cutting down trees and burning them, forest fire etc.

Therefore, agriculture in Mizoram is crop oriented and emphasis is on food crops. Mix cropping is a very common practice with jhum cultivation and crop rotation is an important aspect of agriculture in order to preserve soil fertility. In the hilly areas of Mizoram, it is characterized by pre-dominants of shifting cultivation which requires only small initial investment.

The population pressure, communities wanting to grow more food have cleared greater chunks of forest lands and returned to the fallow plots much sooner than 10-20 years. The length of the fallow phase between two successive cropping phases has come down to even two to three years in some places. This has resulted in soil degradation; fall in yield, lower returns, and reduction in green cover. The emphasis should be on controlling distortions or retrogressive developments rather than on controlling shifting agriculture itself.

The long term impact on economy will be still more disastrous owing to destruction of rain forest of 1.5 lakhs acres of land every year, heavy soil erosion and resultant ecological imbalance which in turn effect the economics of the practice on employment, productivity etc.

[9] Economic Survey Mizoram 2011-2012

1.4 RATIONALE

Shifting cultivation has commonly been attacked in theory because it causes soil erosion, deforestation, soil degradation and environmental pollution etc. The popular view which is also the official view, frowns shifting cultivation as a primitive agriculture practice and inferior method of land use[10]. In Mizoram, the cultivation of crops under jhuming marked to be both Primitive and uneconomical which result in an extremely low production of agriculture output. Therefore, it tends to provide only for the survival of the farmers. This led to the vicious cycle.

The Central and State Government has planned development schemes to motivate jhumias to adopt settled cultivation due to the adverse effect caused by Jhum cultivation. However has not been successful in dealing with jhum systems nor in coming up with solutions so far. There is a need to empower local communities to participate more fully in problem judgment and in generating innovations for more sustainable agro ecosystem productivity and in due course to manage their own resource base.

In contrast shifting cultivation is an integrated farming system involving forestry, agriculture and strong social organisation on the part of the communities. So far Mizoram is at the infant stage of agriculture it is needed to find out the most beneficial and maximum possible productivity per hectare. For that reason, it is an emergent issue to improve the present practices. As jhuming is best suited for Mizoram in respect of climatic conditions, man power and technical availability, we must carefully conduct a systematic investigation in order to improve the present

[10] Maithani.B.P. (2005). *Shifting Cultivation in North-east India*.

system. We must improve the agricultural methods because agriculture is the only employment for the mass of the rural population.

The outcome of the study will be useful for development of the condition of the Jhumias, also encourage other scholars to do more researches on similar hidden issues of the underdeveloped practice of traditional agriculture. It may help to evolve a framework for analyzing the impact of jhum cultivation so as in sustainable development etc.

All the mentioned points from the rationale form the selected objectives of the study.

1.5 SCOPE OF THE STUDY AND ITS LIMITATIONS

The study examines the present socio-economic condition of the Jhumias in Lawngtlai District of Mizoram. It further reviewed the status and problems of shifting cultivation practice in the district. It focussed on the employment and productivity under shifting cultivation. The study looked at issues that needed to be addressed by the government before undertaking large-scale field interventions aimed at phasing out shifting cultivation

In case of primary data, it is very difficult to get information on fertilizer and pesticide use on a specific hill for crop production. We cannot get the fertilizer type use by the jhumias as none of them keep account of the type in particular. Moreover, the study on the root level practice on few conclusions cannot be generalised due to the differences in farm level practices from one region to another.

Therefore, the primary data collected may not exactly match with data available with government department. Market related data has been collected by conducting interviews. In view of frequent price fluctuations, market information presented in the report will have to be updated. State / district level data available from various secondary sources is inconsistent. Self-judgement guided by primary analysis was used to use the date.

1.6 OBJECTIVES OF THE STUDY

a) To examine the effects of jhum cultivation on the social life of the people.

b) To find out whether jhuming creates the required employment opportunities of the ever increasing population.

c) To examine the productivity of shifting cultivation.

d) To examine whether shifting cultivation is a viable method of cultivation.

1.7 HYPOTHESES

a) Jhum is not only an occupation but also a way of life for the people.

b) As a result of an ever increasing population there has been an increasing under-employment.

c) Shifting cultivation is operating under diminishing Return to scale.

d) Shifting cultivation is not a viable method of cultivation.

1.8 METHODOLOGY

1.8.1 Selection of the site

Lawngtlai District is selected because of the following reasons:

- The majority of the population are engaged in shifting cultivation.
- No studies or research have been conducted on this site in respect of the socio-economic condition of the jhumias.
- Mainly inhabited by ethnic minority people.

1.8.2 Data collection

Both primary and secondary data are used.

a. ***Primary data:*** The primary data were collected by a household survey using survey questionnaire and direct interviews. The data collected include:

- Information and data on shifting cultivation: Size of holdings, output, cultivation year, consumption requirement, output marketed, production of commercial crops and other allied sources etc. The pattern of human labour use for producing crops under jhum which consist of the price day labour, the details of labour category on cleaning & burning, Sowing and transplanting, weeding & fertilising, watching & guarding crop and harvesting & carrying.
- Data on information of credit received, whether beneficiaries of NLUP or any other Government programme.
- Data on the perception of farmers about jhum cultivation.
- Data on Socio-demographic characteristics: Family size, age structure of the household, working force of household, education level of family members, family income, family social status etc.

The personal communication and interviews with the village headmen, local authorities were also implemented in order to obtain the additional information and data on the traditional social life and shifting cultivation practice of in the study area.

b. Secondary Data

Mainly the following documents are consulted:

- The secondary data from Statistical Handbook of Mizoram published by the Directorate of economics & statistics Mizoram is used.
- The Statistical Abstract published by Directorate of Agriculture (crop Husbandry) Mizoram is used.
- The Economic Survey Mizoram published by Planning & Programme Implementation Department, Government of Mizoram is also used.
- The secondary data of village-wise beneficiaries of improved jhum is also collected from Agriculture Office Lawngtlai.
- Published and unpublished sources, magazines, Journals, website and other online resources etc.

c. Sample

The one hundred sixty five (167) villages of Lawngtlai District was classified under six circles (Lawngtlai, Sangau, Diltlang, Chawngte, Borapansuri and Damdep) according to geographical proximity. According to the list of Village-Wise Beneficiaries of Improved jhum from the Agriculture Office Lawngtlai, three circles were chosen for the study.

The first circle was Sangau. In this circle 90 samples were collect from Sangau-1, Sangau-2, Cheural, Pangkhua, Sentetfiang. The second circle was Diltlang. In this circle 100 samples were collected from Bungtlang 'S', M.Kawnpui. The third circle was Lawngtlai. In this circle 97 samples were collected from Rulkual, R.Vanhne, Paithar, Thingkah, Council Veng, Lawngtlai IV, Lawngtlai Vengpui, Mampui. The total sample collected was 287.

Accordingly, villages were chosen at random as all villages have similar climatic conditions. The cultivating households were selected by stratified random sampling: the factors were:-

1. Size of the Villages
2. Size of the Family
3. Size of Holdings
4. Number of workers in the Family

The Villages chosen were a portrait of the average conditions of the jhumias of all the Villages in Lawngtlai District. One of the most desirable properties of sampling is that the sample should be representative. The representative Villages selected should have a topography which depends on shifting cultivation. If the villages does not have any peculiarity in her geographical conditions of soil, rain and climatic, and they are very much uniform.

Yet another condition is that if the village is neither too near nor too remote from the roadside. Where distance from the road is concerned, there are three types of villages, viz, those which are at least distance from the roadside; those at a great distance from the road and those at a moderate distance. If the village is near the roadside it will have avenues of various occupations other than agriculture because it

will act as a nodal point for various activities. Hence such a village will not be able to give us reliable and complete data about agriculture. In the same way, if the village is remote from the roadside it will not be able to deal in any occupation not even proper agriculture. Such a village is usually very small. Therefore the village should be at a moderate from the roadside.

The Villages which were under observation were moderate villages in respect of remoteness, literacy and economic conditions.

d. ***Measure:***

The data thus collected were subjected to suitable statistical analysis to draw conclusions. The collected data has been analyzed and presented using a relevant statistical tool. Additionally, measures of central tendency, dispersion and correlation or descriptive statistics such as Frequency percentage distribution, mean and standard deviation is used wherever applicable.

1.9 BRIEF DESCRIPTION OF THE STUDY AREA

Lawngtlai District is one of the eight administrative districts in Mizoram. The District was created on 11th November 1998**.** Prior to 1998, Lawngtlai District was a part of undivided Chhimtuipui District comprising of Saiha and Lawngtlai.

- ***Location:*** The District is located in the South West part of Mizoram having international boundaries with Bangladesh in the west and Myanmar in the east. Lunglei and Saiha District bounded the district in the north and in the south respectively between The Districts shares common boundaries with Lunglei and Saiha District in the north and south respectively. Lawngtlai District covered an area of 2557 Sq.km and it lays 92.30^0– 93^0E Longitudes and 21.85^0 – 22.60^0N latitudes having international boundaries with Bangladesh in the west and Myanmar in the east. The District headquarters – Lawngtlai is connected by National Highway No.54 and it is about 296 Kms from the Aizawl.
- ***Demographic Profile:*** According to the 2011 census Lawngtlai district has a population of 117,444.The district has a population density of 46 inhabitants per square kilometre (120/sq m). Its population growth rate over the decade 2001-2011 was 59.53%. Lawngtlai has a sex ratio of 945 females for every 1000 males, and a literacy rate of 66.41 % (Lowest in the state)[11].

[11] Lawngtlai District from Census2011. (www.census2011.co.in)

Table-3.1: Demography of Lawngtlai District

SL.no	Particulars	Lawngtlai
1	Total population	1,17,444
2	Male	60,379
3	Female	57,065
4	Sex Ratio	945
5	Density (2011)	46
6	% decadal growth rate of population	34.08

Source: Statistical Handbook of Mizoram 2010

- ***Socio-cultural background:*** The main communities inhabiting Lawngtlai District are the *Lai, Chakma , Bawm, Pang etc.* These are famous cultural heritage among such tribes. In the eastern side of the district where Lai communities are the main inhabitants, *Chawnglaizawn, Sarlamkai and Pawhlohtlawh* are the main cultural dances. In Chakma occupied area of the district, there are various tribes of backward classes. In these areas, the main religion is Buddhism whereas in the eastern side i.e. Lai occupied area; Christianity is prevailing as the major religion. The common languages speaks in the district are Lai, Chakma and various dialects of other backward tribes i.e Pang, Bru, Bawm etc. These communities have different folk dances, habits and customs of their own. The common cultural dances of the Chakma are Nua Jhumo Naach and Biju Naach. The inhabitants of Lawngtlai District are very backward in various ways, the standard of living is very low and literacy per centage of the district is also the lowest amongst the eight districts in Mizoram[12].

[12] Lawngtlai district. From Agriculture Department (Crop Husbandry) (http://agriculturemizoram.nic.in/downloads.html)

- ***Climatic Condition*:** Lawngtlai district has a moderate climate. In general, it is cool in summer and not very cold in winter. In winter the temperature varies from 8 °C to 24 °C and in summer, the temperature varies between 18 °C and 32 °C. The western part of the district has less elevation comparing to the eastern part, and hence it experiences a little warmer climate than the eastern part. Relative humidity is highest during the south-west monsoon when it reaches to about 85%. The district is under the direct influence of south-west monsoon and heavy precipitation is usually received from May to September every year. The average annual rainfall is about 2558 mm. The hottest period is from March to August every year. During the rainy season, it remains heavily clouded. There is an increase of cloudiness from March onwards. A clear and cool weather starts appearing from September and remains till January the next year[3.]

- ***Occupation**:* One-third of the total inhabitants of Lawngtlai district rely entirely on agriculture, which is mostly based on traditional method of shifting cultivation. Only a small fraction of urban population is involved in permanent employment, such as state government service, bank and schools, and few engaged in small-scale business. The economic status of the district is in fact the lowest among the districts in Mizoram[13].Especially people, living in the district headquarters (Lawngtlai) are also engaged in various services in Government, business particularly in Autonomous District councils.

[13] Rashtriya Sam Vikas Yojana Project, Lawngtlai District. *http://lawngtlai.nic.in/ RSVP/profile.html*

Table-1.1: MONTHLY RAINFALL OF LAWNGTLAI DISTRICT (In mm)

Sl.no	1	2	3	4	5
Year	2007	2008	2009	2010	2011
Jan	NIL	121	NIL	NIL	D
Feb	35	18.5	NIL	NIL	D
Mar	18	12	12	NIL	D
Apr	86	NIL	123.2	33	D
May	423	162	181	261.4	D
Jun	519.5	314.5	439.9	423.9	D
Jul	525.5	419.2	401	352.3	D
Aug	421.1	339.9	552.7	482.2	D
Sep	579.5	326.9	562.3	271.2	D
Oct	195.5	157.9	151	170.3	D
Nov	36	NIL	48.1	32	D
Dec	NIL	NIL	NIL	14.7	D
Total	2832.1	1871.6	2471.2	2041	O

Source: Agriculture Statistical Abstract 2011-2012

- ***District Administration:*** In comparison with other districts in Mizoram, Lawngtlai district has uniqueness and peculiarity. At present, there are two Autonomous District Councils within the district viz. The Lai Autonomous District Council (LADC) and The Chakma Autonomous District Council (CADC) functioning parallel with the District Administration machinery headed by Office of the Deputy Commissioner of Lawngtlai District with its headquarter at Lawngtlai. The councils have their Headquarters at Lawngtlai

and Kamalanagar respectively. Having separate autonomous legislative, executive and judicial functions, the Lai's and the Chakma's administer their respective autonomous regions in accordance with the provisions of the Sixth Schedule to the Constitution of India.

This district is divided into four Rural Development Blocks:

1) Lawngtlai Rural Development Block
2) Bungtlang 'South' Rural Development Block
3) Chawngte Rural Development Block
4) Sangau Rural Development Block.

The town of Lawngtlai is the headquarters for the district. The names of the headquarters of the Rural Development Blocks are same as to them. There are 158 villages in Lawngtlai district. There are 3 Legislative Assembly constituencies in this district, 36-Tuichawng (ST), 37-Lawngtlai West (ST) and 38-Lawngtlai East (ST).

Table- 1.2: BLOCK-WISE AREA AND POPULATION

Sl. No	Name of R.D Block	Area in sq ha	Population (2011 Census provisional)
1	Lawngtlai	77084	38420
2	Sangau Block	56591	16738
3	Chawngte Block	68635	45192
4	Bungtlang 'S'	53400	17094

Area Source: Remote Sensing G.I.S

- ***Flora and Fauna:*** Lawngtlai district is situated within the tropical belt. It usually received high annual rainfall during the month from May up to

September. In this region the tropical wet evergreen, mixed deciduous forest and wild banana forests are found. The western part of the region is covered by a thick virgin forest. Host of skima wallichi, Banyan tree, Gulmohar tree, Gamari, Jarus, Champa and several kinds of bamboos, climbers of different kinds and many kinds of wild fruits are found in this area. Several kinds of plants and herbs which are good for making herbal medicines are also found in this district. In 1997 Lawngtlai district became home to the Ngengpui Wildlife Sanctuary, which has an area of 110 $km^{2.}$

- ***Effective non-Governmental Organisations:*** The district has a number of non-governmental organizations actively involved towards developing socio-economic conditions of the people. Their activities range from promoting communal harmony, doing social work, giving awareness to people about several development programmes and co-operate with development agencies like DRDA in implementing various developmental programmes. They have branches all over the district and this in turn help in disseminating to the people the concept of organizational skills such as role of Presidents, Treasurer etc. This makes the effort to empower them a much easier task especially in encouraging micro finance through Self Help Group.
  Some of the prominent NGOs are Young Lai Association(YLA),established since 23rd September,1974, Lai Women Association (LWA) established in 1996, Young Chakma Association(YCA), Pang youth Association, Mizo Hmeichhe Insuihkhawm Pawl (MHIP) and Lai Student Association (LSA),established since 23rd April , 1958. YLA, the most popular NGO has about 90 branches across the district with about 19000 members. LWA has 43 branches with around 8000 members. Their active involvement in formulation

of district plan of RSVY is highly appreciated by the core members and they will play a crucial part in seeing the schemes yielding fruitful results. Their importance is well recognized by the inclusion of representative of Central Young Lai Association as one of the member of State Steering Committee on RSVY by the Government of Mizoram.

1.10 ORGANISATION OF THE STUDY

The dissertation is divided into the following chapters:

Chapter – I: Introduction

Chapter- II: Review of Literature

Chapter- III: Overview of Shifting Cultivation in Mizoram.

Chapter- IV: Effects of Shifting Cultivation on the social life of the Jhumias

Chapter- V: Nature and Employment and Productivity under Shifting Cultivation

Chapter- VI: Main Findings, Suggestions and Conclusions

Bibliography

Appendices

The study consists of five chapters. The first chapter states the background and concept of shifting cultivation. The problems and the reason for the topic selection also consist in this chapter. Besides the research objectives, methodology and hypothesis are also introduced in this chapter.

The second chapter reviews the theories and literature related to the research in support of the present study focusing on the objectives of the studies and hypothesis of the research. The literature review is distinguished in two sections one with the studies at international level and the latter with the studies in India and particularly North-east India.

The third chapter consists of the overview of shifting cultivation in Mizoram. This chapter contain a brief description of the status of shifting cultivation in Mizoram which will describe shifting cultivation as a primitive mode of agriculture practice till today. The status of shifting cultivation in Lawngtlai District is also discussed. The policies and programme related to shifting cultivation implemented by the state government will be discuss and ended with a conclusion of this chapter.

The fourth chapter deals with the effects of shifting cultivation on the social life of the jhumias and their present socio-economic condition at the study sites are stated and analyzed. The perception of the jhumias toward their jhuming practice is explained in details on this chapter. This chapter is based on primary data.

The fifth chapter focuses on the nature of employment and productivity under shifting cultivation. This chapter contain the estimation of output or the farm productivity. Therefore, the employment and output, size of holding and output is analyzed to prove the adopted hypotheses. The pattern of human labour use for producing crops under Jhum and the production of rice etc is also analyzed and studied

The last chapter finally gives you the results and findings, followed by the conclusion and suggestion.

A bibliography and appendices are added at the end.

Table-A1.2: Different Names of Shifting Cultivation: World

Name	Country
Caingin	Philippines
Chena	Caylon (Sri Lanka)
Chitmane/Citimane/Chitemene	Rhodesia, Tanzania, Zaire
Coamile	Mexico
Copocira system	Brazil
Fang	Congo
Hay	Laos
Hununoo	Philippines
Ichali	Guadalupe
Jumah/humah	Java, Indonesia
Kaingin/Caingin/Kaiyingan	Philippines
Kaden	Japan, Korea
Karen	Japan, Korea, Thailand
Kohoho	South-east Homen Island
Ladang	Indonesia/ Malaysia
Lougan	Ivory Coast
Masole	Zaire, Beigian Congo
Miao-nung/Miao-tien	China
Milpa	Central America, Mexico
Napa	Thailand
Padi Ladang	Seberida, Indonesia
Pene	Eastern New Guinea
Proka	Ghana
Rai	Thailand
Rastroya/Rastrojo Mounten	Brazil
Ray	Vietnam
Roca	Brazil
Shamba	Central Africa
Sartage	Belgian Ardennes
Tam-ray	Thailand
Tadang	Indonesia
Tenggala	Malaysia
Tsembaga	Papua new Guinea
Taungya/Toungya	Burma Hills
Uma	Phillipines (Manobo Tribal)
Yi	Burma
Zande	Africa

Source: Spencer (1996) and various other studies

Table- A1.3: Different Names of Shifting Cultivation: India

Name	Region(India)	Community
Adiabik	Arunachal Pradesh	
Beora	Jashpur, Chhatish Garha	Pahari Korwa
Bewar	Madhya Pradesh	Baiga
Bimra	Central India	
Cotu-cadu	Western Ghats	
Kulumbi	North Kanara, Karnataka	
Cumari/Kumari/Bharti	Western Ghats	
Dahia/Dhya/Dahya/Dahi/Daya	Central India, Maharastra	Baiga, Bhutia
Dale	Western Ghats	
Dulee	Central India	
Dippa/Deppa	Central India	Maria
Erka	Central India	
Guhad	Central india	
Hakkal	Western Ghats	
Hooknismong	Tripura	
Ijran/Kandala	Kumaon Himalaya	
Jara	Central India	
Jhimta	Eastern Gujarat	Bhil
Jhum/Jhoom/jum/joom/Zuhm	North-eastern India, Assam Hills	
Khallu	Bihar	
Khamori	Central India	
Khit/Katil	Himalaya	
Kumari/Kumeri/Kumri	Peninsular India	Gondulu, Male Kudia
Kurai	Bihar	
Kurao	Central East Coast-Eastern Ghats	
Lo	Mizoram	
Marhan	Central India	
Parka/Pharka	Central India	
Penda	Central India, Bastar	Maria
Pothy Podu	Andhra Pradesh	
Punam	Nilgiri Plateau, Western Ghats	
Rab	Western Ghats	
Tekonghi	Nagaland	
Waler	Gujarat	
Watra	South-east Rajasthan	

Source: Spencer (1996) and various other studies

Table-A1.4: SOME OF THE MAJOR ETHNIC GROUPS PRACTISING SHIFTING CULTIVATION IN INDIA

Sl.no	States	Major ethnic groups practicing shifting cultivation
1	Arunachal Pradesh	Aka, Miji, Bangro, Nishi, Bangni, Dafla, Adi, Miniyong, Padam, Miri, Mishmi, Tangsa, Singpho, Wancho, Nokte.
2	Assam	Garo, Naga, Khasi, Mizo, Kuki, Mikir (Karbi).
3	Manipur	Kuki, Naga (Tangkhul, Zeliangrong, Mao etc.) Hmar, Paite, Mizo
4	Meghalaya	Khasi, Garo, Jaintia, Biate/ Hmar.
5	Mizoram	Mizo, Kuki, Hmar, Lakher, Pawi, Chakma, Reang (Bru).
6	Nagaland	Angami, Ao, Sema, Lotha, Konyak, Rengma, Tangkhul, Chang, Yimchungur, Kuki.
7	Tripura	Tripuri, Jamatia, Kuki, Garo, Reang, Noatia, Lushai, Halam, Mag, Chakma
8	Andhra Pradesh	Kolam, Hill Reddi, Khond, Samantha, Savara, Koyas, Konda, Reddi, Porya.
9	Madhya Pradesh	Baiga, Madia/Maria, Gond, Mawasi, Pande, Majhwar, Korwa, Korku/Kodaku, Agaria, Pahari, Korwa, Manjhi, Bharia.
10	Orissa	Bhuiyan, Juang, Erenga Kol, Kondh, Kutia Khondh, Binjhia, Kamar, Saora, Jatapu, Paraja, Gadba, Koya, Bonda.

Source: R. K. Acharyya, et al (2010).

References:

Amalendu Jyotish. (2004). *Ecological, Economic and Institutional Aspects of Shifting Agriculture: A study in Orissa,* PhD Thesis, Institute for Social and Economic Change, Bangalore University, Bangalore.

Conklin, H. C. (1957). *Hanunóo Agriculture: A Report on an Integral System of Shifting Cultivation in the Philippines* (No. 12). Food and Agriculture Organization of the United Nations.Rome.

Das, Girindra Nath.(2001). *Swidden Cultivation and The Development programmes in North-East India.* New Delhi: Akansha Publishing House. pp.*4-5*

FAO. (1984). *Changes in shifting cultivation in Africa*. FAO Forestry Paper 50 Rome: FAO

Gupta, V. (2005). Jhum cultivation practices of the Bangnis (Nishis) of Arunachal Pradesh. *Indian J. Traditional Knowledge*, *4*(1), 47-56.

Linkham, Anan *et.al* (2006) *Food Security of Shifting Cultivation Systems: Case Studies from Luang Prabang and Oudomxay Provinces, Lao PDR*. Journal of Mountain Science 3(1):48-57. DOI: 10.1007/s11629-006-0048-2

Mahajan, V.S., (1990).*Mizoram's jhum revisited, In: Shifting Cultivation in North-East India,* Majumder, D.N., ed., New Delhi, Omsons Publications, pp.229-36.

R. K. Acharyya, et al (2010). *Shifting Cultivation: In Search of Alternatives.* Abhijeet Publications. pp 3

Sachchindananda. (1989). *Shifting Cultivation in India.* New Delhi: Concept Publishing. pp-8

Sánchez, P.A., C.A. Palm, S.A. Vosti, T.P. Tomich, and J. Kasyoki. (2005) Alternatives to slash and burn: Challenge andapproaches of an international consortium. In *Slash-and-burn agriculture: The search for alternatives*, edited by C.A. Palm,S.A. Vosti, P.A. Sanchez, and P.J. Ericksen. New York: Columbia University Press, pp 3-37.

Tawnenga. (1990).*Studies on Ecological Implication of Traditional and Innovative approaches to Shifting Cultivation in Mizoram*. PhD Thesis, North-Eastern Hill University, Shillong, India

Warner, Katherine. (1991) *Shifting Cultivators: Local Technical Knowledge and Natural Resource Management in the Humid Tropics.* Food and Agriculture Organization of the United Nations. University of Minnesota.

Web Reference

Webindia123.Deforestation rings alarm bell in Mizoram http://news.Webindia123.com/news/articles/India/20130319/2175168.html (Retrieved June 9th 2014)

CHAPTER 2

LITERATURE REVIEW

CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

The history of shifting cultivation in North-East India is as old as their culture per-se. Literatures on the deforestation, ecology, anthropology perspectives of shifting cultivation are available in plenty. But this chapter attempts to draw relevant literature in support of the present study focusing on the objectives of the studies and hypothesis of the research. The literature review will be distinguished in two sections one with the studies at international level and the latter with the studies in India and particularly North-east India, which are as follows:

2.2 STUDIES AT INTERNATIONAL LEVEL

Yoshito Takasaki (2011). mentions that although economists have made significant progress in modeling shifting cultivation over the last two decades, extant economic models neither clearly distinguish between primary and secondary forests nor address potential roles of on-farm soil conservation in shifting cultivation, where he differentiates shifting cultivation into two regimes. He states that developing a unified farm model of primary forest clearing, forest fallowing and on-farm soil conservation is needed to examine effective policies for protecting primary forest and maintaining sustainable secondary fallow forest. He also points to promising avenues for future modeling.

Sharma, D. P. (2011) article attempts to seek the understanding and perception of Chepang on the practices of khoriya cultivation. It tries to explain the relationship of Chepang people to their traditional khoriya land by assessing the socio-cultural and economic importance in their life. This study shows that shifting cultivation is best ecological and cultural adaptation to their natural environment of the Chepang. That is, Chepangs not only harvest grains from their *khoriya* but also pay great cultural and religious respect to it. He concludes that to understand culture, history and everyday life of the Chepang, knowing all about their traditional agricultural practice i.e. shifting cultivation is very significant. The observation shows that shifting farmers do not go to community and national forests for cultivation. They only shift to the lands where they have been doing agricultural activities for generations; that the Chepangs are facing shortage of land for the cultivation.

Aryal, K. P., et al. (2010) studies to enhance understanding on shifting cultivation practiced in Kangchenjunga Conservation Area (KCA).The main objective was to see how to manage the shifting cultivation practices in KCA to address both the conservation and sustainable development goals and what are the benefits in maintaining shifting cultivation practices as a land use. The findings of this study and past researches show that maintaining and improving shifting cultivation has many benefits to offer for its practitioners. It's highlighted that shifting cultivation is an indigenous knowledge practice doing by farmers since generations to manage natural resources and require recognitions in the policies of natural resources management mainly in the face of changing climate. Most shifting cultivators state that they are using the lands since generations and continue to use in future. Hence, development efforts should be aimed towards modifying and

improving the existing shifting cultivation system, rather than trying to convince farmers to replace it. They suggest that farmers lack technical support to improve their farming and resource management, which would be more effective than the current activities to discourage bhasme..

McCallie (2008) studies contributed to a set of case studies designed to investigate farmer-generated strategies for intensifying the fallow phase of shifting cultivation systems in upland Southeast Asia. He also documented an indigenously developed, managed fallow system in West Timor, Indonesia, based on *Tecoma stans L.* (Bignoniaceae), an invasive, fast-growing shrub. As farmers indicated that *T. stans* fallows rejuvenated soils for maize cropping within five years. Such that the fallows also produced fuel wood, light construction material, vegetable stakes, and some fodder for cattle. His findings indicated that the *T. stans* fallow served as both a more effective and a more productive fallow, based on Cairns' typology. It can be concluded that his framework and template were useful in guiding the study such that it addressed a diversity of biophysical, political, economic, and social factors. It facilitated the development of an integrated representation of the resources and constraints of small farmers so that informed intervention strategies could be developed.

M.A Monayem and S.M Fakhrul (2007) in their paper Shifting cultivation and its alternatives: Productivity, Risk and Discount Rates in Bangladesh evaluates the economic feasibility of replacing shifting cultivation with settled agriculture and new soil conservation technology based on an assessment of the farmers' risk and corresponding discount rates in the Khagrachari hill district of Bangladesh. The study found that the social discount rate is a crucial factor determining the switch from shifting cultivation to new soil conservation methods. The study concludes that

these problems can be overcome if financial support technical assistance is made available. The people in the uplands of eastern Bangladesh have been practicing shifting cultivation from time immemorial and it is closely related with their socio-cultural identity.

T.K. Nath et al (2005) in their studies of Shifting Cultivation (jhum) in the Chittagong Hill Tracts, Bangladesh examined the sustainability, Rural Livelihood and Policy Implications. The results of their input-output and income expenditure analyses reveal that the present jhum production pattern cannot be considered sustainable for the livelihood of tribal people. Firstly, they mention that, the present yields cannot feed the farmers all year, their findings, however, indicate that output is higher than the input value when they exclude the unpaid costs of household labour and exchange labour. Even though jhum yield was higher than input value, farmers face food shortages and have therefore adopted other occupations for sustenance. The second reason for unsustainability is mention that is because farmers cannot increase or even maintain the existing level of production because repeated cultivation has reduced the nutrient base of the soils, and top fertile soil has been eroded in every cultivating season

Fox, J., et al. (2000). In their studies mentions that Swiddening practiced by the Tayis as an integral component of the total agricultural system, not an adaptation of an earlier, more primitive, pure swiddening that is in the process of being replaced by more advanced irrigated farming. In such a way that neither swiddening a recent response to rapid population growth that has exceeded the carrying capacity of the wet rice fields and forced people to expand their farming onto the forested slopes. Instead, composite swiddeners such as the Tay have practiced both wet rice farming and swidden agriculture together as an integrated system of subsistence for

generations and probably centuries. Their findings have implications for understanding the role of shifting cultivation at more macro levels, including its contribution to global climate change

Pham (1999) studies focused on analysis of characteristics, causes and consequences of shifting cultivation among M'Nong ethnic group. The analysis is mainly qualitative with a supplementary quantitative analysis of the causes by logistic regression. The results of the study show that poverty associated with permanent food shortages is the main cause of shifting cultivation continuation. The population pressure, inadequate land for cultivation, limited access to credit and extension services, low education level, policy planning and implementation without people participation, in coordination in actions between government organizations and poor infrastructure are all influence farmers' decision to continue shifting cultivation. Agroforestry system is proved a potential alternative of shifting cultivation since it is more profitable and less risky.

Sodarak, H. (1999), studies shifting cultivation practices in the Nam Nane watershed area of Luang Prabaing Province, which is inhabited by Lao, Khamu, Hmong and ethnic groups. This study has shown that shifting cultivation systems provide subsistence and usually cash income. Agriculture yields are comparatively low but reliable, and farmers' adoption of new technologies is often hampered by the predominantly mountainous topography, the undeveloped infrastructure, the limited market demand, the relative poverty of the population, and other constraints. The practices of and dependence on shifting cultivation of Lao, Khamu and Hmong ethnic groups are different. As the major problems they face vary it was suggest that these must be taken into account while formulating development plans and policies for the people.

2.3 STUDIES IN INDIA AND NORTH-EAST INDIA

P.K Yadav (2013) in his journal states the importance of slash and burn agriculture, its characteristic and impact in North-east India. He also mention that the traditional farming system linked with ecological, socio-economic and cultural life of the indigenous people and closely concerned to their sacrament and festival that resolve their jhum fields and are organized to make place at various stage of the cultivation. He also recommends that there should be investment in research and extension to document and scientifically validate traditional shifting cultivation practices, increases their productivity, profitability, and enhance ecological and social benefits, providing formal recognition of the innovation practiced by farmers. Thus, a policy is needed to be acquired through the intervention of proper scientific approach to provide food and economic security to the Jhumias.

Biswal, D. K., & Kumar, S. (2013) in their studies attempt to get a picture of the meaning and applicability of the word 'Sustainable Development' for the shifting cultivator primitive tribal groups in Orissa. There are different projects developed to reduce shifting cultivation and to bring out sustainability. Because of the important impact of climate change on agricultural landscapes, and its recognized implications for food security, agricultural production and GDP, these projects are of great relevance to the first, second and third of these targets However, after seeing at this practice, they conclude that the philosophical and the practical view of life and livelihood hidden in the customs and traditions of the tribal groups practicing shifting cultivation have the strong justification over the modern laws of the so called civilized people. That, in its ideal nature shifting cultivation is a technique for the

utilisation and development available/reclaimable land for cultivation under unfavourable geographical conditions. That, it is the 'civilised people' of the plains that have deprived the tribal of their resources and have forced them to search for an alternative place of sustenance in the hill-forests, thus leading to shifting cultivation

Indrani Roy Chowdhury (2013) in her paper seeks to analyse the persistence of Jhum Cultivation of South Asia including North East India. The center is trying to build a formal game theoretic model which attempts to clarify how the existence of social capital can lead to persistence in Jhum. It is found that all equilibria involve too much labour being allocated to Jhum, compared to the case where there is no social capital. The perception relies on the fact that marginal social capital of the families is increasing in the labour being employed by the other families. This makes the amount of labour employed by the families as strategic complements and hence the result. , the release also said that turning to the relative statics they found that the results depend on whether the equilibrium is a corner one or not. Suppose that the population is not too large it is found that under the appropriate parameter restrictions there is a unique Nash equilibrium (corner equilibrium), where all of the labour is employed in Jhum cultivation. In this case they found that an increase in outside wages has no impact on labour allocated to Jhum, thus providing a theory of persistence of Jhum. Further it reveals that the amount of labour allocated to jhum is very large compared to the socially optimal level. She concluded that there is an inevitable threat of economic and social stagnation under the current demographic trends and severely constrained livelihood options in Mizoram.

Culas (2012) in his paper mentions that it is important to note that the majority of farmers are small-scale farmers in tropical developing countries.

Moreover, that those farmers live mostly in rural areas where their livelihoods depend mainly on the environment and natural resources. Thus, farmers' ability to derive sustenance and income from productively and sustainably managed natural resources is therefore part of a much larger question of alleviating rural poverty and food security, in particular, for the small holders and shifting cultivators (including landless farmers).He suggested that there is a need for smarter subsidies which target the smallholders and shifting cultivators as technological change for enhancing productivity growth and food security. He concludes that the future agricultural policies must also support rural income diversification because, given low yield and single season cropping under rainfed agriculture, smallholder crops can only be expected to make a minor contribution to the reduction in rural poverty despite contributing to food security.

The final report submitted by MART (April 2011) had investigated that Jhum cultivation has become unproductive owing to frequent exposure of soil as is evident from the reduction of jhum cycle from 20-25 years to 4-5 years. The report also highlights that agriculture occupies a very important place in the economy of Mizoram. It states that in the past in view of availability of vast Jhum land and Small population, the farming community could maintain, though low, a satisfying level of equilibrium. But increased population growth, changes in land use pattern resulting in loss of fertility and natural forest has profoundly impacted the economy rendering Jhum practices unsustainable. In the olden days with availability of vast area of land including forest land, smaller size of population and in view of self-sustaining families/ rural economy, the Jhum practices were a viable proposition. But the impact of increased pressure on land, particularly forest land led to shrinkage of 10 years Jhum cycle to 3-4 year cycle lowering productivity and production thus

rendering Jhum practice uneconomical. Therefore, for the study that looks at the overall livelihood ecosystem incorporating understanding of villagers, market players and enablers to analyze the livelihood scenario in the state, MART had used 3M (Micro Finance, Micro Market and Micro Planning) approach. This model primarily provides a tool to systematically map the local resources, skills, support services, markets and enabling environment for developing business plans.

Nang, G. K. (2011) studies examines social and cultural factors that shaped the life and culture of the Zomi through the known history as a result of contacts with other cultures, including western, Asian and related ethnic cultures. Encounter with the revival shaped the life of the Zomi in nationalism, theological concepts, worldview, church music, and worship. Through this encounter, some of the cultural practices that had been hidden by western Christian influence were rediscovered. It has been argued that opposition to the revival was due to western influence on Christianity and refusal of change in the church, overlooking the social and cultural background of the people concerned. It is mentioning that though poor and primitive they loved singing and dancing during festivals and feasts. Christianity is seen as economically viable for development that attracted the Zomis. Luxurious festivals and feasts were abandoned; they stopped drinking and killing animals on funerals. They develop better food when they become Christians. Economically Christians are better off that convinced the Zomis to become Christians.“Agriculture” popularly known as “Jhuming” is the chief occupation of the people. The staple crop is not rice but maize, millet, although a varying amount of rice is also grown. Other subsidiary field crops include bean, yam, peas, potatoes, gourds, cucumbers, sesame, onion,

garlic, brinjal, and chilies[14]. Not only these, hunting and feasting consumed a lot of time and production of agriculture suffered a great deal[15].

Suraj Bhan (2009) in his journal documents and analyses the shifting cultivation practices of the people of Konyak tribe through a case study of Ngangching village of Mon district of Nagaland with an objective of drawing lessons, and exploring possible use of this indigenous knowledge for development planning concerning natural resource management and land use in the region. He states that the practice of Konyaks is in many ways different from other tribes of Nagaland, he further briefly describe that the remarkable strategies employed by Konyak farmers during the two years cropping phase are the integration of trees in Jhum system, crop manipulation and crop mix and soil and water conservation measures. He concluded that the Terrace Rice Cultivation (TRC) experts who demonstrate the technique of developing terraces for rice cultivation had been a major factor in encouraging the people in the study area to have a settled cultivation.

Murtem, G., Sinha, G. N., & Dopum, J. (2008) made an attempt to highlight the views of the jhumias, policy and legal framework of shifting cultivation and solution to the shifting cultivation in Arunachal Pradesh, based on the deep research undertaken with practitioners of the Jhumias in the state. They mention that the rites performed before, during the process, sowing, harvesting and storage to appease the benevolent god depicts the association of jhuming with the culture. Moreover, the festivals of the tribes are all associated with the Jhum, such as Booriboot, Nyokum, Mopin, Solung, etc. The festival and relevant rituals are performed for the control of rodents and pests are associated with Jhum. They conclude that, shifting cultivation

[14] Lehman, F. K. (1963). *The structure of Chin society: A tribal people of Burma adapted to a non-western civilization*
[15] Laitanga, C.(1982). *Mizoram Paite Chanchin (History of Paite in Mizoram*).

is no way an evil for the Jhumias but a practice which have engraved deeply in socio - culture and to economy to sustain livelihood. Further indirect problem caused by it needs to be ascertained such as reduce in felling cycle, deforestation, encroachment (in name of Jhumming), soil erosion etc

Nirmal Chandra Sahu and Chandra Dhwaj Panda (2007) made an attempt to find out the determinants of the Podu practice, particularly the income from it, on a case study of a tribal village of the Lanjia Saura ethnic group. The results of their Cobb-Douglas production function analysis shows that the return to scale parameter is 0.97 and the output elasticity of land and labour are respectively 0.42 and 0.55. Thus, it confirms the hypothesis that the Podu production function exhibits almost constant returns to scale. They also conclude that it is necessary to approach the Podu practice with micro plans for ecological and economic promotion, rather than control it by law and regulation.

Surekha Sule (2006) in his article mentions that B K Tiwari, a professor at North-Eastern Hill University, Shillong, classifies shifting agriculture into four types: traditional, distorted, innovated and modified. This classification aids in understanding how jhum has changed over the years and what is going wrong with newer practices of jhum. In land scarce villages, for reasons such as population increase, fallow periods are reduced and shifting agriculture has got distorted. Elsewhere the jhum has spread to lands with steep slopes due to non-availability of lands with lesser degrees of slopes. In Mizoram at places less than 1000m altitude, the distorted shifting agriculture has converted much of the subtropical evergreen and semi evergreen forests into scrub and bamboo brakes. His articles explain shifting agriculture and why it has earned a bad reputation. He further states that the community cultivates land for its livelihood while practising conservation and taking

care of the ecological balance. He pointed out Jhum cultivation under sharper scrutiny, that over the years, many of these forest dwellers got pushed into employing distorted versions of shifting agriculture. Vested interests are using these distortions to press for outlawing the traditional shifting cultivation.

Shah (2005) studied detailed geographical account of Manipur and nature of agriculture of Manipur. He selected Ukhrul District for indepth study to assess the past and present position of jhum, socio-economic conditions of Jhumias and impact of jhum on forest, soil, flora, fauna and hydrological cycle etc. He concluded that Jhuming is a way of life for the tribals as their needs, food habits, folklores, festivals and the overall cultural ethos has a say in jhum. He also suggested that any transformation in jhum area should be socially acceptable, economically profitable and ecologically sustainable. He also further state that any delay in implementation of better techniques will lead to converting the whole area under jhum into an ecologically slum.

Gupta (2005) paper attempts at understanding the complex relation of the socio-cultural life of Bangni jhumias of East Kameng. He found out that the practise of jhum is thus not merely another exercise method of earning a livelihood, a traditional farming system that 'uses local products and techniques', has roots in the past', has evolved to their present stage as a result of the interaction of the cultural and environmental condition of the region and is deeply embedded in the tribal psyche. He described the socio-cultural beliefs, magico-religious practices, festivals and rituals associated with Jhum to give view of their traditional system of agriculture and land management. He concludes that different Government schemes as an alternatives or rehabilitating were not continued for sufficient long period of

time to make Jhumias self-reliant. In such a way to provide an assured livelihood, moreover he mentions that the schemes lacked an adequate extension backup.

Amalendu Jyotish (2004) carried out studies on ecological, economical and institutional aspects of shifting agriculture in Orissa. His findings include that "Terrace Cultivation as an alternative to Shifting Cultivation is not viable because it's low and erratic level technical efficiency". He demonstrate that family labour, reciprocated labour, size of operation and size of fallow holding are major determinants of output in shifting cultivation. He reveals that the overall efficiency in Shifting Cultivation is very high and it is even higher in terms of energy output. Therefore, his study shows that the efficiency energy outcome implies that shifting cultivation can be upheld as a sustainable agriculture practice.

Girindra Nath Das (2001) in his book *Swidden Cultivation and Development Programmes in North-East India* deals with the various aspects of swidden cultivation with reference to North-east in general and Assam in particular. He thoroughly analysed the infrastructure facilities and demographic structure of the selected IJDP centres while occupational structure, land-holding pattern and extent of income and expenditure among the people under investigation have been furnished in detail. His work brings into focus a jhum control programme in Assam in its proper perspective.

Lalrinthanga (2001) in his study focuses the agrarian structure, employment, output and marketed surplus of foodgrains under shifting and settled cultivation. He reveals that jhum cultivation is operating under diminishing returns to scale whereas settle cultivation is operating under increasing return to scale.

2.4 CONCLUSION

This comprehensive review of the literature has outlined the effects of shifting cultivation, and has discussed motivating factors like its alternatives, profiles, predictors, negative impacts, rehabilitation, and economics concern on Shifting Cultivation.

The review of literature let us evident that quite a number of studies have already been undertaken on shifting cultivation and its related issues. This shows that in spite of different views on the way towards the sustainable development in shifting cultivation, it is commonly agreed that pursuing the aim of sustainable, economical, and ecological sound development is necessary. However, poverty and population are two main constraints to reach these objectives.

Therefore, it can be generalised that in the past in view of availability of vast Jhum land and Small population, the farming community could maintain, though low, a satisfying level of equilibrium. However increased population growth, changes in land use pattern resulting in loss of fertility and natural forest has profoundly impacted the economy rendering Jhum practices unsustainable.

References

Amalendu Jyotish. (2004). *Ecological, Economic and Institutional Aspects of Shifting Agriculture: A study in Orissa,* PhD Thesis, Institute for Social and Economic Change, Bangalore University, Bangalore

Aryal, K. P., Kerkhoff, E. E., Maskey, N., & Sherchan, R. (2010). Shifting Cultivation in the Sacred Himalayan Landscape: A Case Study in the Kanchenjunga Conservation Area.©. *WWF Nepal, Kathmandu*.

Biswal, D. K., & Kumar, S. (2013). Shifting Cultivation and Policies of Sustainable Development: A meaningless Obsession. *Journal of Economic & Social Development*, *9*(1).

Bhan,S.(2009). A case study on shifting cultivation practices in Mon District of Nagaland. *Journal of Soil and Water Conservation,* Vol.8, No.2, pp 8-13.

Culas, R. J (2012): *Technological Change and Productivity Growth for Food Security: The Case of Shifting Cultivation and the REDD Policy*- Chapter 8, In: Jones, M. A and Hernandez, F. E (edited) Food Security: Quality Management, Issues and Economic Implications, Nova Science Publishers, Inc. Hauppauge, NY,USA.

Das, Girindra Nath.(2001). *Swidden Cultivation and the Development programmes in North-East India.* New Delhi: Akansha Publishing House. pp.*4-5*

Ellen Louise McCallie (2008*). An indigenous strategy for intensifying Shifting Cultivation in Southeast Asia: A shrub-based (Tecoma Stans) managed fallow in West Timor, Indonesia.* Master of science, Thesis Cornell University, Ithaca.

Fox, J., Truong, D. M., Rambo, A. T., Tuyen, N. P., & Leisz, S. (2000). *Shifting cultivation: a new old paradigm for managing tropical forests. BioScience*, *50*(6), 521-528.

Gupta, V. (2005). Jhum cultivation practices of the Bangnis (Nishis) of Arunachal Pradesh. *Indian J. Traditional Knowledge*, *4*(1), 47-56.

Laitanga, C. (1982). *Mizoram Paite Chanchin (History of Paite in Mizoram*). Aizawl, Mizoram: Tribal Research Institute.

Lalrinthanga (2001). *Comparative Economics of jhum and settled cultivation in Mizoram: with special reference to agrarian structure, employment, output and marketed surplus of foodgrains*, Ph.D., Thesis NEHU., Shillong.(Un-published).

Lehman, F. K. (1963). *The structure of Chin society: A tribal people of Burma adapted to a non-western civilization* (No. 3). University of Illinois Press.

Mai, P. T. (1999). Socio-economic analysis of shifting cultivation versus agroforestry system in the upper stream of lower mekong watershed in Dak Lak province. *National University of Viet Nam*.

MART (April 2011). Livelihood Based Agri Business and Market Studies for North East Rural Livelihood Project. Final Report.

Miah, M. M., & Islam, S. F. (2007). *Shifting cultivation and its alternatives in Bangladesh: productivity, risk and discount rates* (No. 57).

Murtem, G., Sinha, G. N., & Dopum, J. (2008). Jhumias view on shifting cultivation in Arunachal Pradesh. *Bull Arunachal Forest Res*, *24*(1&2), 35-40.

Nang, G. K. (2011). *Zomi Christianity and cultural transformation*. Fuller Theological Seminary, School of Intercultural Studies.

Nath, T. K., Inoue, M., & Chakma, S. (2005). Shifting cultivation (jhum) in the Chittagong Hill Tracts, Bangladesh: Examining its sustainability, rural livelihood and policy implications. *International Journal of Agricultural Sustainability*, *3*(2), 130-142.

Roy Chowdhury, Indrani. (2013, 30th April). Economic Analysis of Jhum: Collective Action, Social Capital and Labour Market. *Seminar.* Lecture conducted from the Centre for International Trade & Development School of International Studies of Jawaharlal Nehru University. New Delhi, Delhi.

Sahu, N C & Panda, C D, (2007, 5th January). An econometric analysis of shifting cultivation in an Indian tribal village. The 43rd Annual Conference of the Indian econometric society. IIT Bombay, Mumbai.

Shah, Md.Bahar-Ud-Din (2005). *Manipur Jhum and eco-Degradation.* Delhi B.R Publishing Corporation.

Sharma, D. P. (2011). Understanding the Chepangs and Shifting Cultivation: A Case Study from Rural Village of Central Nepal. *Dhaulagiri: Journal of Sociology & Anthropology*, *5*.

Sodarak, H. (1999). *Shifting cultivation practices by Hmong, Khamu and Lao ethnic categories in the nam Nane watershed, Nane district, Luang Prabang province, Lao PDR* (Doctoral dissertation, MS thesis, Swedish University of Agricultural Sciences, Department of Rural Development Studies, Uppsala)

Takasaki, Yoshito, (2011).*Economic models of shifting cultivation: a review.* Tsukuba Economics Working Papers 2011-006, Economics, Graduate School of Humanities and Social Sciences, University of Tsukuba.

Yadav PK (2013). Slash-and-Burn Agriculture in North-East India. Expert Opin Environ Biol 2:1

Web Reference

.

Sule.S. (December 2006). The News in Proportion, http://www .indiatogether.org /2006/dec/agr-jhum.htm (Retrieved April 5th, 2013)

CHAPTER 3

OVERVIEW OF SHIFTING CULTIVATION IN MIZORAM

CHAPTER 3: OVERVIEW OF SHIFTING CULTIVATION IN MIZORAM

3.1 INTRODUCTION

Mizoram is one of the Seven Sister States of the North Eastern India, bordered by Myanmar (formerly known as Burma) to the east and south, Bangladesh to the west, and by the states of Manipur, Assam, and Tripura to the north. Mizoram in the local language means, Land of the Highlanders, (from *mi* 'people', *zo* 'hill', *ram* 'country', literally "land of the hill people" / Mizo people)[16]. The Mizo Hills, which dominate the state's topography, rise to more than 2000 m (6560 ft) near the Myanmar border. Aizawl, the state capital, is 1220 m (4000 ft) above sea level.

Mizoram became the 23rd state of India on 20 February 1987. It is divided into 8(eight) districts namely, Aizawl District, Lunglei District, Kolasib District, Mamit District, Champhai District, Serchhip District, Saiha District and Lawngtlai District . There fifteen (15) number of administrative Sub-Divisions with twenty (22) number of Rural Development Blocks. Each District is headed by a Deputy Commissioner while each Sub-Division is under the administrative control of Sub-Divisional Officer. Since Chhimtuipui area (comprising Saiha and Lawngtlai District) is the most backward of all the districts, special attention has been given to it, and some important subjects have been transferred to the three District Councils within Chhimtuipui area since 1982-1983, namely Chakma Autonomous District Council Lai Autonomous District Council (LADC) for Lai people in Southern part of

[16] Mizoram from Wikipedia, the free encyclopaedia (http://en.wikipedia.org)

the state, and Mara Autonomous District Council (MADC) for Mara people in the southern-eastern corner.

Table 3.1: MIZORAM AT A GLANCE (a)

Sl no.	Particulars	Unit	
1	**Geographical Area**	Sq. Km	21,087
2	**Geographical Location**		
	Longitude	Degree	$92^0.15'$ E to $93^0 29'$ E
	Latitude	Degree	$21^0.58'$ N to $24^0.35'$ N
3	Length		
	North to South	Kms	277
	East to West	Kms	121
4	**International Borders**		
	With Myanmar	Kms	404
	With Bangladesh	Kms	318
5	**Inter State Borders**		
	With Assam	Kms	123
	With Tripura	Kms	66
	With Manipur	Kms	95
6	**Administrative Set Up**		
	1. No. of District	No.	8
	2. No. of Autonomous District Council	No.	3
	3. No. of sub-Division	No.	23
	4. No. of RD Block	No.	26
	5. No. of villages (2011 census)	No.	719

Source: Economic Survey Mizoram 2012-2013

Table 3.2: MIZORAM AT A GLANCE (b)

Sl.no	Particulars	Unit	
1	**Total Population**	**(2011 Provisional)**	
	Persons	Nos.	10,91,014
	Male	Nos.	5,52,339
	Female	Nos.	5,38,675
2	**Decadal Population Growth**	**(2001-2011)**	**(Provisional)**
	Absolute	Nos.	2,02,441
	Per centage	%	22.78
3	**Population Density**	Per Sq. Km	52
4	**No. of females per 1000 males**	Nos.	975
5	**0-6 Population (2011 Provisional)**		
	Persons	Nos.	1,65,536
	Males	Nos.	83,965
	Females	Nos.	81,571
6	**Literacy (2011 Provisional)**		
	Persons	Nos.	8,47,592
	Males	Nos.	4,38,949
	Females	Nos.	4,08,643
	Rate	%	91.58
7	**Population (2001)**		
	Rural	Nos.	4,47,567
	Urban	Nos.	4,41,006
8	**Total Workers (2001)**		
	Main Workers	Nos.	3,62,450
	Marginal Workers	Nos.	1,04,709

Source: Economic Survey Mizoram 2012-2013

The length of Mizoram is 320 km and the breath is 160 km. The surface is undulating and a broken hill mainly runs from North to South. Similarly, the major rivers also run from North to South. The altitude ranges from 21 metre at Tlabung to 2,175 m at Phawngpui (Blue Mountain). Temperature ranges from 10^{o}C to 36^{o}C and

the annual rainfall ranges from 2,000 mm to 2,500 mm. The climate is characterised by monsoon rains from May to October, winter from first part of December to the end of February and summer without rainfall except few shower from first part of March to the end of April. As a whole, Mizoram climate is pleasant during winter and moderately warm during summer. Soils of Mizoram are mostly acidic, low in organic carbon, low in phosphate and medium in potash content. The soil is young without very hard rocks and no lime stone deposited. Quality of sand is also poor while almost all the crops thrive well in Mizoram condition.

This chapter contain a brief description of the status of shifting cultivation in Mizoram which will describe shifting cultivation as a primitive mode of agriculture practice till today. The status of shifting cultivation in Lawngtlai District is also discussed. The policies and programme related to shifting cultivation implemented by the state government will be discuss and ended with a conclusion of this chapter.

3.2 STATUS OF SHIFTING CULTIVATION IN MIZORAM

Agriculture is the mainstay of the people of Mizoram. About 60% of the population depends upon agriculture and allied sector. About 32% of the cultivated area is under Jhum cultivation. The age old practice of Jhum cultivation is carried out annually by a large number of people living in rural areas. Shifting Cultivation is known as 'Lo' in Mizoram. The cropping pattern generally followed for 'Lo' in Mizoram is a mixed type. Rice is the main crop grown in the state .Mizoram has the highest proportion of land under shifting cultivation. This is for the basic reason that compared to all other states Mizoram has been blessed with the least flat land. In other word, the whole topography of the states is either clad in thick forest rising slowly or there are steep hills, where cultivation is extremely difficult[17]. Shifting cultivation involves only human power. All the agricultural operations are performed manually with a few traditional and primitive tools. The method of cultivation is marked by the following agricultural operations:

1) Selection of forest land.
2) Slashing or clearing the forest vegetation.
3) Drying of slashed vegetation.
4) Burning of dried vegetation.
5) Sowing of seeds.
6) Weeding for two or four times.
7) Watching and protection.
8) Harvesting.
9) Threshing and storing.

[17] Mahajan.V.S. (1990): *Mizoram's jhum revisited, in: Shifting Cultivation in North-East India.* pp.229-236

10) Fallowing [18]

All their other activities revolve around the Jhum operation and their festivals are all connected with such agricultural operation. The Mizo's have three main festivals- Mim Kut, Chapchar Kut and Pawl. These festivals or Kuts as they call them are in one way or another associated with their agricultural activities

Chaphar Kut or Spring Festival is the most popular festival, celebrated after completion of their most arduous task of jungle clearing for "jhum" operations. At the end of February, when winter starts receding, the Mizo's prepare the land for fresh planting. There are few days of relaxation before the serious business of sowing starts and that is when the Chapchar Kut festival is celebrated with gaiety and fervour.

It is the only one regularly observed during the first week of March in Mizoram. On this day people of all ages, young and old, men and women dressed in their colourful costumes and distinctive head gears and jewelleries, assemble and perform various folk dances, singing traditional songs accompanied by beating of drums, gongs and cymbals. They dance in joyous celebration of life, each team displaying the best of its region. These are generally group dances with a lot of bonhomie and courting woven into them. Some dances are strictly martial danced by strong virile warriors with their weapons and trophies. One dance perennially popular is the Cheraw or the "bamboo dance" so called as long bamboo staves are used for this dance. This is the most colourful and distinctive dance of the Mizo's requiring skill and an alert mind to perform. The other main dances performed during

[18] Tawnenga. (1990): *Studies on Ecological Implication of Traditional and Innovative approaches to Shifting Cultivation in Mizoram*.

Chapchar Kut are Khuallam, Chheihlam, Chai and Sarlamkai. "Khual lam" is an auspicious dance performed by a group of dancers celebrating new beginnings. It is also a welcome dance for guests during community festivities.

To attain a position of distinction, a Mizo had to go through a series of ceremonies and perform many feats of heroic deeds. These ceremonies are always accompanied by a feast and to this feast, friends from nearby villages are invited - hence, Khuallam is the dance for the visitors or guests. The "Chheih lam" is another community dance performed by both men and women. The war dance "Solakia", a prerogative of the male population of the community, is accompanied by rhythmic beating of the drums Exhibition and sale of indigenous Handloom and Handicraft products and other tourist attractions like flower show, food festival, musical competition and different traditional games are also organized during the Chapchar Kut festival[19].

Mim Kut or Maize Festivals: Since cultivation is the prime source of socio-economic survival of the people of Mizoram hence most of the festivals are associated with some or other harvesting processes of August and September, after the harvest of Maize. It is celebrated after harvesting Maize, in the month of August and September. This festival is dedicated to the memory of dead relatives and the first harvest is generally offered to the memory of the dead by placing it on a raised platform. Mim Kut is celebrated with great fanfare by drinking rice- beer, singing, dancing and feasting. Sample of the year's harvests are consecrated to the departed souls of the community.

[19] Chapchar kut from Department of Tourism, Govt. of Mizoram. (http://tourism.mizoram .gov.in)

Pawl Kut is harvest Festival-celebrated during December the harvests are over. Community feasts and dances are part of this festival. A custom called Chhawnghnawt is performed during this festival where mothers and their children sit on a memorial platform and feed one another.

Thalfavang Kut: This festival is celebrated every November after the weeding of the land is completed before the forthcoming harvest season. This festival is considered as one of the most significant festivals in Mizoram. Completion of weeding of the crop fields to make them suitable for harvesting activities is a primary farming operation of the cultivators of Mizoram. It is celebrated at a time when this weeding of the farm lands in Mizoram is completed by the cultivators. It is one such occasion when the local inhabitants of Mizoram are involved in a wide array of festive activities.

The tribal groups living in all corners of Mizoram participate in various cultural events that are organized during the Thalfavang Kut festival. With vibrant shades of dance costumes the local people of Mizoram present an awe-inspiring range of performances to celebrate Thalfavang Kut. The entire region of Mizoram becomes a vibrant platform of enjoyment and enthusiasm when Thalfavang Kut is celebrated in the place.

Another interesting trait of the festival of Thalfavang Kut is that it provides a scope to the tribal communities living in the far flung corners of Mizoram to represent their inherent cultural characteristics. Otherwise inhabiting remotely approachable places, the different tribes and sub-tribes of Mizoram get a pulsating base during the Thalfavang Kut festival where their talents are viewed by other

people. In a way; Thalfavang Kut is not only a festival but also an opportunity to showcase the hidden cultural traits of the tribes of Mizoram[20].

Thlai thar kut: Mim kut is replaced by Thlai thar Kut since Christianity is followed by the Mizo's. It is mostly celebrate in the month of September. The name 'thlai' means vegetables and 'thar' means new or fresh, it means to state the new fresh agriculture products etc. It is a festival in which farmers bring their new harvested products to the church, and after devotion those 'thlai thar' were place for auction and the all goes to the church foundation, It took place on Sunday, but in some place it is celebrate on Saturday followed by feast and singing the gospel hymn etc. It is more like an offering to God for his blessing and guidance the whole year in the process of sowing to harvesting crops. In other words 'Thlai thar kut' is more like tithes.

Bizu: It is the most important socio-religious festival of the Chakma and lasted for three days and begins on the last day of the month of Chaitra. The first day is known as *Phool Bizu*. On this day, household items, clothes are cleaned and washed, food items are collected to give the house a new look with the veil of different flowers. The second day known as *Mul Bizu* day starts with the bath in the river. People wear new clothes and make rounds of the village. They also enjoy specially made vegetable curry known as "Pazon ton", different homemade sweets and take part in different traditional sports. The day ends with the Bizu dance. The last day, this is known as Gojjepojje din involves the performances of different socio-religious activities. In the context of its nature some say that Bizu is a festival, which revolves around agricultural activities because it is celebrated in mid-April

[20] Department of Tourism, Govt. of Mizoram. (http://tourism.mizoram.gov.in/page/thalfavang-kut.html)

when the earth is just drenched with the first rain and the jhum sowing is taken up. And it is believed that with the objective of getting rich harvest worship of the earth was arranged which later on took the form of a festival. However of late it has lost its agricultural character.

*Khuado Kut**:*** One of the major festivals of the Paite community, Khuado Kut is celebrated as a thanksgiving festival when all the harvesting work is done. This festival is held during full moon nights which are regarded auspicious for this event. The term Khuado is a combination of two terms - khua and do. Khua means a village or town. Khua indicates night time or darkness. Khua also refers to the deity Khuanu/Khuazing of the past animistic Paite Zomis. Do on the other hand means to defend oneself. Khuado can be summed up as an event or an occasion in which the villagers fight back the evil spirit and engage themselves in a sort of spirituality. This was done to predict the well being of the village and also wish to have a good harvest for the next season. The festival marks organizing of a mega feast where the whole village, young and old alike share an extravagant meal till the last day of the festival.

The steps involved in shifting cultivation in Mizoram[21].

Step 1*: Selection of site of forested land (December)*

The selection of site is done by plot selection through the Village council of each village or locality. The Village Council is the authorized body to allot sites to the villager.

Step 2: *Site Preparation; clearing and burning (December-March).*

[21] Jha, L. K (1997). *Shifting Cultivation.* New Delhi: APH Publishing.pp 8-10.

This step is mainly performed in December, January or February .The trees in the area are felled and the undergrowth is cleared. The trees are left to dry before they are burnt. The ashes of the burnt trees act as fertilisers for the soil.

'Thlam' or a hut is built in the jhum land for shelter from heavy rain or strong sun, preparing meals, overnight shelter in guarding fields just before and during harvesting and temporary storage of rice during harvest time.

Step 3: *Sowing of seeds and transplanting (April-May).*

This step is mostly performed in April or May. This involved sowing and transplanting of seeds just before spring rain. Planting is carried out after the ground has cooled. Holes are made with a dibble stick, into which seeds could be dropped.

Step 4: *Weeding*

Weeding is done several times i.e atlest 3-4 times on different month's interval.

- *Hnuhpui:* It is the first weeding; it is carried out during the month of May to June. It is carried out when the crops i.e. rice and maize are few inches in height and suppressed by the luxuriant growth of weeds.
- *Hnuhhram;* It is the second weeding. It is normally carried out in early July which is also the flowering time for rice plants. This is more difficult than the first weeding due to the high density of rice plants. Labour is also hired to do the bristly weed.
- *Thual:* It is the third weeding or the residual weed. It is normally starts in August.

- Sometimes it is weeded four times doing extra weeding before harvesting and are also called ‘Pawhchhiat’.

Step 5: *Harvesting*

Before the rice is harvested the crops are watch and guard for protection from birds, rats and wild animals like wild boar, fox etc. The short-term rice variety is harvested in early September. Rice is dried in the sun for days then piled and kept in the house. The medium-term harvesting normally starts in October. The harvest of long-term rice varieties starts between November and early December.

Step 6: *Threshing, transport and storage*

Threshing begins in early December. In general all three group use labour exchange, which means that each family has their harvest threshed in turn. Transporting the harvest to the village is a tedious job. Materials used for carrying upland rice are various kinds of bamboo baskets carried on their backs called ‘Emping’, women carried 2 Tin to 2.5 Tin of rice, while man carried 3 Tin to 3.5 Tin of rice. As,1 Tin= 7 kg of rice, which shows woman carried 14kg to 17.5kg of rice, while man carried 21kg to 24.5 Kg of rice. After threshing is finished the main grain is stored in a storehouse or in the house in a material called ‘Dawrawn’ or ‘Zem’ which is shown with picture at the appendix taken from the study area. Some common craft used are empai, tlamem, paikawng, thlangra, hnam, paikawng etc

Table- 3.3 AREAS, PRODUCTION AND YIELD OF PRINCIPAL AGRICULTURAL CROPS IN MIZORAM (A)

Sl. No.	Name of crop	2008-2009			2009-2010		
		Area (Ha.)	Production (MT/Ha.)	Yield (MT/Ha.)	Area (Ha.)	Production (MT/Ha.)	Yield (MT/Ha.)
1	2	3	4	5	6	7	8
1	Paddy (a) WRC-Kharif	51,859	68,637	1.32	47,085	65,894	1.40
	(b) WRC-Rabi	131	280	2.13	119	238	2.00
	TOTAL	**51,990**	**68,917**	**1.32**	**47,204**	**66,132**	**1.40**
2	Maize	9,558	9,318	0.97	8,551	11,510	1.35
3	Pulses	3,931	3,646	0.93	3,920	6,479	1.65
4	Oilseeds	3,275	2,514	0.76	2,741	2,988	1.09
5	Sugarcane	1,342	13,696	10.20	1,434	12,368	6.82
6	Potato	269	1,569	5.83	285	2,235	7.80

Source: Statistical Handbook of Mizoram 2010

Table- 3.4 AREAS, PRODUCTION AND YIELD OF PRINCIPAL AGRICULTURAL CROPS IN MIZORAM (B)

Sl. No.	Name of crop	2010-2011			2011-2012		
		Area (Ha.)	Production (MT/Ha.)	Yield (MT/Ha.)	Area (Ha.)	Production (MT/Ha.)	Yield (MT/Ha.)
1	2	3	4	5	6	7	8
1	**Paddy**	28,562	37,854	1.325	25,826	38,064	1.474
	(1) Jhum	12,123	29,567	2.439	12,700	36,149	2.846
	(2) WRC-Kharif	7	8	1.143	450	1,353	3.007
	(3)WRC-Rabi	7	8	1.143	450	1,353	3.007
	TOTAL	**40,692**	**67,429**	**1.657**	**38,976**	**75,566**	**1.939**
2	Maize	9,005	13,499	1.499	6,905	8,397	1.216
3	Pulses	3,957	6,065	1.533	3,836	5,331	1.389
4	Oilseeds	3,140	3,727	1.187	2,474	2,382	0.963
5	Sugarcane	1,418	7,900	5.571	1,463	7,456	5.096
6	Potato	431	3,699	8.582	409	2,868	7.012

Source: Statistical Handbook of Mizoram 2012

Out of the total geographical area of 21, 08,700 ha, the gross cropped area of the state at present is 1, 38,556 ha account for 6.57 per cent of the total area. Due to hilly terrain potential area for Wet Rice Cultivation (WRC) is very limited. It is

estimated that there are 74,644 ha of area having a slope of 0-25 per cent which can be developed for WRC areas. Although marginal increased in WRC areas from 12,700 Ha to 14,940 Ha, which account for 17.64 per cent increase over 2011-12 is recorded, 79.98 per cent of the remaining potential areas still needs to be developed. Out of the gross cropped area during 2012-13, 55 per cent the total area is under Rice cultivation, 19 per cent under Oil Palm, 2 per cent under sugarcane, 6 per cent under Oilseeds and 7 per cent under pulses respectively. Studies conducted through Remote sensing technology confirmed that there are altogether 2, 98,786 Ha of land under the category of 26-33 per cent slope in Mizoram which can be developed for hill slope terrace cultivation. Therefore, a challenge remains for developing those potential areas and during 12th 5 year plan, it is targeted to bring more potential areas under Rice cultivation particularly WRC-I & II (potential plain areas) with assured irrigation to boost Rice production for the coming years. Therefore oil Palm cultivation, crop diversification programme has also largely focused on promoting the cultivation of cash crops like, sugarcane, pulses and Oil seeds that has seasonal advantage over other crops

T. R. Shankar Raman has stated that in Mizoram, we only see jhum fires burning forests; we fail to see forests and bamboo regenerating rapidly after a season of cultivation. ISFR estimated that bamboo bearing areas occupy 9,245 square kilometres or 44 per cent of Mizoram. For every hectare of forest cleared for jhum, farmers retain 5 to ten hectares as regenerating fallow and forest in the landscape. Also, forests left uncut by jhum farmers contain bamboo species.

In Mizoram, more than 60 % of the total work force of the state inhabits over 782 villages spread over the mountain landscape from low hills to high mountain areas. The dominant features of hill and mountain farming in Mizoram are small land

holdings, sloping marginal farmlands and cultivation under rain fed farming. Subsistent farming on these farmlands is still dominating feature.

The principal crop is paddy, maize, cucumber, beans, arum, ginger, mustard, sesame, cotton etc. After clearing the burnt jhum, seeds for paddy are sown. Two types of paddy seeds are sown in the same field as early paddy and principal paddy. Tapioca, sugarcane, cotton, pulses and oilseeds are also cultivated. Pulses like cowpea, rice beans and oilseeds crops like sesame, mustard and soybean too are cultivated etc. The mainstay of economy of Mizoram is agriculture, which is currently exhibiting trends of increasing unsustainability. Crop production in the region is characterised by low input – low yield concept. Slash and burn agriculture is still predominantly practiced in almost all the district of Mizoram on steep slopes with reduced fallow cycle of 2-3 years against 10-15 years in the past. The basic issues facing agriculture in the region are low productivity, inadequate access to appropriate technologies and other external inputs, increased natural calamities etc. In the absence of major industries, the society is agrarian and depends on agriculture, forest and allied sectors for livelihood and other support.

A report[22] estimates the proportion of shifting cultivation area in Mizoram to be about 30% - predominant part of which was for rice production (56% to 63% depending on the year). Despite dedicating largest amount of labor, jhum cultivated and non-jhum crop area to rice, the yields are low; Mizoram average rice yields per acre is about 70% of India's average rice yield per acre and 32% of India's best yield. Mizoram produces about 26% of rice it consumes every year, and it buys the deficit from other states of India

[22] Goswami, K., Choudhury, H. K., & Saikia, J. (2012). Factors influencing farmers' adoption of slash and burn agriculture in North East India. *Forest Policy and Economics*, *15*, 146-151.

3.3 Status of Shifting Cultivation in Lawngtlai District

Lawngtlai District constitutes 12.32 per cent of forest of the total geographical area of Mizoram. The villages under the selected circle are highlighted as follows:

Sangau Circle: The villages under this circle are Lungpher 'S', Sentetfiang, Sangau I, Sangau II, Thaltlang, Pangkhua, Cheural, Bualpui 'NG' I, Bualpui 'Ng' II, Archhuang, Rawlbuk, Vartek, Lungtian. Sangau is a town in Lawngtlai district in Mizoram. Although The Official language in Mizoram is Mizo Ṭawng, the native people of Sangau mainly used Lai Hawlh. It is the second most populous town within Lawngtlai district According to the latest Census 2011 conducted by Government of Mizoram.

Diltlang Circle: The village under Diltlang Circle are Bungtlang 'S', M.Kawnpui and Saizawh East.

Lawngtlai Circle **:** It consist of town area of Rulkual, Saikah 'L', R.Vanhne, Paithar, College Veng, Council Veng, Thingkah, Ngenpuikai, Tialdawngilung, Lawngtlai IV, Lawngtlai Vengpui, Hmunlai, Mampui.

A3.1 Map of Lawngtlai District indicating Rural Development Blocks and the Survey Areas

Table- 3.5 NUMBERS OF VILLAGES WITH HOUSEHOLD & CULTIVATORS FAMILIES DURING 2009-2010 IN LAWNGTLAI DISTRICT

Sl.no	Name of Circle	No. of village	Total No. of Household	Total No. of Jhum Cultivator family	No. of WRC cultivators families	Total No. of cultivators families	Out of column 7 No. of families operating both Jhum & WRC
1	2	3	4	5	6	7	8
1	Lawngtlai	20	4807	2971	102	3073	15
2	Sangau	17	3982	3207	484	3691	72
3	Diltlang	48	6198	5568	234	5802	68
4	Chawngte	20	3739	1405	277	1682	96
5	Borapansuri	15	1747	1184	339	1523	28
6	Damdep	43	3067	2107	760	2867	58
		163	23540	16442	2196	18638	337

Source: Agriculture Statistical Abstract 2010-2011

Table- 3.6 NUMBERS OF VILLAGES WITH HOUSEHOLD & CULTIVATORS FAMILIES DURING 2010-2011 IN LAWNGTLAI DISTRICT

Sl.no	Name of Circle	No. of village	Total No. of Household	Total No. of Jhum Cultivator family	No. of WRC cultivators families	Total No. of cultivators families	Out of column 7 No. of families operating both Jhum & WRC
1	2	3	4	5	6	7	8
1	Lawngtlai	20	4821	2982	121	3103	17
2	Sangau	18	2510	2393	65	2458	17
3	Diltlang	48	6248	4002	307	4309	21
4	Chawngte	21	3776	1367	265	1662	112
5	Borapansuri	15	1780	1140	417	1557	56
6	Damdep	43	3260	2004	775	2779	67
	TOTAL	165	22395	13888	1980	15868	290

Source: Agriculture Statistical Abstract 2010-2011

Table-3.7 NUMBERS OF VILLAGES WITH HOUSEHOLD & CULTIVATORS FAMILIES DURING 2011- 2012 IN LAWNGTLAI DISTRICT

Sl.no	Name of Circle	No. of village	Total No. of Household	Total No. of Jhum Cultivator family	No. of WRC cultivators families	Total No. of cultivators families	Out of column 7 No. of families operating both Jhum & WRC
1	2	3	4	5	6	7	8
1	Lawngtlai	21	8722	2985	125	3110	18
2	Sangau	21	3596	2452	73	2525	23
3	Diltlang	48	5897	4022	315	4337	26
4	Chawngte	18	3805	1379	303	1682	114
5	Borapansuri	19	2777	1732	445	2177	62
6	Damdep	43	3422	2044	758	2802	72
	TOTAL	170	28216	14614	2019	16633	315

Source: Agriculture Statistical Abstract 2011-2012

The above tables have shown the numbers of villages with household and cultivators families during 2009-2012 in Lawngtlai District. According to a report[23], in 2009-2010, 69.8 per cent of the total number of household belongs to the total no. of jhum cultivator family. In 2010-2011 the total no. of jhum cultivator family falls to 62 per cent of the total number of household.

In 2009-2010, 9.32 per cent of the total number of household belongs to the total no. of WRC cultivator family. In 2010-2011, 8.84 per cent of the total number of household belongs to the total no. of WRC cultivator family falls.

In 2009-2010, 0.14 per cent of the total number of household belongs to the total no. of both WRC and Jhum cultivator family. In 2010-2011, 1.29 per cent of the total number of household belongs to the total no. of both WRC and Jhum cultivator.

In 2009-2010, 21.54 per cent of the total number of household does not engage to jhum or WRC. In 2010-2011 In 2010-2011, 28.17 per cent of the total number of household does not engage to jhum nor WRC.

In 2009-2010, Lawngtlai constitute 22.7 per cent of the total no. of jhum cultivators and 20.42 per cent of the total no. of WRC cultivators in Mizoram. In 2010-2011, it constitutes 20.29 per cent of the total no. of jhum cultivators and 16.85 per cent of the total no. of WRC cultivators in Mizoram

The numbers of villages with household and cultivators families during 2011-2012 in Lawngtlai District is not taken into account because the total number of household from Lawngtlai circle increased double i.e. to 8722 number of household from 4821 and 4807 number of household in 2010-2011 and 2009-2010 respectively.

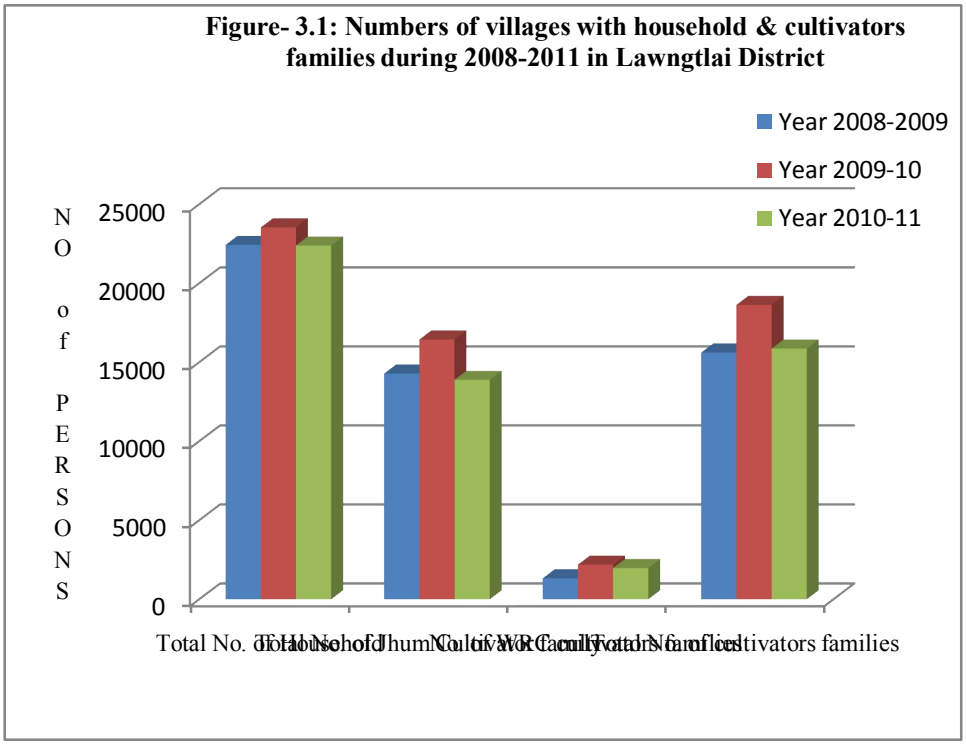
[4] Statistical Abstract 2010-2011. pp. 81-83.

This shows that the 2011-2012 data is not valid and is not taken into consideration. So instead like us account the no. of villages with household & cultivators families during 2008-2009.

Table- 3.8 NUMBERS OF VILLAGES WITH HOUSEHOLD & CULTIVATORS FAMILIES DURING 2008-2009 IN LAWNGTLAI DISTRICT

Sl.no	Name of Circle	No. of village	Total No. of Household	Total No. of Jhum Cultivator family	No. of WRC cultivators families	Total No. of cultivators families	Out of column 7 No. of families operating both Jhum & WRC
1	2	3	4	5	6	7	8
1	Lawngtlai	20	5108	2840	102	2942	20
2	Sangau	19	3321	1960	124	2082	35
3	Diltlang	48	5370	3720	412	4132	12
4	Chawngte	20	3155	1600	205	1805	15
5	Borapansuri	15	1760	1580	220	1800	7
6	Damdep	44	3720	2590	267	2867	32
		166	22434	14290	1330	15620	121

Source: Agriculture Statistical Abstract 2009-2010



From Fig-4 the total number of Jhum cultivator family in 2008-2009 is 63.69 per cent, it increases to 69.89 per cent in 2009-2010 and falls to 62.01 per cent in 2010-2011. On the mean time, the total number of WRC cultivator family in 2008-2009 is 5.9 per cent; it increases to 9.3 per cent in 2009-2010 and falls to 8.8 per cent in 2010-2011.The total number of cultivators' family explains that in 2008—2009 jhum cultivators' families' forms 91.4 per cent and WRC cultivator families form 8.5 per cent. In 2009-2010 jhum cultivators family's forms 88.2 per cent and WRC cultivator families form 11.7 per cent. In 2010-2011 jhum cultivators family's forms 87.5 per cent and WRC cultivator families form 12.4 per cent. In 2008-2009, 69.62 per cent of the total household belong to cultivator family. Where in 2009-2010, 79.17 per cent of the total household belong to cultivator family. Also in 2010-2011, 70.85 per cent of the total household belong to cultivator family.

Therefore, it can be studied that number of cultivator's family increase from 2008 to 2011, the number of jhum cultivator family fall awhile the WRC cultivators increase. But the increase per cent is less that it shows no significant changes. Moreover, according to this report Lawngtlai District is among the largest jhum cultivators family in Mizoram, but comparing to other district it acquired low output.

Slope and Altitude: The region is characterized by the hilly rugged terrain .The ridges show serrated tops, which are highly dissected and separated by intervening 'V' shaped narrow valleys. The hill ranges aligned North-South direction and the slope aspects are mostly eastern and western with a few exceptions in some parts of the area. The hill side slopes of the District are steep to very steep and escarpments are common. The western side consists of numerous dissected low hills with strongly sloping to steep slopes. The biggest valley is chamdur valley.

The altitude of the area is generally increased towards the East. The highest peak in the district is Paithar Tlang with an altitude of 1466 metres above mean sea level. Other high peaks are Lungtat Tlang(1180m) Mampuitlang(1157m) etc.

Land use pattern: The major land-use dentified within Lawngtlai District are Built-up land, Agriculture land, Forest, water bodies and others(current shifting cultivation)Wetland rice cultivation is practiced in the flood plains of Chhimtuipui River,Tuichawng River,Ngengpui River and Thega River. Rice (orya sativa) is the only crop cultivated during the kharif season. During Rabi season, some vegetables like mustards, cauliflowers etc are cultivated in small patches of valley fields in a scattered manner. Agricultural/horticultural plantations like orange, banana, pineapple etc. have been practiced near habitations in various places. The total area under cropped land, excluding shifting cultivation is of the order of 859.45 hectares or 0.19 per cent of the total area.

Principal crops: The major crops in the district are rice, corn, vegetables, horticultural crops and sugarcane. In terms of productivity, the average yields of principal crops are lesser than the state average.

The economic status of district is the lowest in compared with other districts in Mizoram. Attempts had been made by the Autonomous District Councils (LADC/CADC) to uplift the method of agriculture and replacement of shifting cultivation by wet rice cultivation (WRC) in the western area of the district called ‘Chamdur Valley Project’. Further in the western belt of the area, there are vast fertile plains which are highly potential for agricultural purposes in the valleys of the two rivers.

Table-3.9 LAND USE STATISTICS OF LAWNGTLAI DISTRICT, MIZORAM

Sl. no	Particulars	2010-2011	2011-2012
1	2	3	4
I	Geographical Area	255.710	255.71
II	Reporting area for Land Utilization statistics (1-5)	255.710	255.71
1	Forests	185.597	185.597
2	Not available for cultivation (a+b+c+d)		
	a) Water logged land	-	-
	b) Social Forestry	6.598	6.598
	c) Land under still water	1.786	1.786
	d) Other land	3.250	3.263
	Total of (a+b+c+d)	11.634	11.647
2(a)	Barren & unculturable land	1.020	1.02
	Total (2 + 2a)	12.654	12.667
3	Other uncultivated land excluding fallow land (a+b+c)	6.039	7.5
	a) Permanent pastures and other grazing land	0.500	0.5
	b) Land under miscellaneous tree-crops and groves not included in net area sown.	5.309	6.77
	c) Culturable waste	0.230	0.23
4	Fallow land (a+b)	40.078	38.183
	a) Fallow land other than current fallow	29.825	32.022
	b) Current fallow	10.253	6.161
5	Fallow land other than current fallow	11.342	11.763
6	Total Crop area	11.592	12.07
7	Area sown more than once	0.250	0.307
III	Net Irrigated Area	1.253	1.36
IV	Gross Irrigated Area	1.260	1.639

Source: I. Agriculture Statistical Abstract 2010-2011

II. Agriculture Statistical Abstract 2011-2012

3.4 Policies and Programme related to shifting cultivation implemented by the State Government.

- ***New land use policy (NLUP)***

Since 1987 after becoming full-fledged state, several initiatives aiming at development with emphasis on Jhum Control did not yield any positive result for lack of focus, faulty planning and inadequate plan funds. In 1985-1991 New Land Use Policy was introduced on a modest scale for Jhum Control initially confining to 4 blocks only namely W.Phaileng, Reiek, Thingsulthliah, Lungsen. An integrated approach comprising all sectors like Agriculture Animal Husbandry, Sericulture etc. alongwith non-farm sector like cottage Industries was made for inclusive rural development. During 1985-1991, 14,271 families were covered and thereafter 1991-92 another 15,863 families were covered. Funds released for 1985-1991 and 1991-1992 were Rs. 1131.288 lakhs and Rs. 984.765 lakhs during the first NLUP period. First NLUP launched in 1985 despite shortcomings favourably impacted rural economy as was evaluated by an independent church organization in 1992.

The Government of India first initiated such a move during the 1st Five Year Plan (1951-56). The Village Council Act of 1953, through which Village Councils were given wide ranging powers for the management of land, was the first empowerment of a local Government for land management in Mizoram. Then there came the Lushai Hills District (Jhumming) Regulation Act of 1954. Post 1972, after Mizoram was accorded the status of Union Territory, the various Mizoram Governments had tried to control the prevailing traditional jhum cultivation until 1984 when the idea of a New Land Use Policy was conceived by the then Congress ministry. The broad and primary aims and objectives are as follows:

1) Provide sustainable income to farming families who comprise nearly three-fourths of the total population of Mizoram by weaning them away from the destructive and unprofitable shifting cultivation practice
2) Provide urban poor with livelihoods by encouraging small scale industries and petty trades
3) Converging schemes funded by the Government of India (Centrally Sponsored Schemes) to NLUP for better utilization of funds and avoidance of duplication of works
4) Land reclamation and forestation by introducing permanent farming systems and land reforms
5) Environment protection and restoration through various means such as expansion of rain catchment areas for recharging rivers, springs and underground water, encouraging rearing of domestic animals and poultry for increased meat production to discourage hunting to protect the fauna etc

Therefore, NLUP Programmes aim at transforming Mizoram economy by progressively switching over from traditional Jhum practices to permanent farming, households engaged in Jhum to adopt more sustainable land use system, to increase farmer's access to irrigation facilities, quality inputs (seeds), crop diversification, non-farm earning opportunities and disposal of marketable surplus through remunerative markets and setting up of processing units**.**

- ***Mizoram Intodelhna Programme (MIP)***

It had commenced with effect from the year 2004-2005. In MIP activities in all 53,288 families from 228 villages were given financial assistance. In the 1st phase beneficiaries were given financial assistance of Rs. 7500 per beneficiaries and in the

2nd phase assistance was reduced to Rs. 4000/- only. Total amount released in programme under MIP was Rs. 30.38 crores. MIP, though the concept, was good could not make any headway as the quantum of assistance was too small, the involvement of line departments critical for success of such programmes were minimal and more importantly frequent changes in the programmes and guidelines created confusion and the whole programme finally went awry. NLUP launched in 1985-91 was replaced by Mizoram Intodelhna Programme (MIP) in 2002.

- ***Watershed Development Project in Shifting Cultivation Area (WDPSCA)***

As reported by Indian Council of Agricultural Research (ICAR) Complex for North Eastern Hill Region, Shillong, Meghalaya, about 14.66 lakh ha. area is affected by Shifting Cultivation mainly in States of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura as per the State- wise extent given in Annexure-I. The Planning Commission approved implementation of Scheme of Watershed Development Project in Shifting Cultivation Areas (WDPSCA) in seven States of North Eastern Region, namely, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura with 100% special Central assistance to the States as per directions of National Development Council (NDC) in 1994-95.

Watershed Development Programme in Shifting Cultivation Areas is a Special Central Assistance to State Plan Programme for the benefits of the jhumia families in the N.E. States who are living below poverty line. The financing of the scheme includes treatment of arable and non-arable land, drainage line, creation of water bodies, development of Agriculture/ horticulture/ plantation crops/ forestry and land based/ household production system as package of rehabilitation components. As a

whole the focus is on natural resources management, economic enhancement, leading to poverty alleviation and eco friendly living.

The main objectives of the watershed development project were (i) to protect and develop hill slopes of jhum areas through different soil and water conservation measures on watershed basis and reduce further land degradation process, (ii) to encourage and assist jhummia families to develop jhum land for productive use with improved cultivation and suitable practices, (iii) to improve the socio-economic status of the people through household/land based activities; and (iv) to mitigate the ill effects of shifting cultivation by introducing appropriate land use and water management technologies.

- ***Oil Palm Development***

The rapid increase of land degradation due to jhumming, deforestation, loss of biodiversity and productivity, increasing flood are leading to an ecological crisis affecting livelihood options for Jhumia families. This suggests inter-alia policy toencourage and support plantation of Oil Palm to overcome these constraints. Oil Palm stands zas an ideal crop capable of achieving conservation of soil and moisture, repair of degraded land, provide ecological balance, food and security of rural and urban poor. The Government of Mizoram aims to implement and action Programme with an objective of placing Oil Palm as a key component in the plan to generate employment and mitigate environmental degradation and to strengthen the process of Oil Palm Development. In the recent past, the cultivation of Oil Palm had been tried in Assam,Tripura and Mizoram with considerable success. In Mizoram 5,000 nos. and 7'000 nos. of seedlings of Oil Palm were planted at Rotlang area of Lunglei district and Thingdawl area of Kolasib district during 1999-2000, respectively, with promising results. Thereafter, the Government of Mizoram has decided to undertake

Oil Palm cultivation. The Total potential area identified in 7 (seven) Districts of Mizoram comes to1, 01, 000 hectares at low elevation with gentle slope (25-33 %) having favourable Agro-climatic condition.

Adaptability of Oil Palm Cultivation in Mizoram.

The Technical Experts from NRC-OP, who studied the suitability of agroclimatic condition and water availability required for Oil Palm Cultivation in Mizoram, has recommended that *"Climate and soil condition in the southern Mizoram having low elevation and gentle slopes are quite suitable for Oil Palm cultivation".* The growth of the existing plants which are planted during 1999-2000 exhibited vigorous growth showing good FFB production at different locations. Government of Mizoram has therefore decided to undertake large scale cultivation of Oil Palm from 2004-2005 during Xth Plan Period.

Objectives of the Oil Palm Development Programme:

i) To create income generation opportunities for small and marginal farmers.

ii) To reverse the degradation process and achieve eco-balance to sustain land and water use.

iii) To motivate farmers to switch over from jhum cultivation to permanent settlement.

Expected outcome:

i) The existing practice of Jhum Cultivation is not productive and proposed to be replacing by the Oil Palm Cultivation for higher production and productivity.

ii) Income of the farmers will be generated in considerable extent with the introduction of Oil Palm.

iii) A part of citrus decline area which is unutilized at present could be conveniently converted into Oil Palm.

iv) In jhum cultivation, no soil conservation measures in possible. However, with the introduction of Oil Palm necessary soil and water conservation measures could be taken up in the plantation area.

v) A good number of educated unemployment youth will find employment in Rural Sector.

vi) Oil Palm Cultivation will convert jhum area into permanent settlement with greater employment opportunity and higher income to farmers.

- ***Crop production and productivity improvement*:**

There is a significant decrease in jhum cultivation over the past few years due to the implementation of NLUP, Watershed Development Programme for Shifting Cultivation Areas (WDPSCA) under Macro Management of Agriculture, diversification of Agriculture by promoting cultivation of cash crops like sugarcane, oilseeds and promotion of Oil palm development programme both under ISOPOM and RKVY respectively. Whereas the area under Jhum cultivation was 44,947 ha, at the beginning of 11th Plan, at the end of 11th plan (2011-12), only 25,826 ha was recorded. Significant achievement has also been made during 2012-13 towards reduction of Jhum cultivation. There is 10.36 per cent decreased in jhum area during 2012-13 (23,150 Ha) against 25,826 ha during 2011-12. Marginal increase in WRC Area has also been recorded from 9,446 ha, at the beginning of 11th Plan to 12,700 ha during 2011-12. Increase in WRC area during 2012-13 is recorded which account for 5.26 % increased over the preceding year (2011-12). With the introduction of improved technology, the productivity of Rice under WRC has increased from the level of 1.5 MT/ha,at the beginning of 11th Five Year Plan to 2.0 MT/ha during 2011-12. The productivity of Rice under jhum and WRC during Kharif 2012-13 also

recorded increasing trends which is attributed to the higher seed replacement rate, adoption of integrated cropping management.

3.5 CONCLUSION

The Mizo's are divided into numerous tribes, the largest of which are possibly the Lushais, that comprise almost two-thirds of the state`s population. Other tribes include Hmar, Mara, Paite, Lai, Ralte. Mizos are divided into numerous tribes, the largest of which are possibly the Lushais, that comprise almost two-thirds of the state`s population. Other tribes include Hmar, Mara, Paite, Lai, Ralte.

The Mizo's cling to their rich cultural heritage, colourful customs and their lively traditions. The festivals and dances of the Mizos have a unique tribal flavour. Other than Christmas and New Year's Day which are the most popular festivals, Chapchar Kut, a festival marking the end of the laborious clearing of jungles for the year's cultivation during the first week of March, is another occassion celebrated with much gusto. The most popular dances of Mizoram are Cheraw (Bamboo Dance), Khual Lam (Dance for Guests) and Chheih Lam (Dance of Joy).

Since agriculture is the main occupation of the Mizo's who practice jhum or shifting cultivation. The government has now introduced new and modernized systems of cultivation with the intention of weaning the people over to permanent cultivation. Mizoram is famous for its production of fibreless ginger which thrives well in the state. Paddy, maize, mustard, sugarcane, sesame, potatoes and grapes are the main crops produced in the state

References

Goswami, K., Choudhury, H. K., & Saikia, J. (2012). Factors influencing farmers' adoption of slash and burn agriculture in North East India. *Forest Policy and Economics*, *15*, 146-151.

Government of Mizoram (2010). Agriculture Statistical Abstract 2009-2010. Directorate of agriculture (Crop Husbandry).

Government of Mizoram (2011). Agriculture Statistical Abstract 2010-2011. Directorate of agriculture (Crop Husbandry).

Government of Mizoram (2012). Agriculture Statistical Abstract 2011-2012. Directorate of agriculture (Crop Husbandry).

Government of Mizoram (2010). Statistical Handbook, Mizoram 2010, Directorate of Economics & Statistics

Government of Mizoram (2012). Statistical Handbook, Mizoram 2010, Directorate of Economics & Statistics

Government of Mizoram (2012). Economic Survey Mizoram 2012-2013, Planning & Programme Implementation Department.

Jha, L. K (1997). *Shifting Cultivation.* New Delhi: APH Publishing. Pp 8-10

Mahajan, V.S., (1990).*Mizoram's jhum revisited, In: Shifting Cultivation in North-East India,* Majumder, D.N., ed., New Delhi, Omsons Publications, pp.229-36.

Tawnenga. (1990).*Studies on Ecological Implication of Traditional and Innovative approaches to Shifting Cultivation in Mizoram*. PhD Thesis, North-Eastern Hill University, Shillong, India

Web References

Census2011 (2011).Lawngtlai District: Census 2011 data. http://www.census2011.co.in/census/district/392-lawngtlai.html (Retrieved June 8th 2014).

Agriculture Department (Crop Husbandry), Lawngtlai district. http://agriculture mizoram.nic.in/downloads.html. (Retrieved June 8th 2014)

Rashtriya Sam Vikas Yojana Project, Lawngtlai District http://lawngtlai.nic.in/ RSVP /profile.htm (Retrieved june 8th 2014)

Deputy Commissioner, Lawngtlai. http://lawngtlai.nic.in/index.htm (Retrieved April 6th, 2013)

Department of Tourism, Govt. of Mizoram. http://tourism.mizoram.gov.in/page/chapchar-kut.html (Retrieved June 9th 2014)

Department of Tourism, Govt. of Mizoram.http://tourism.mizoram.gov.in/page/thalfavang-kut.html (Retrieved June 9th 2014)

CHAPTER 4

EFFECTS OF SHIFTING CULTIVATION ON SOCIAL LIFE OF THE JHUMIAS

CHAPTER 4: EFFECTS OF SHIFTING CULTIVATION ON THE SOCIAL LIFE OF THE JHUMIAS

4.1 INTRODUCTION

Shifting cultivation has a special relevance in the form of moral code, philosophy and values for shifting cultivators. Tribal values orientation is the prime factor for the continuance of shifting cultivation[24]. In this chapter an attempt has been made to study the socio-economic condition of the jhumias in Lawngtlai District. Data for assessing the socio-economic conditions of the Jhumias were drawn from a comprehensive survey of villages from three development blocks in Lawngtlai District, it was kept in mind that these block were a good representation of Jhumias. Out of 158 villages in Lawngtlai District 11 villages are sampled and 3 within the Lawngtlai town area.

This traditional farming system linked with ecological, socio-economic and cultural life of indigenous people and closely concerned to their sacrament and festival that revolve their jhum fields and are organized to make place at various stage of the cultivation[25].

The perception of the jhumias toward their jhuming practice is also added in this chapter. This chapter is based on primary data.

[24] Jha, L. K (1997). *Shifting Cultivation.* New Delhi: APH Publishing.pp 39.
[25] Yadav PK (2013). Slash-and-Burn Agriculture in North-East India. Expert Opin Environ Biol 2:1

4.2 SOCIO-ECONOMIC CONDITION OF THE JHUMIAS

The social and economic condition of the jhumias is done on the following measures and parameter, which are as follows:

4.2.1 Family size:

As shown in Table-4.1, the primary data covers 1818 numbers of persons out of 287 sample sizes. Here, 56.65 per cent of the population are adult members that are above the age of 18 years, and while 42.57 per cent are minor members below the age of 18 years. Moreover, 43.83 per cent of the total population are workers while the rest are students, retired, infants etc. Therefore, the average family size of the jhumias constitutes 6.4 persons per family.

Table 4.1: Categorical Distribution of the Jhumia Family Members in the Study area.

Sl. No	Members' Category	No. of Households Reported	No. of Persons Covered	Per cent of Total Member
1	Adult Member	287	1030	56.65
2	Minor Member	287	788	43.35
3	Total (1+2)	287	1818	100
4	Workers	287	799	43.83
5	Average Family Size	287	6.4	

Source: Based on Field Survey (20013-2014)

4.2.2 Poverty Status

The poverty status of the Jhum Cultivators in the study area shows that 40.42 per cent of the Jhumias are Above Poverty Line (APL), where 34.15 per cent of the Jhumias are Below Poverty Line (BPL) and 25.44 per cent of the Jhumias are (AAY).

Table-4.2: Poverty status of the Jhum Cultivators in the study area.

Sl. No	Status	No. of Households	Per cent
1	AAY	73	25.44
2	APL	116	40.42
3	BPL	98	34.15
	Total	287	100

Source: Based on Field Survey (20013-2014)

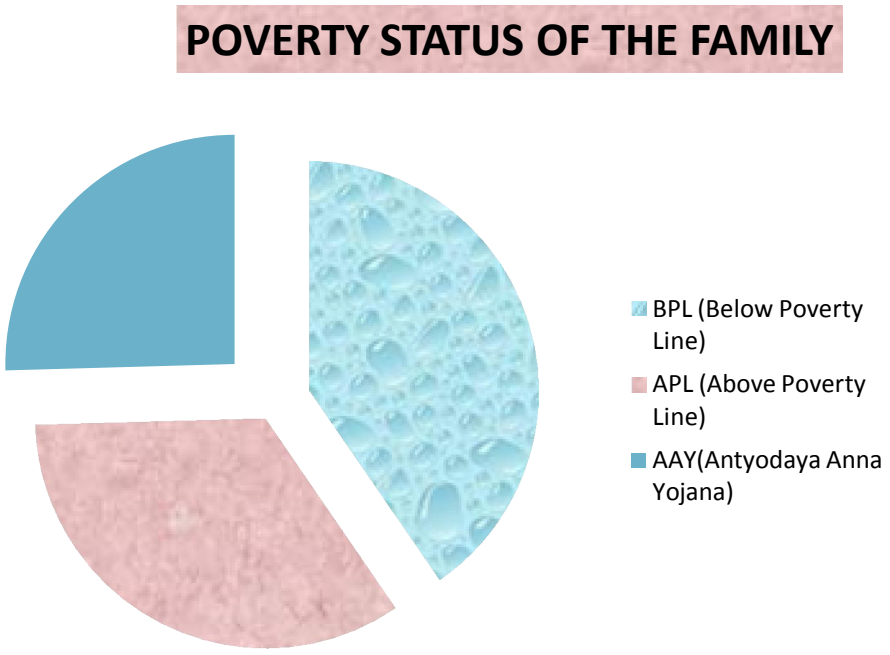


Figure 4.1: Exploded Pie showing poverty status in the study area

4.2.3 Religion

The majority (87 per cent) of Mizo's are Christian in various denominations. Mizoram population has 8.3 per cent Buddhists making them the largest minority, followed by Hindus at 3.6 per cent according to the 2001 census. Muslims make up about 1.1 per cent of the state population. The remaining 3,000 people are Sikhs,

Jains and other religions[26].Christianity has emerged as the major religion in Mizoram. Table- 4.3 shows that 94.77 per cent of the jhumias belong to Christian or Christianity, while the remaining 5.23 per cent belong to Buddhism.

Table-4.3: Religion of the Jhum Cultivators in the Study Area

Sl. No	Religion	No. of Households	Per cent
1	Buddhism	15	5.23
2	Christian	272	94.77
	Total	287	100

Source: Based on Field Survey (20013-2014)

In Mizoram, the major Christian denominations are Presbyterian (majority), Baptist, United Pentecostal Church, The Salvation Army, Lairam Jesus Christ Baptist Church (LIKBK), Seventh-day Adventist, Evangelical Church of Maraland (ECM), Congregational Church of India (Maraland) in the southern district of Saiha, Roman Catholic and Pentecostal churches etc.

Table-4.4 shows that most of the Jhumias in the study area belong to Lairam Jesus Christ Baptist Church (LIKBK) and Baptist Church of Mizoram (BCM) denominations. It constitutes 37.5 per cent and 28.30 per cent respectively. While 8.08 per cent belong to Presbyterian (Synod), 7.34 per cent belong to United Pentecostal Church North-East (UPC), 4.7 per cent belong to Evangelical Free Church of India (EFCI), 4.4 per cent belong to Jesu Krihfa Bu (JKB), 3.3 per cent belong to United Pentecostal Church Mizoram (UPC), 2.2 per cent belong to Community Bible Church (CBC), 0.72 per cent belongs to Seventh-day Adventist and 0.72 per cent belongs to Isua Krista Kohhran (IKK).

[26] Mizoram From Wikipedia, the free encyclopedia (www.wikipedia.org)

Table-4.4: Christian Denominations of the Jhumias

Christian Denominations	No. of household	Per cent
LIKBK	104	37.5
BCM	77	28.30
UPC (NE)	20	7.34
UPC (MZ)	9	3.3
IKK	2	0.72
Synod	22	8.08
Catholic	5	1.83
EFCI	13	4.7
CBC	6	2.2
JKB	12	4.4
Adventist	2	0.72
Total	272	100.0

Source: Based on Field Survey (20013-2014)

4.2.4 Social status:

Table 4.5: Social Group of the Jhumias.

Sl. No	Social Group	No. of Households	Per cent
1	Scheduled Tribes	273	95.12
2	Scheduled Castes	0	0
3	Other Backward Classes	0	0
4	Others	14	4.88
	Total	287	100

Source: Based on Field Survey (20013-2014)

According to 2011 census, Mizoram had 1,036,115 people (95% of total) classified as Scheduled Tribe, the highest concentration of protected tribal people in all states of India.

The Table-4.4: showing the social status of the Jhumias indicates that the dominant social group are Scheduled Tribes constituting 95.12per cent of the total population, while 4.88per cent belongs to others. 'Others' here refers to refugees etc.

4.2.5 Main Occupation.

Population Census 2001 reveals that out of the total population of 8, 88,573 in Mizoram, 52.57 per cent i.e. 4,67,159 were workers and the rest 4,21,414 were non-workers. The proportion of workers has gone up from 48.9 per cent in 1991 census to 52.6 per cent in 2001 census. It also reveals that proportion of workers was higher in the rural areas at 55 per cent than in the urban areas which have about 45 per cent of all workers. Also, female working population constitute about 44 per cent of total workers and the share of male working population was about 56 per cent. As per Census 2001 60.6 per cent of the total workers are engaged in agricultural activities.

In Lawngtlai District, according to the population census 2001 of the per centage of the total main workers, 71.52 per cent are Cultivators, 3.09 per cent are agricultural labourer, 0.99 per cent is workers in household industries and 24.40 per cent are other workers.

Table-4.6: Whether Jhumming is the main activity of the households?

Sl. No	Cases	No. of Households	Per cent
1	NO	89	31.01
2	YES	198	68.99
	Total	287	100

Source: Based on Field Survey (20013-2014)

The study reveals that for 68.99 per cent of the household jhum cultivation is the main activity or occupation, while for 31.01 per cent jhum cultivation is not their main activity or occupation.

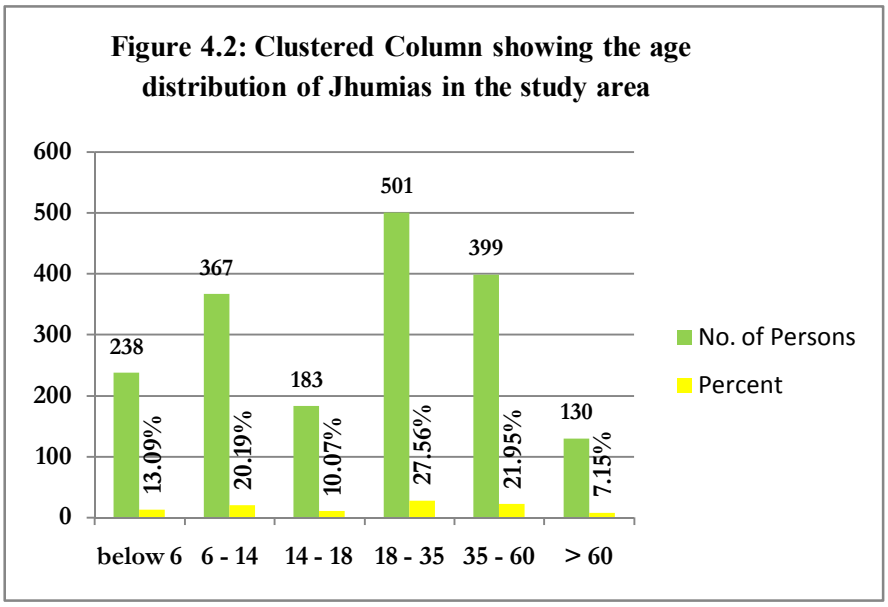
4.2.6 Age Distribution.

Table-4.6 of the age group distribution of the jhumias families shows that 13.09per cent are below 6 years, 20.19per cent are between 6-14 age group, 10.07per cent are between 14-18 age group, 27.56per cent are between 18-35 age group, 21.95per cent are between 35-60 age group and 7.15per cent are above 60 years.

Table-4.7: Age Distribution of the Members of Jhumia Families

Sl.no	Age Group	No. of person	Per cent
1	below 6	238	13.09
2	6 - 14	367	20.19
3	14 - 18	183	10.07
4	18 - 35	501	27.56
5	35 - 60	399	21.95
6	Above 60	130	7.15
	TOTAL	1818	100

Source: Based on Field Survey (20013-2014)



4.2.7 Education

The illiterate covers those who cannot read nor write. Infant refers those who are not in a stage for school yet. The Primary level here covers between 1-4 standard. The Middle School covers between 5-8 standard, the High school are those in 9 and 10 standards, higher secondary are those in 11 and 12 standards and vice versa.

The study of the educational levels/attainments of the members of the Jhumias families in the study area shows that 29.21 per cent studied till 1-4 standard, 20.19 per cent studied till 5-8 standard, 16.84 per cent are illiterate, 15.18 per cent studied 9-10 standard, 13.26 per cent are infant or not yet attain school, 3.41 per cent studied higher secondary school, graduation are 2.59 per cent and 0.33 per cent are Post graduate.

Table-4.8: Educational Levels/Attainments of the Members of the Jhumia Families in the Study area

Sl. No		No. of Persons	Per cent
1	Illiterate	288	15.84
2	Infant	241	13.26
3	Primary Level	531	29.21
4	Middle School	367	20.19
5	High School	276	15.18
6	Higher Secondary	62	3.41
7	Graduate	47	2.59
8	Post Graduate	6	0.33
	Total	1818	100

Source: Based on Field Survey (20013-2014)

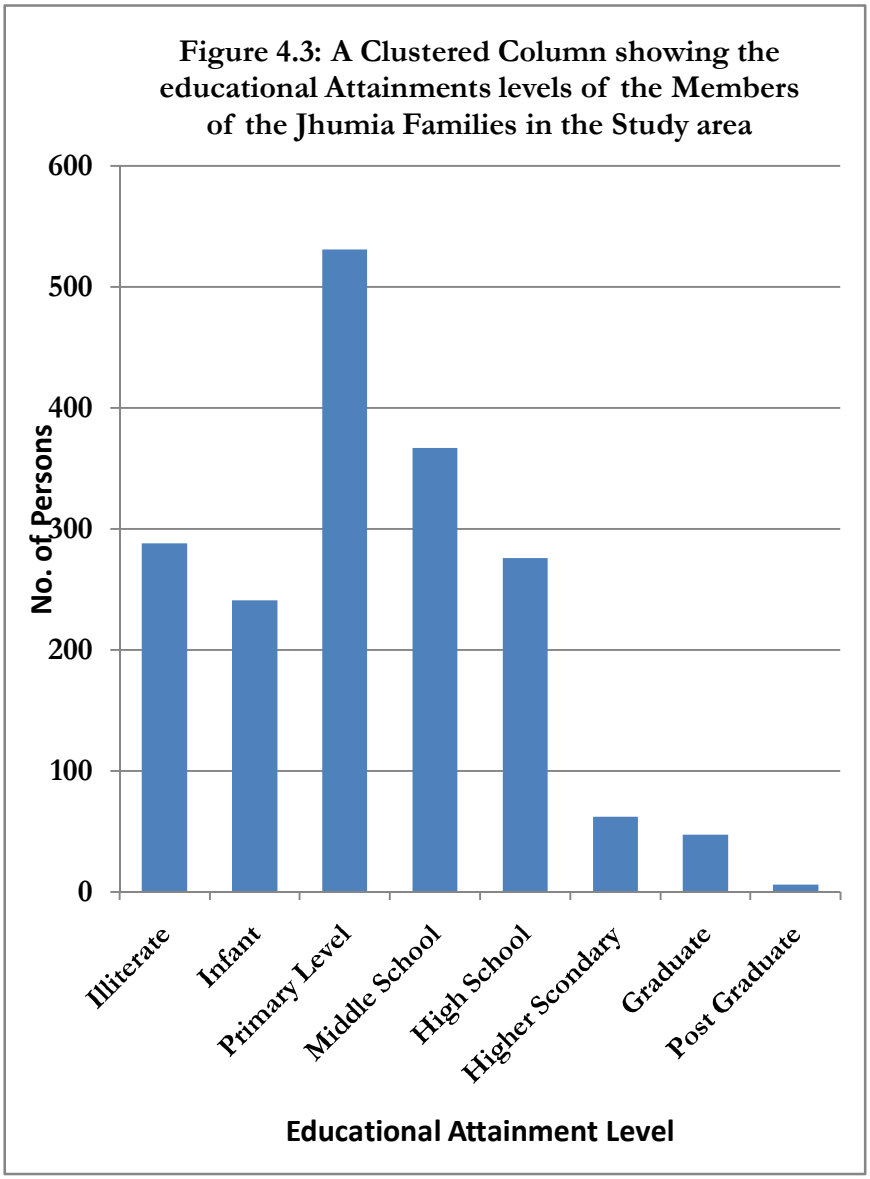


Figure 4.3: A Clustered Column showing the educational Attainments levels of the Members of the Jhumia Families in the Study area

4.2.8 Main activities of the Jhumias family

The activities can be describe that by agriculture it means the persons who engage in only agriculture work, housekeeping here point to house makers .The activity retired here contains even all the other activity holder but have retired at present due to old age or health problems. The activity business here refers to those activity like petty shop making, personal business etc which are non-government and private. The farm labour refers to those daily labour who engage only in farm works

and non-farm labour are those daily labour engage in non-farm works like carpentry(thingzai), house construction(in sak), tailoring etc. The Service activity holds to those Government employees. The student are the educational studies of different prospects, diplomas course etc. The unemployed here means those who are not performing any of the other activity and are not engage in any other work or are jobless. The religious work refers to the priest and Pastor and even those church keeper who are finance from that. The other profession includes occupation like driver, thirdeng etc. Those 'not applicable' refer to those infant or who are not at age to attend school to fall under student activity.

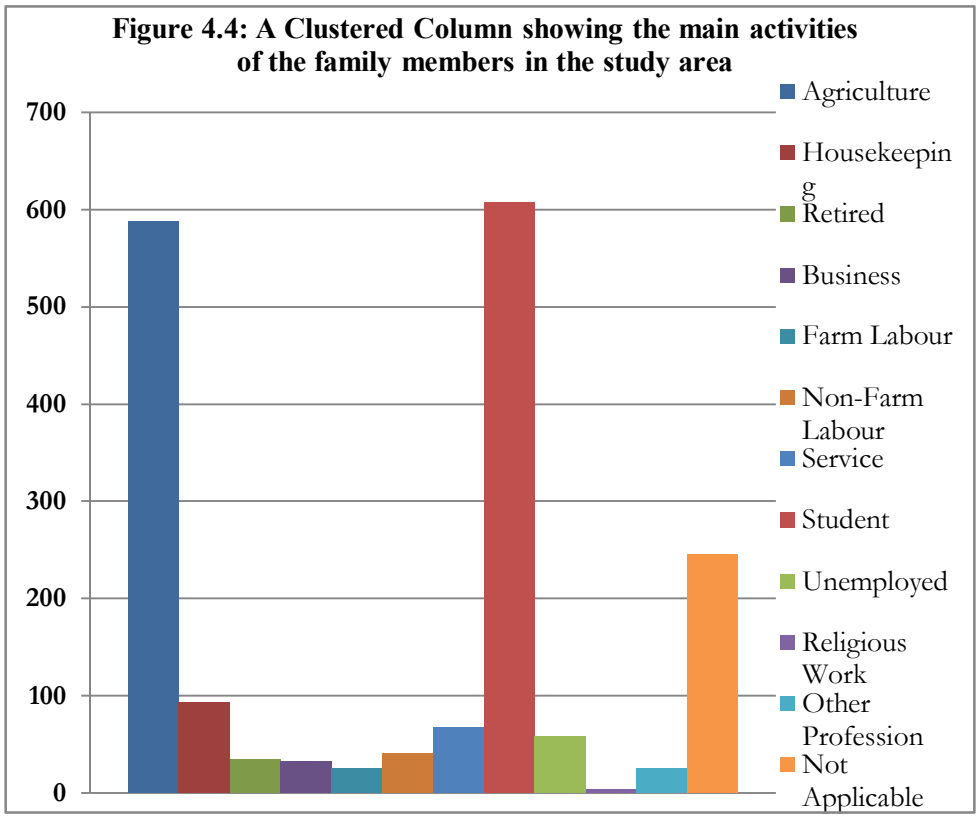
Table-4.9: Main activities of the Family Members in the study area.

Sl. No		No. of Persons	Per cent
1	Agriculture	588	32.34
2	Housekeeping	93	5.12
3	Retired	34	1.87
4	Business	32	1.76
5	Farm Labour	25	1.38
6	Non-Farm Labour	41	2.26
7	Service	67	3.69
8	Student	607	33.39
9	Unemployed	58	3.19
10	Religious Work	3	0.17
11	Other Profession	25	1.38
12	Not Applicable	245	13.48
	Total	1818	100

Source: Based on Field Survey (20013-2014)

The study of the main activities of the family members in the study area shows that 33.39 per cent are student, 32.34 per cent are engaged in agriculture, 13.48 per cent are not applicable like infant etc, 5.123 per cent are housekeeper, 3.69 per cent are government servants, 3.19 per cent are unemployed, 2.26 per cent are non-farm labours, 1.87 per cent are retired, 1.76 per cent are engage in business men

or women, 1.38 per cent are engage in farm labour, 1.38 per cent are engage in other profession and 0.17 per cent are engage in Religious work.



4.2.9 Annual Income

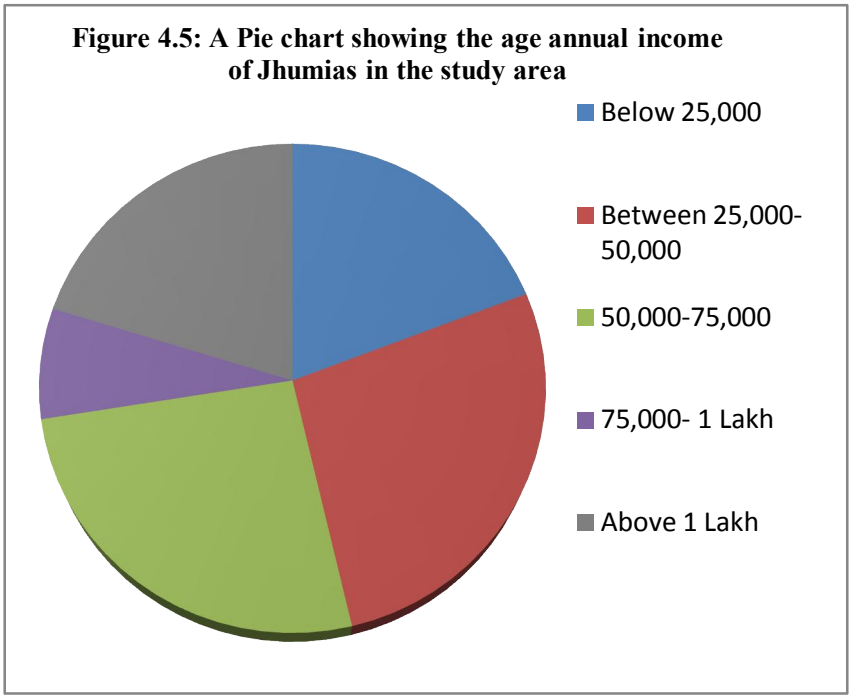
In Lawngtlai District Agriculture & Allied activities occupied the most important occupation accounting for 75 % of the population depended on it directly or indirectly for their livelihood. Service sectors offer other employment opportunities for about 20 % of the population and only about 5 % of the population engaged themselves in secondary sector. Apart from depending on agriculture for their livelihood, majority of the agricultural population took up other economic activities to supplement their income.

Table-4.10: Annual Income Range of the Jhumias

Income Range	No. of household	Per cent
Below 25,000	55	19.2
Between 25,000-50,000	78	27.2
50,000-75,000	75	26.1
75,000-1 Lakhs	21	7.3
Above 1 Lakhs	58	20.2
TOTAL	**287**	**100**

Source: Based on Field Survey (20013-2014)

Figure 4.5: A Pie chart showing the age annual income of Jhumias in the study area



The study shows that 19.2 per cent of the jhumias have an annual income below 25,000, 27.2 per cent have an annual income between 25,000 - 50,000, 26.1 per cent have an annual income between 50,000-75,000, 7.3 per cent have an annual income between 75,000 – 1 Lakhs, 20.2 per cent have an annual income above 1 Lakhs. From figure-4.5 it is clear that the Jhumias annual income mostly range between 25,000-75, 000.

4.2.11 Festivals associated with shifting cultivation

Out of the festivals which are associated with shifting cultivation, the three state main festival i.e Chapchar Kut is still annually celebrated but Mim kut is replaced by Thlai thar Kut since Christianity was followed by the Mizo's. Bizu is the most important socio-religious festival of the Chakma. This festival gave birth to the Bizu dance. The 'Thalfavang Kut' festival is celebrated in November. The festival is celebrated before harvest to celebrate the completion of farming while waiting for the tough task of harvesting. The festival is celebrated by the farmers as cultivation is the major livelihood of this state.

Therefore, table-4.11 shows that half of the Jhumias celebrate Chapchar kut, and 38.3 per cent celebrate Thlai thar kut, while 5.6 per cent of the jhumias celebrate Bizu. 1.4 per cent of the jhumias celebrate Thal favang Kut. Moreover, Bizu festival is only celebrate by the Chakma, thlai thar kut is celebrated only by the Christians, while Chapchar kut and Thal favang kut is celebrated as a state main festivals.

Table-4.11: Festivals associated with jhum

Sl. no	Festivals	No. of household	per cent of household
1	Chapchar Kut,	157	54.7
2	Thlai thar Kut	110	38.3
3	Biju	16	5.6
4	Thal favang kut	4	1.4
	TOTAL	287	100.0

Source: Based on Field Survey (20013-2014)

4.2.12 Dwelling House

Table-4.12 shows that 94.8 per cent of the jhumias owned house for dwelling, 3.1 per cent are staying in a rented house and 2.1per cent fall under 'others' like those who didn't own a house nor stays in a rented house like those dwelling in a quarters etc.

Table-4.12: Dwelling House

Sl. No	Dwelling House	No. of household	per cent of household
1	Owned	272	94.8
2	Rented	9	3.1
3	Others	6	2.1
	TOTAL	287	100.0

Source: Based on Field Survey (20013-2014)

4.2.13 Other Allied Sources

The term 'Huan' is called garden in English, here it means to convey a plot of land that is not of jhum land where those land mostly belong to the farmers and where horticulture crops, fruits etc are grown. The study shows that 56.4per cent of the Jhumias have no garden beside their jhum land, while 42.9per cent engage in this Agriculture, 0.7per cent engages under the system called 'Nul', this take place near a lake or river and acquires only a small area of land and where kharif crops etc are grown.

Table-4.13: Other Allied Sources

Sl.no	Allied Source	No. of household	per cent of household
1	NO ALLIED SOURCES	162	56.4
2	HUAN	123	42.9
3	NUL	2	0.7
	Total	287	100.0

Source: Based on Field Survey (20013-2014)

The study in the field area Table-4.14 shows that 31.4 per cent are not engage in any livestock, where 22.3 per cent of the jhumias are engage in only poultry livestock, 13.6 per cent are engage in only piggery, where 31.7 per cent are engage in both poultry and piggery, where 1 per cent of the jhumias are engage in poultry, piggery and goats.

Table-4.14: Livestock

Sl.no	Livestock	No. of household	per cent of household
1	NO livestock	90	31.4
2	Poultry	64	22.3
3	Piggery	39	13.6
4	Both Poultry and piggery	91	31.7
5	Poultry,piggery,Goats	3	1
	Total	287	99.7

Source: Based on Field Survey (20013-2014)

Poultry, piggery and dairying are the major activities in the district in addition to agriculture. People take up animal rearing mainly to supplement their meagre income from agriculture.

4.2.10 Ethnicity of the Jhumias:

Mizoram exhibits a co-existence of different communities, such as the Mizo (Lusei, Gangte, Pawi, Lakher, or Mara), the Riang(*Tuikuk*), and the Chakma. Matupi and zotung are the Chin tribe of Myanmar, and 'Others' here refers to migrants from Myanmar called 'Kawl' in Mizo.

Table-4.15: Ethnic Groups of the Jhumias

Ethnic Groups	No. of household	Per cent
Lusei	15	5.2
Lai	187	65.2
Mara/Lakher	18	6.2
Hmar	2	.7
Chakma	24	8.4
Bawm\ Bru	30	10.5
Matupi\ Zotung	6	2
Other	5	1.7
Total	**287**	**100**

Source: Based on Field Survey (20013-2014)

The study shows that the 65.5 per cent of the ethnic groups of the jhumias belong to Lai. Lai (Pawi) who are living in the Lai Autonomous District of Mizoram are but a segment community of the much larger Lai (Hakha) population of Burma and elsewhere to whom whatever name may be given. However, the Lai people have been given various names in different places, Chin or Halkha in Burma, Zo or Laizo in different places in India, Bangladesh and elsewhere, Pawi or Mizo in Mizoram.

The ethnic groups Bru\ Bawm are the migrants from Bangladesh, where 10.5 per cent of the jhumias in the study area are BRU/ Bawm.

Chakmas are an indigenous Tibeto-Burman population of the Chittagong Hill Tracts in Bangladesh. The Chakmas are believed to be originally from Arakan who later on moved to Bangladesh, in the Indian states of Mizoram, Arunachal Pradesh, and Tripura. The 8.4 per cent of the jhumias in the study area belong to Chakma.

The Mara people are one of the Kuki tribes in India, native to north-eastern India, primarily in the Mara Autonomous District Council of the state of Mizoram,

where they form the majority of the population. Significant numbers of Maras are also found living south-eastern part of Burma, in Chin State and Rakhine State which border the district. They were earlier known as the *Lakher*. The 6.2 per cent of the jhumias in the study area belong to Mara.

The Lusei tribe are one of the eleven tribes of the Mizo people. The 5.2 per cent of the jhumias in the study area belongs to Lusei,

Others here refer to migrants from Myanmar called 'Kawl' in Mizo. They are the dominant ethnic group of Burma (Myanmar). The 1.7 per cent of the jhumias in the study area belongs to others.

Hmar is the name of one of the numerous Mizo tribes of India, spread over a large area in the northeast of India. Literally, Hmar means North or Northern people, as they are living north to the Lusei people. The 0.7 per cent of the jhumias in the study area belongs to Hmar.

Matupi is the second capital city, one of the townships of Chin State of West Myanmar, Southeast Asia. The name *Matupi* is directly derived from *Batupuei*; however, due to misreading of the spellings: *Ba* into *Ma* and *Puei* into *Pi* in Burmese characters, Matupi appeared to be the widely used name without any historical significance in its terminology. The Matu Chin tribe is one of the biggest tribes among the Kuki-Chin-Mizo. The 2.1 per cent of the jhumias in the study area belongs to Matupi/Zotung.

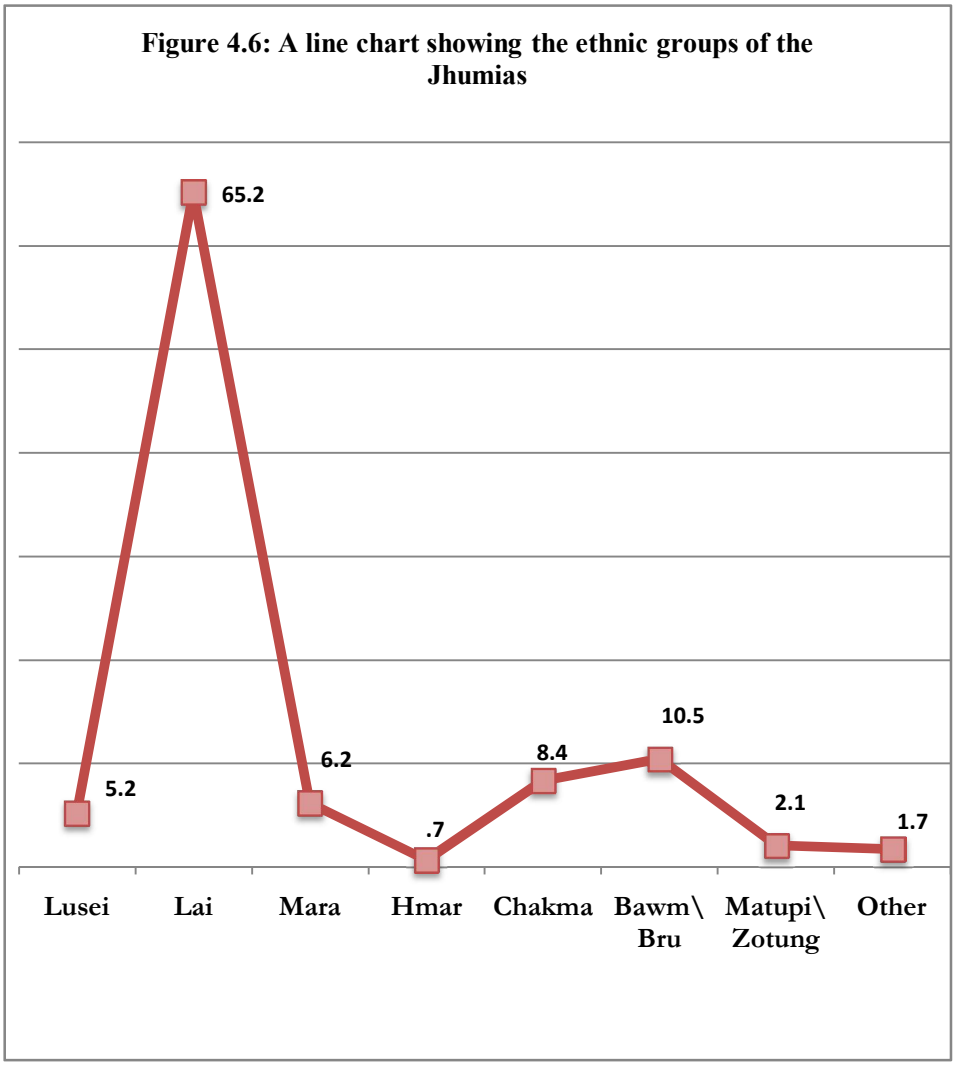


Figure 4.6: A line chart showing the ethnic groups of the Jhumias

4.2.11 Beneficiaries of NLUP or any other Government Programme

The study reveals that 60.6 per cent of the Jhumias are beneficiaries of NLUP, and where 39.4 per cent are not beneficiaries of NLUP or any other Government Programme.

Table-4.16: Whether Beneficiaries of NLUP or any other Government Programme

	No. of household	Per cent
YES	174	60.6
NO	113	39.4
Total	287	100.0

Source: Based on Field Survey (20013-2014)

According to the district wise beneficiaries of NLUP in the 1st Phase, 701 number of household are beneficiated from Lawngtlai District, i.e. 1052 (WRC-I), 390 (WRC-II), 168 (Oil Palm), 34 (Sugarcane). In the 2nd Phase, 1032 number of household are beneficiated from Lawngtlai District, i.e. 648 (WRC-I), 232 (WRC-II), 136 (Oil Palm), 16 (Sugarcane).

Table- 4.17, shows that 36 per cent of the beneficiated Jhumias choose trade under Animal Husbandry & Vety Department (Dairy cow farming,pig rearing,hill cattle/Mithun rearing,goat/Sheep rearing, poultry farming (Layer/Broiler) .

A1so, 9.42 per cent of the beneficiated Jhumias choose trade under Horticulture Trade such as Passion Fruit,Grapes, Mandarin Orange + Banana, Aloe Vera + Banana, Iskut (Squash), Arecanut, Tung and Pineapple. Thus, 14.25 per cent of the beneficiated Jhumias choose trade under Bamboos.

Under Agriculture Department 9.72 per cent choose this trade i.e WRC, Hill Terracing, Sugarcane and Red Oil Palm.

Under Fishery Department 8.57 per cent choose this trade, i.e Pisciculture

Under Industries Department 5.72 per cent choose this trade.This trade includes activities such as Carpentry, Blacksmithy,Rice Hulling, Chow making, Petty Trade,Shoe Repairing/Making, Tinsmithy, Photography/Videography,Steel Fabrication,Motor Works, Electronics Repairing, Tailoring, Draft Wood Processing, Desktop Publishing, Bakery, Agarbati Stick Making, Cane and Bamboo Work, Knitting,Handloom, Fruit Processing (home Scale), Spices Processing (Home Scale),Tea Processing (Home Scale) ,Compressed Stabilized Earth Block Making, Beauty Parlour, Hair Cutting, Auto Rickshaw 2 strokes & 4 strokes.

Therefore, 1.72 per cent chooses activities from soil and water conservation such as rubber plantation, coffee plantation and broom cultivation and 0.57 per cent chooses Sericulture i.e mulbery silk rearing.

Table-4.17: Different Trade of NLUP beneficiaries

Sl no.		No. of household	Per cent
1	Horticulture	34	19.42
2	Fishery Department	15	8.57
3	Sericulture	1	0.57
4	Animal Husbandry & Vety Department	63	36
5	Soil and water conservation	10	5.72
6	Agriculture Department	17	9.72
7	Industries Department	10	5.72
8	Bamboos	25	14.28
	Total	175	100.0

Source: Based on Field Survey (20013-2014)

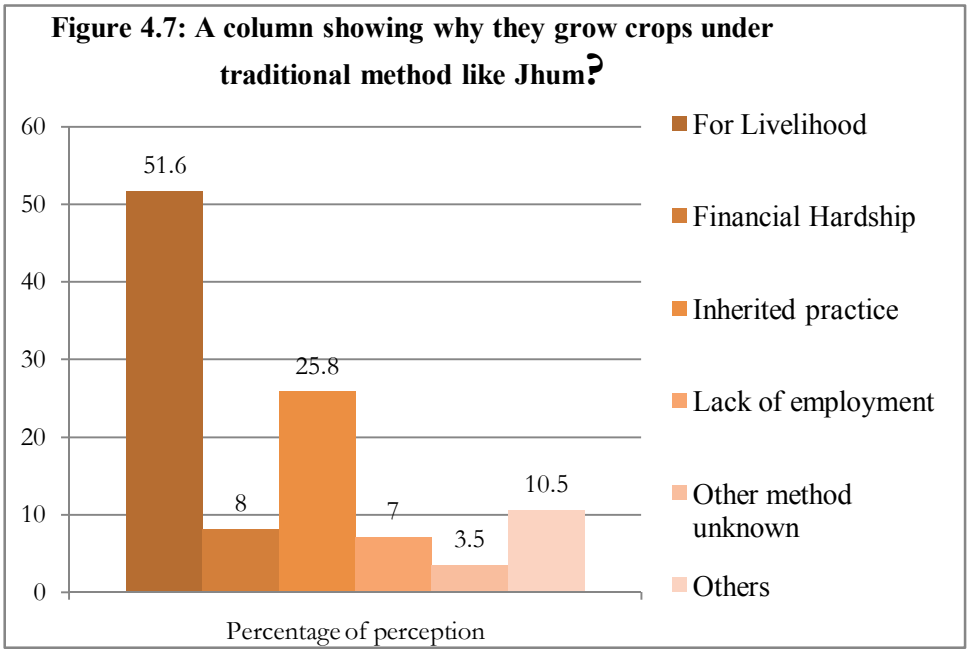
4.3 PERCEPTION OF JHUMIAS ABOUT JHUM CULTIVATION

The jhumias were ask their perception about jhum, it was build on the plan to get deep details of the agriculture cultivation on the term to investigate the experience level of the farmers and so as to highlight the lacking problem on different angle of its advantages and disadvantage. The perception results are all from the jhumias point of view and believe or experience.

4.3.1 Why do you grow crops under traditional method like Jhum?

The study on the perception of jhumias shows that 51.6 per cent of the jhumias grow crops under traditional method like jhum for livelihood, 25.8 per cent practice jhum farming as it is an inherited practice, 8.0 per cent practice due to financial hardship, 7 per cent practice due to lack of employment, 3.5 per cent due to ignorance about other method. Meanwhile, 10.5 per cent practice for other reasons, in which 46.43 per cent are because they want to be self sufficient in foods etc. Moreover, others here also refer to different statement which is because they desire to consume rice under jhum cultivation which is more fresh and good in taste. While it is believe that if one is in a village it is a must to grow crops under jhum, as it is a culture or a tradition to engage in jhum. While other state that they grow crops under jhum to take advantages of the pattern mixed cropping as it provide foods for the subsistence of the household.

Therefore, from the jhumias perception it reveals that crops under traditional method like Jhum is practice because mostly of them depend for livelihood.

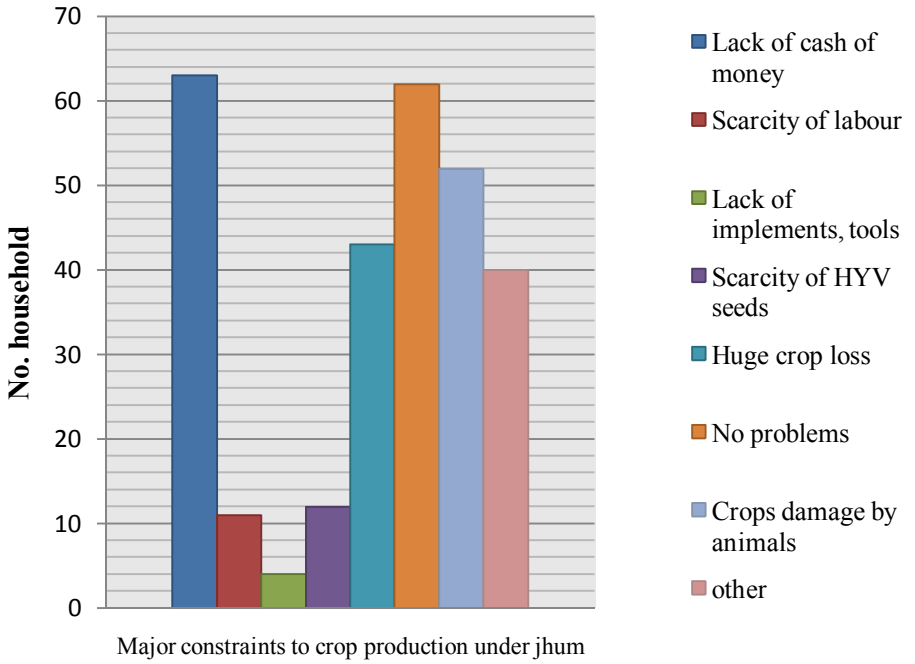


4.3.2 *What are the major constraints (risks) to crop production under Jhum?*

The study on the major constraints under jhum reveals that 22.0 per cent of the jhumias faced shortage of money, while 21.6 per cent have face no problems or such, 18.1 per cent faced crops damaged by wild animals, 15 per cent faced huge loss of crops, 13.9 faced others, in which 4.2 per cent percept to be due to scarcity of HYV seeds, insecticides etc., 3.8 per cent was due to scarcity of labour, 1.4 per cent was due to lacks of implements, tools etc.

The others here also covers the problems like the bad road condition where for some it took 2-3 hours to reach their jhum land. They also mention the damaged cause by natural disaster like earthquake and cyclone. When those who grow crop under jhum especially rice is few in one village it becomes affected by the birds. Moreover, on estimating the output of the recent production i.e. 2013, there are 15 per cent household with zero output because of the animals and birds destruction etc.

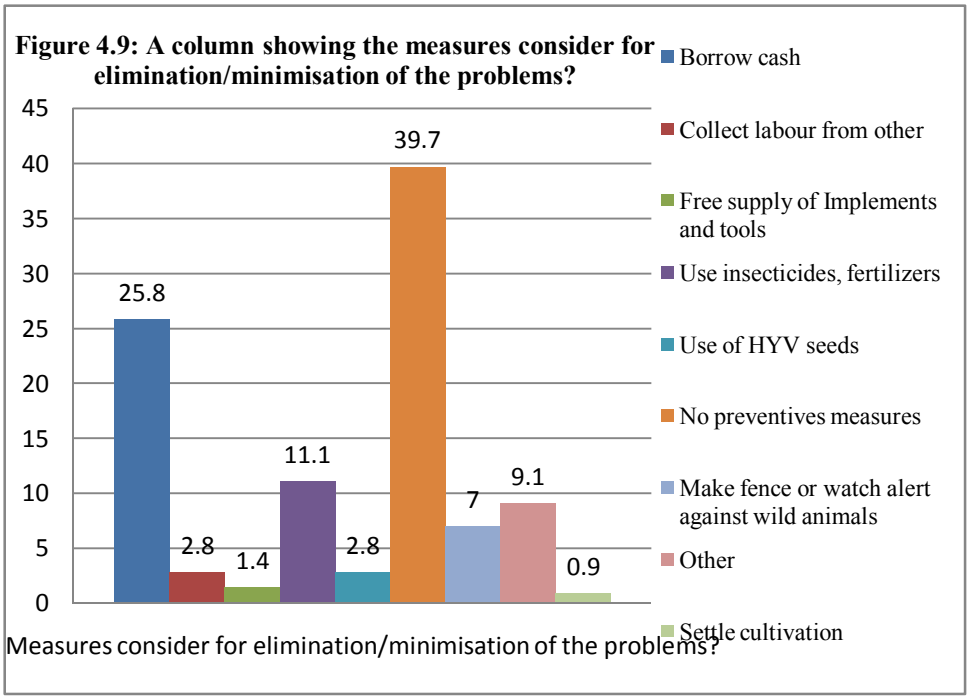
Figure 4.8: A column showing the major constraints (risks) to crop production under Jhum?



4.3.3 What measures do you consider for elimination/minimisation of the problems?

The study on the measures consider for elimination of the problems reveals that 39.7 per cent of the jhumias percept that no preventives measure can be taken for the problems under jhum. While, 25.8 per cent percept that borrow cash of money could help in such problems, 11.1 per cent percept that use of insecticides, fertilizers etc could minimize the problems, 9.1 per cent percept others steps, 7.0 per cent percept that making fence or watching/ guarding of crops against animals could minimize the problems, both 2.8 per cent percept that collecting labour from other areas and use of HYV seeds could minimize the problems, 1.4 per cent percept that if implements and tools are supply from the government it would minimize the

problems, while 0.9 per cent percept practice of settle cultivation would minimize the problems under jhum.



4.3.4 Crops damaged by wild animals

The tables shows that the crops of the Jhumias was mostly damaged by wild boar in which the report state 48.94 per cent, 29.79 per cent report crops damaged by birds, 10.64 per cent by rats, 4.25per cent both by porcupine and bear and 2.13 per cent by horse.

Table-4.18: Crops damaged by wild animals

Sl.no	Crops damaged by wild animals	Per cent
1	Birds(Sava, pitte)	29.79
2	Rats (Sazu)	10.64
3	Wild Boar(Sanghal)	48.94
4	Porcupine (Sakuh)	4.25
5	Bear (Savawm)	4.25
6	Horse (Sakawr)	2.13
	Total	100

Source: Based on Field Survey (20013-2014)

4.3.4 General Perception:

It is found that 71.8 per cent of the jhumias report that their present income is sufficient for their family, while the other 28.2 per cent report that their present income is not sufficient. To maintain such shortage 14.3 per cent go for wage or labour, 10.1 per cent borrow, 3 per cent goes for others like selling domestic property etc and 2.8 per cent go for selling crops etc.

The study on whether they are practicing jhum in 2014 results that 73.9 per cent of the jhumias respondent are willing to grow crops under jhum while 26.1 per cent are not willing to practice crops under jhum.

4.3.5 Work Partnership

A system of exchange labour or work partnership known as Inlawm is incorporated in the work culture of jhum. This is very helpful to give boost to the spirit and lighten the burden of work[27]. Table-4.19 shows that 35.5 per cent of the jhumias still practice work partnership while 64.5 per cent of the jhumias did not practice work partnership in jhuming.

[27] Thangchungnunga (1994). The problem of land utilization and the place of land resources in the economic life of the Mizo society, Ph.D Thesis, Gauhati Univ., Guwahati.

Table-4.19: Agricultural work partnership

	No. of Household	Per cent
YES	102	35.5
NO	185	64.5
Total	287	100.0

Source: Based on Field Survey (20013-2014)

4.4 CONCLUSION

In the above studies simple averages, classification and tabulation is used for the analysis of the data. It helps us in understanding the complex relation of the socio-culture and socio-economic life of the Jhumias to Jhum. The perception of the Jhumias in jhum cultivation or 'Lo' clearly highlights the knowledge of the Jhumias in their agriculture practice. This chapter reveals the social economic condition of the Jhumias.

References

Jha, L. K (1997). *Shifting Cultivation.* New Delhi: APH Publishing.pp 39.

Thangchungnunga (1994). The problem of land utilization and the place of land resources in the economic life of the Mizo society, Ph.D Thesis, Gauhati Univ., Guwahati.

Yadav PK (2013). Slash-and-Burn Agriculture in North-East India. ExpertOpinEnviron Biol 2:1

Web References

Wikipedia, the free encyclopedia http://en.wikipedia.org/wiki/Mizoram (Retrieved on dt 22.6.2013)

CHAPTER 5

NATURE AND EMPLOYMENT AND PRODUCTIVITY UNDER SHIFTING CULTIVATION

CHAPTER 5: NATURE AND EMPLOYMENT AND PRODUCTIVITY UNDER SHIFTING CULTIVATION

5.1 INTRODUCTION

Like many other productive activities, maximisation of output is the chief aim of agriculture. But the levels of output are always different at different places because the level of output depends largely on the relative factor endowments of different areas. In developing countries, the main factor inputs of agriculture are land and labour; and the productivity of agriculture is highly dependent upon the quantity and quality of these factor inputs. Besides, the right combination of these two inputs is of vital importance to promote the efficiency of the forms.

Farm size is a topic of extreme interest; and there has been heated debate as to the appropriate size of the farm. There are economists and farmers who advocate large scale farming for efficient operations of the farms. At the same time there are some economists who advocate small scale farming especially in developing countries.

Advocates of large sized farms argue that large sized farming is more economical and conductive to greater efficiency than the small sized farms. One of their arguments is that all the technological advantages opened to small and marginal farms are also opened to large farms while all advantages opened to large farms are not opened to small and marginal farms. They also argue that production economics will be reaped by large farms on account of use of up-to-date and most automatic

machines, division of labour and specialization, better utilisation of by-products, benefits of research etc. A large farm is also supposed to be able to use a higher proportion of capital and land for direct productive use with a consequent reduction in overhead costs per unit of production.

In modern world, market economics arise from facilities to buying and selling on a large scale. In a market where buying and selling of agricultural inputs is done, large farms are usually given preferential treatment in prices, in discount and rebates because the sellers spent less amount in transport, handling, packing etc.

Another advantage of large farm are the availability to obtain credit with greater ease at less expenses and in the opportunity to reduce labour costs. This is because large farms can put each worker to the task to which he is most suited and take the maximum advantage of both natural aptitudes and that of acquired skill and speed.

However, if the size is extended beyond a limit, some of the economies attributed to large size farms may tend to be offset by inefficiencies. Further, in most cases, small farming is more intensive than large farming with the resultant effect of higher gross production per acre of land.

From the social point of view large sized farms may not be desirable because they may lead to concentration of economic power which is anti-social. But too small a size as it exists in most of the developing countries has exhibited serious disadvantages.

From the above statements it is clear that size of holding has an important effect on the level of output. At the same time, land alone is not the factor-input which settled the level of output. In developing countries, where agriculture is not

mechanised, labour is a very important factor-input. Hence land-labour ratio plays an important role in agriculture. As such the right combination of land and labour is of vital importance.

The right combination of land and labour is even more important under shifting cultivation. Yield per cultivated land also depends upon the fertility of the soil, climatic conditions, technology etc. Larger size of holding is assumed to make larger output and to have the capacity to absorb more labour than that of the small and marginal farming. The small and marginal farmers not only have lower employment potential but are generally unable to absorb even the family labour. This has always resulted in the predominance of disguised and under-employment problems especially in rural areas of developing countries.

The general economic condition of the farm household is largely dependent upon the holding size; and larger holdings are assumed to mean greater prosperity of the farm household and vice-versa. Besides large farms are economically and technologically more viable than the small and marginal farms. Now a day, technological improvement has resulted in a rapid increase in the agricultural productivity. In developed countries a small percentage of workers can produce a large quantity required by industrial workers. However, in developing countries with high density of population the degree of mechanisation should be carefully considered.

In traditional agriculture like shifting cultivation which is mostly practised in Mizoram, the employment of modern technology is limited by the method itself. In any case, the level of output is supposed to be related to the size of holding and the level of employment.

5.2 NATURE AND EMPLOYMENT UNDER SHIFTING CULTIVATION

5.2.1 EMPLOYMENT AND OUTPUT

In every line of production, labour is an indispensable input. In agriculture, the importance of labour as an input cannot be overemphasized because agricultural productivity is largely dependent on labour services. Hence, more labour means more production and vice versa. Besides this, the quantum of labour employed in the production process furnishes income which plays an important role as a means of livelihood for those who get employment. In fact, the wages of labour happen to be the only source of income to most of the workers who do not have any other factors such as land and/or capital. However, labour absorption capacity depends largely on the nature of technology employed in the production process. As such, the labour absorption capacity differs from sector to sector and from farm to farm even within the same sector.

Thus, the level of employment is likely to have some effects in the production and productivity of a farm. Thus, the correlation or association between the two variables-employment and output may be expected to be high. The nature and extent of interrelation between employment of labour and output is evaluated by means of regression-correlation coefficient. The table value of the coefficient of correlation between these two variables is -0.32 which is very much surprising that excess an inverse relationship between the two variables as against our hypothesis that will be positively related. The correlation coefficient is statistically significant correspond to t value being -2.85. The numeral of which is more than the table value on the negative side. However, this interrelation is very low that only 10.04 per cent of the

total variation of output is explained by labour employment and 89.46 per cent of the overall variation in output is explained by factors other than employment of labour. This is also confirmed by the regression equation given below:

$$\text{Log } Y = 0.32 + 2.04 \text{ Log } E \qquad R^2 = (0.1024)$$

$$(-2.85) \qquad F = (0.9126)$$

Where Y represents output and E refers to employment of labour.

The estimated parameters have supported the interrelation between the two variables worked out by means of correlation coefficient correspond to an unit increase in the employment of labour, the output level under shifting cultivation decreases by 2.04 quintals.

Thus, this equation has shown that shifting cultivation has been in operation beyond the national stage of production. It has also shown that there has been a predominance of disguised unemployment in the process of shifting cultivation.

5.2.2 PATTERN OF HUMAN LABOUR USE FOR PRODUCING CROPS UNDER JHUM

Mandays devoted in Jhum per household:

The mandays devoted in Jhum consist of the pattern of human labour between household and hired labour both male and female on the different work category

i.e. cleaning and burning, sowing and transplanting, weeding, crop protection and harvesting.

Table-5.1: Average Number of Mandays devoted to Jhum Cultivation per Households

Labour	Male	Female	Total
In man days			
Households Labour	105	81	186
Hired Labour	60	58	118
Total Labour	165	139	304
in per cent			
Households Labour	63.64	58.27	61.18
Hired Labour	36.36	41.73	38.82
Total Labour	100	100	100

Source: Based on Field Survey (2013-2014)

The study on the average number of mandays devoted in jhum cultivation per household (in man days) shows that 186 people of the labours are household labour, where 105 person are household male labour and 81 person are household female labour. Meanwhile, 118 persons of the labours are hired labour, in which 60 are hired male labour and 58 people are hired female labour.

The study on the average number of mandays devoted in jhum cultivation per household (in per cent) shows that 61.18 per cent of the labours are household labour, where 63.64 per cent are household male labour and 58.27 per cent are household female labour. Meanwhile, 38.82 per cent of the labours are hired labour, in which 36.36 per cent are hired male labour and 41.73 per cent are hired female labour.

Figure 5.1: Average Number of Mandays devoted in Jhum Cultivation (in man days)

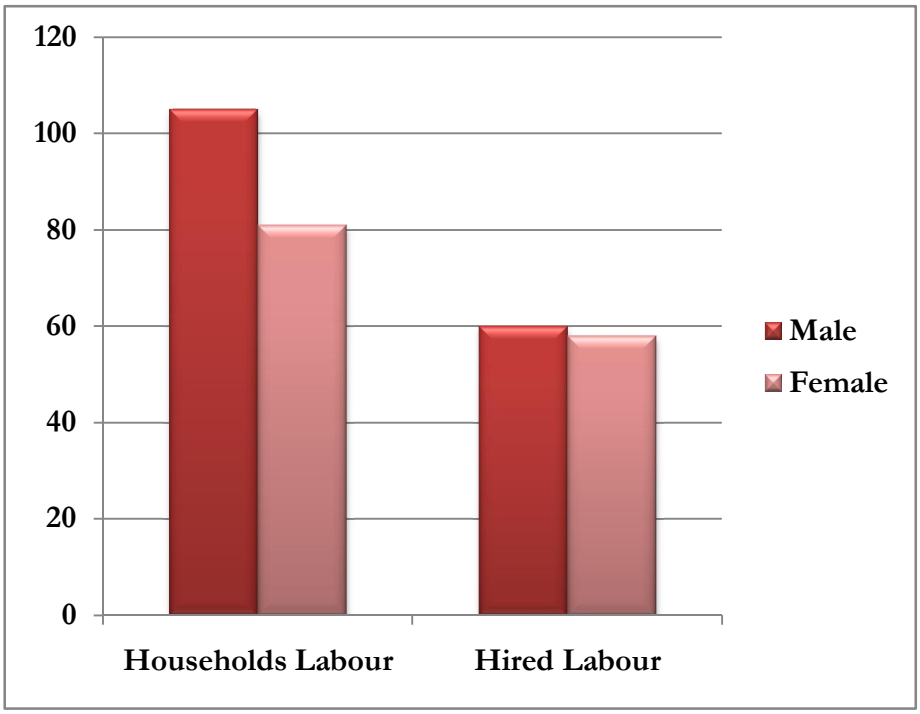
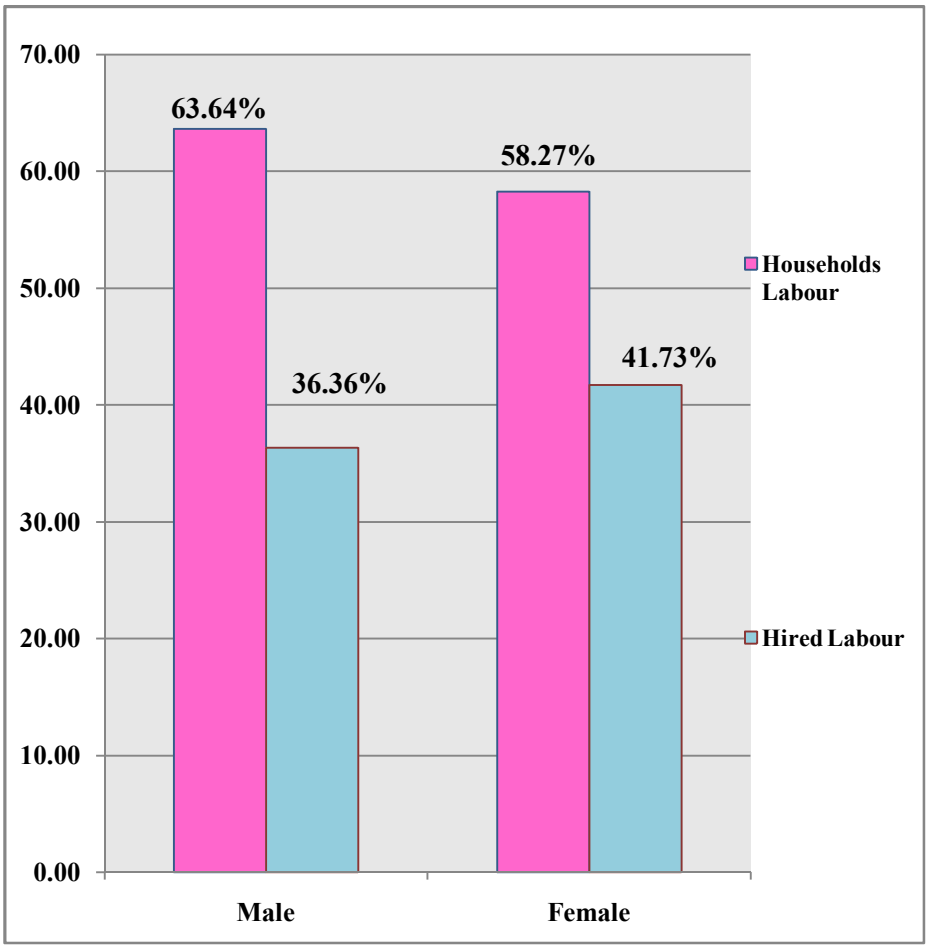


Figure 5.2: Average Number of Mandays devoted in Jhum Cultivation (in per cent)



Mandays devoted in Jhum Cultivation by sex

The mandays devoted in Jhum of the pattern of human labour between household and hired labour both male and female on the different work category is studied on the basis of sex.

Table -5.2 Average numbers of mandays devoted in Jhum by sex

Mandays

Nature of Works	Household			Hired		
	Male	Female	Total	Male	Female	Total
Cleaning & burning	16	5	21	13	0	13
Sowing & transplanting	8	7	15	7	7	14
Weeding	51	43	94	30	41	71
Crop Protection	13	10	23	1	0	1
Harvesting	18	16	34	9	11	20
Total	21	16	37	12	12	24

Source: **Based on Field Survey (20013-2014)**

The study on the average number of mandays devoted in jhum (in man days) shows that in Cleaning and burning 34 labour are engage both from household and hired labour, where 21 labour engage from household, in which 16 labour are household male and 5 labour are household female. Meanwhile 13 labour engage from hired, where cent per cent are hired male labour. This work category is mainly done by male.

In sowing and transplanting, 29 labours are engage both from household and hired labour, where 8 labours engage from household, in which 8 labours are household male and 7 labours are household female. Meanwhile 14 labours engage from hired, in which 7 labour are hired male and 7 labours are hired female.

In weeding, 165 labours are engage both from household and hired labour, where 94 labours engage from household, in which 51 labours are household male and 43 labours are household female. Meanwhile 71 labours engage from hired, in which 30 labour are hired male and 41 labours are hired female.

In crop protection, 24 labours are engage both from household and hired labour, where 23 labours engage from household, in which 13 labours are household male and 10 labours are household female. Meanwhile 1 labour engage from hired, where cent per cent are hired male labour. This work category is mainly done by the household where they stay in the hut watching and guarding the crop day and night until the time of harvesting.

In harvesting, 54 labours are engage both from household and hired labour, where 34 labours engage from household, in which 18 labours are household male and 16 labours are household female. Meanwhile 20 labours engage from hired, in which 9 labour are hired male and 11 labours are hired female.

As a whole, the total average number of household labour devoted to the different work category is 187, i.e. 106 are household male labour and 81 are household female labour. Meanwhile, the average number of hired labour devoted to the different work category is 119, i.e. 60 are hired male labour and 58 are hired female labour.

Overall, the average number of household labour devoted to the different work category is 37, i.e. 21 for household male labour and 16 for household female labour. Meanwhile, the average number of hired labour devoted to the different work category is 24, i.e. 12 for hired male labour and also 12 for hired female labour.

Table-5.3: Average Number of mandays devoted in Jhum field by Sex

Per cent

Nature of Works	Household			Hired		
	Male	Female	Total	Male	Female	Total
Cleaning & burning	77.28	22.72	100	96.60	3.40	100
Sowing & transplanting	53.41	46.59	100	52.38	47.62	100
Weeding	54.10	45.90	100	42.68	57.32	100
Crop Protection	55.92	44.08	100	100.00	0.00	100
Harvesting	52.69	47.31	100	47.15	52.85	100
Total	56.63	43.37	100	50.87	49.13	100

Source: Based on Field Survey (20013-2014)

The study on the average number of mandays devoted in jhum (in per cent) shows that in Cleaning and burning 77.28 per cent of labour engage from household male and 22.72 per cent of labour engage from household female. Meanwhile 96.60 per cent of labour engage from hired male and 3.40 per cent of labour engage from hired female.

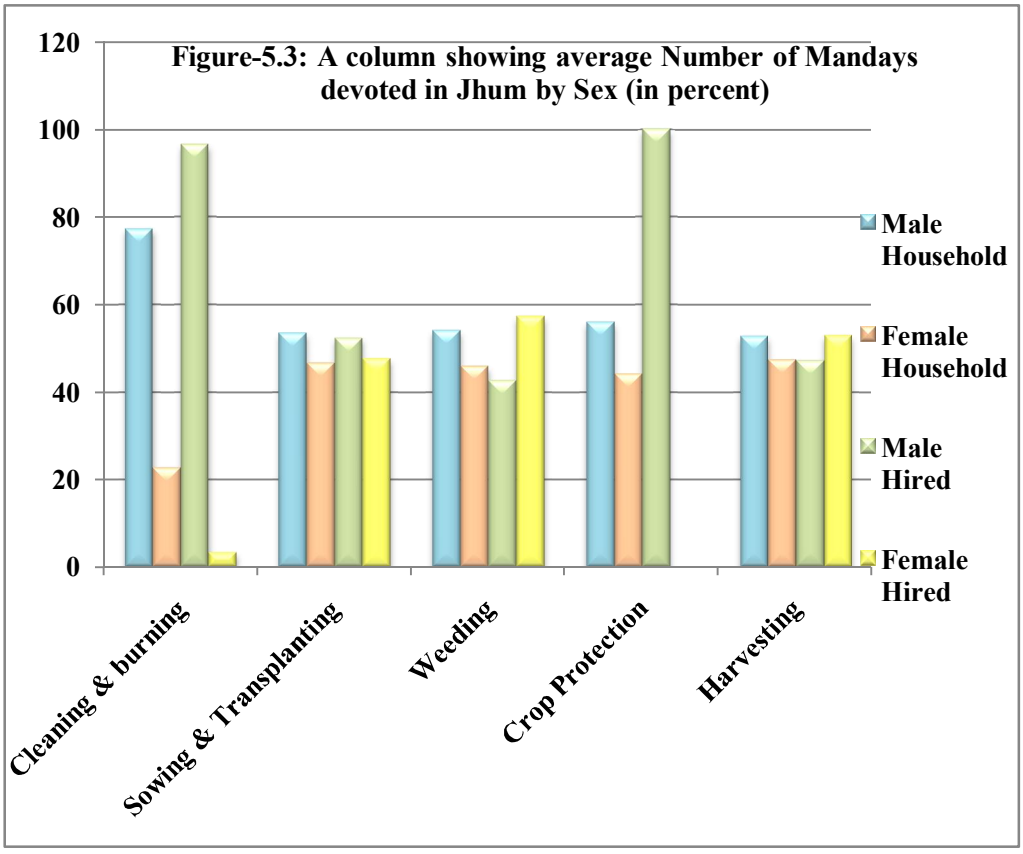
In sowing and transplanting, 53.41 per cent of labour engages from household male and 46.59 per cent of labour engages from household female. Meanwhile 52.38 per cent of labour engages from hired male and 47.62 per cent of labour engages from hired female.

In weeding, 54.10 per cent of labour engages from household male and 45.90 per cent of labour engages from household female. Meanwhile 42.68 per cent of labour engages from hired male and 57.32 per cent of labour engages from hired female.

In crop protection, 55.92 per cent of labour engages from household male and 44.08 per cent of labour engages from household female. Meanwhile 100 per cent of labour engages from hired male.

In harvesting, 52.69 per cent of labour engages from household male and 47.31 per cent of labour engages from household female. Meanwhile 47.15 per cent of labour engages from hired male and 52.85 per cent of labour engages from hired female.

The overall average number of household labour devoted to the different work category shows that 56.63 per cent of labour engages from household male labour and 43.37 per cent of labour engages from household female. Meanwhile, the overall average number of hired labour devoted to the different work category shows that 47.15 per cent of labour engages from hired male labour and 52.85 per cent of labour engages from hired female.



Distribution of man days over different work category

The distribution of mandays over different work category shows the average number of person per household in mandays and per cent. It can be seen from Table 233 that 61.16 per cent of labour are household labour and 38.84 per cent are hired labour in cleaning and burning. In sowing and transplanting, 51.75 per cent of labours are household labour and 48.25 per cent are hired labour. In weeding, 57.16 per cent of labours are household labour and 42.84 per cent are hired labour. In crop protection, 97.57 per cent of labour is household labour and 2.43 per cent are hired labour. In harvesting, 63.22 per cent of labours are household labour and 36.75 per cent are hired labour.

Table-5.4: Distribution of mandays over different work category

Categories of Work	Average No. per Households (in Mandays)			Average No. per Households (in %)		
	Households	Hired	Total	Households	Hired	Total
Cleaning & burning	21	13	34	61.16	38.84	100
Sowing & transplanting	15	14	28	51.75	48.25	100
Weeding	94	70	164	57.16	42.84	100
Crop Protection	23	1	23	97.57	2.43	100
Harvesting	34	20	54	63.22	36.78	100
Total	186	118	303	61.25	38.75	100

Source: Based on Field Survey (20013-2014)

Distribution of mandays under jhum by nature of works

The distribution of mandays under jhum by nature of works shows the average number of person per household in mandays and per cent. It can be seen from Table 233 that 11.14 per cent of labour are household labour and 11.15 per cent are hired labour in cleaning and burning. In sowing and transplanting, 7.90 per cent

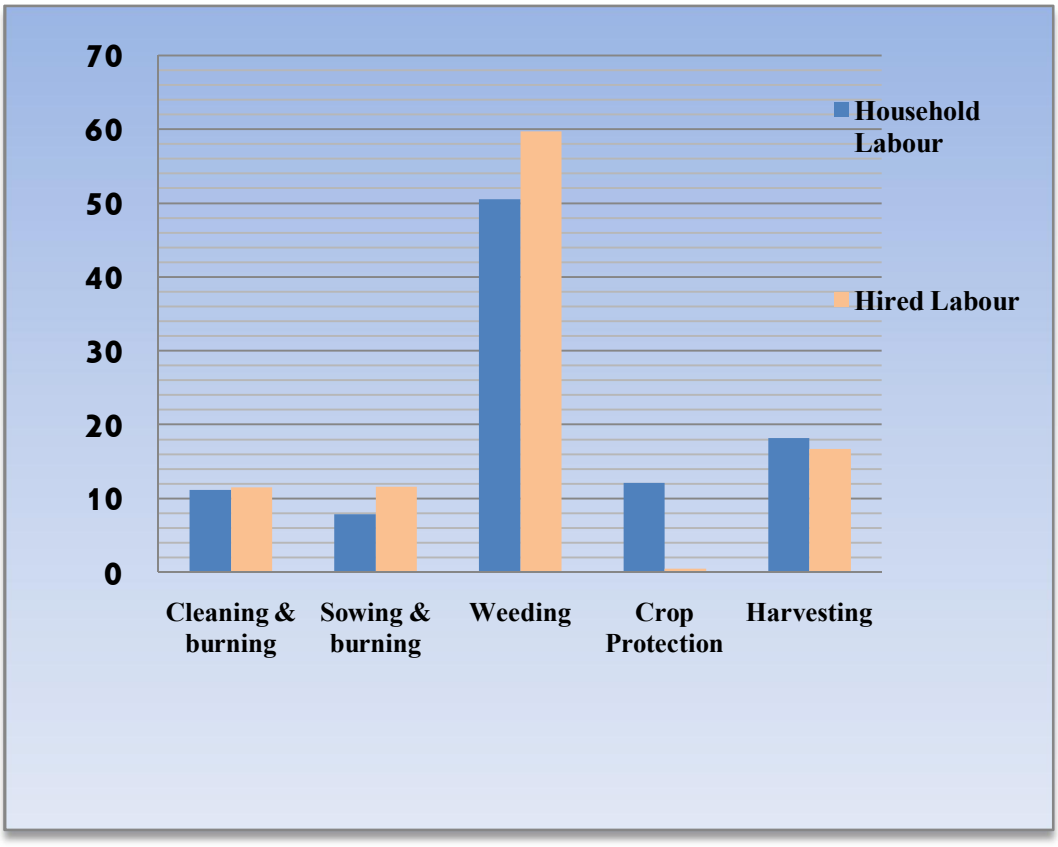
of labours are household labour and 11.61 per cent are hired labour. In weeding, 50.52 per cent of labours are household labour and 59.69 per cent are hired labour. In crop protection, 12.12 per cent of labour is household labour and 0.48 per cent is hired labour. In harvesting, 18.19 per cent of labours are household labour and 16.68 per cent are hired labour.

Table-5.5: Distribution of Mandays under Jhum Cultivation by Nature of Works

Categories of Work	Average No. per Households (in Mandays)			Average No. per Households (in %)		
	Households	Hired	Total	Households	Hired	Total
Cleaning & burning	21	13	34	11.14	11.15	11.18
Sowing & transplanting	15	14	28	7.90	11.61	9.37
Weeding	94	70	164	50.52	59.69	54.25
Crop Protection	23	1	23	12.12	0.48	7.63
Harvesting	34	20	54	18.19	16.68	17.66
Total	186	118	303	100	100	100

Source: Based on Field Survey (20013-2014)

Figure -5.4: Distribution of Mandays under Jhum Cultivation by Nature of Works)



For producing crops under jhum the requirement of labour is high at 'Weeding' of the work category which is shown in column in Fig-5.3. Moreover, the weeding is carried several times at least thrice to four during the month of June, July, august and till September.

Daily wage of the jhum labour

Table-5.4: Average Daily Wage Rate for Hired Labour in Jhum Cultivation 2009-2013

Particulars	No. of cases	Mean	Std. Deviation
Male Wage Rate (Rs/day)	284	102	119.91
Female Wage Rate (Rs/day)	284	86	102.30

Source: Based on Field Survey (20013-2014)

The daily wage rate differ from village to village, in the circle of the study area where farm labour are scarce the daily wage rate becomes high, but at the same time only household labour engage in the work as labour are scarce and their daily wage is high. As such through jhum cultivation it becomes difficult to pay the labour daily wage with its subsistence output. The daily wage rate for male labour is between 200-300 Rupees and for female 150-250 Rupees in the study area (2013).

Table-5.4 shows the average daily wage rate for hired labour of 2009-2013 because in the study the annual yearly output and area of holdings is taken into account/consideration from 2009-2013. The male average daily wage rate for male labour is Rs 102 and Rs 86 for female labour.

5.3 PRODUCTIVITY UNDER SHIFTING CULTIVATION

5.3.1 SIZE OF HOLDING AND OUTPUT

Generally, output depends on the quantity of factor inputs, their quality and the technology employed in the production process. In agriculture, the quantity and the quality of land is the single most important factor input. In fact, the availability of other inputs like labour, the nature and level of technology, water, fertilizers, seeds, etc are highly dependent on holding size. Larger farms have greater employment potentials than small and marginal farmers, and offer greater scope for high level technology. A farm which has greater employment potential and is economically and technologically viable has greater output potential. As such, a large farm is supposed to produce more output than the small and marginal farms.

On the basis of the above assumptions, the correlation or association between the holding size and output levels are expected to be high. As such, the hypothesis is directly tested by means of regression- correlation analysis worked out for jhum cultivation. The coefficient of correlation between these two variables- size of holding and output is 0.32. The coefficient of correlation is statistically significant correspond to t value being 2.85 which is more than the table value. However, only 10.24 per cent of the total variation in the output of shifting cultivation is explained by the changes in the holding size. Hence, 89.76 per cent of the overall variation in output is explained by factors other than holding size. Therefore, these other factors exercise much greater degree of influence on output. This is also evident from the estimated regression equation given below.

$$\text{Log } Y = 197.9 + 0.58 \text{ Log } L \qquad R^2 = (0.1024)$$

$$(2.85) \qquad F = (0.9127)$$

where Y refers to output and L stands for holding size.

The estimated parameter have the expected value and is significant correspond to a unit (acre) increase in the holding size the level of output increases by .88 quintals. So this equation gives empirical support to our hypotheses that the size of output depends upon the size of holding. The elasticity coefficients have the expected sign and are also statistically significant. However, the elasticity coefficient, which is 0.58, indicates that production is taking place under diminishing returns to this factor input (land).

5.3.2 PRODUCTION UNDER JHUM CULTIVATION

Production of Rice

In Mizoram only 20 per cent of the demand for rice could be met within the State. During 2009-10, a total of 1,42,8600 tonnes of rice was lifted by the State Government from outside[28]. Moreover rice is the main crop grown in the state or the principal food crop and the staple food of the Mizo. The total population of Mizoram is 10, 91,014 as per 2011 census with the total decadal growth rate of 22.78 %. In

[28] Economic Survey Mizoram 2011-2012 pp-i

spite of the growing Rice requirement of the state which is estimated to be around 2, 00,000MT per year, Rice production of the state is still meagre.

The State is deficient in food grain production, the production of rice is 52, 000 MT against the requirement of 1, 80,000 MT a year which could meet only 28.80 per cent of the requirement[29].

The average size of holdings is calculated by means of mean and it is found that the size of holding per household has increased from 0.06 acre in 2009 to 1.48 acres in 2013. At the same time, the productivity of land per acre has been diminishing i.e. 33.59 quintal in 2009, 15.27 quintal in 2010, 10.77 quintal in 2011, 7.11 quintal in 2012 and 4.62 quintal in 2013.

Table- 5.7: Areas of Production of Paddy under Jhum Cultivation

Year	Area (Hectare)		Production (Kg)		Productivity (Kg/ha)
	Average	SD	Average	SD	
2009	0.06	0.50	26.59	210.66	3358.79
2010	0.38	1.08	183.97	577.40	1527.32
2011	0.55	1.33	226.83	587.15	1076.75
2012	0.92	1.64	312.64	656.37	710.86
2013	1.48	1.67	427.08	684.46	462.21

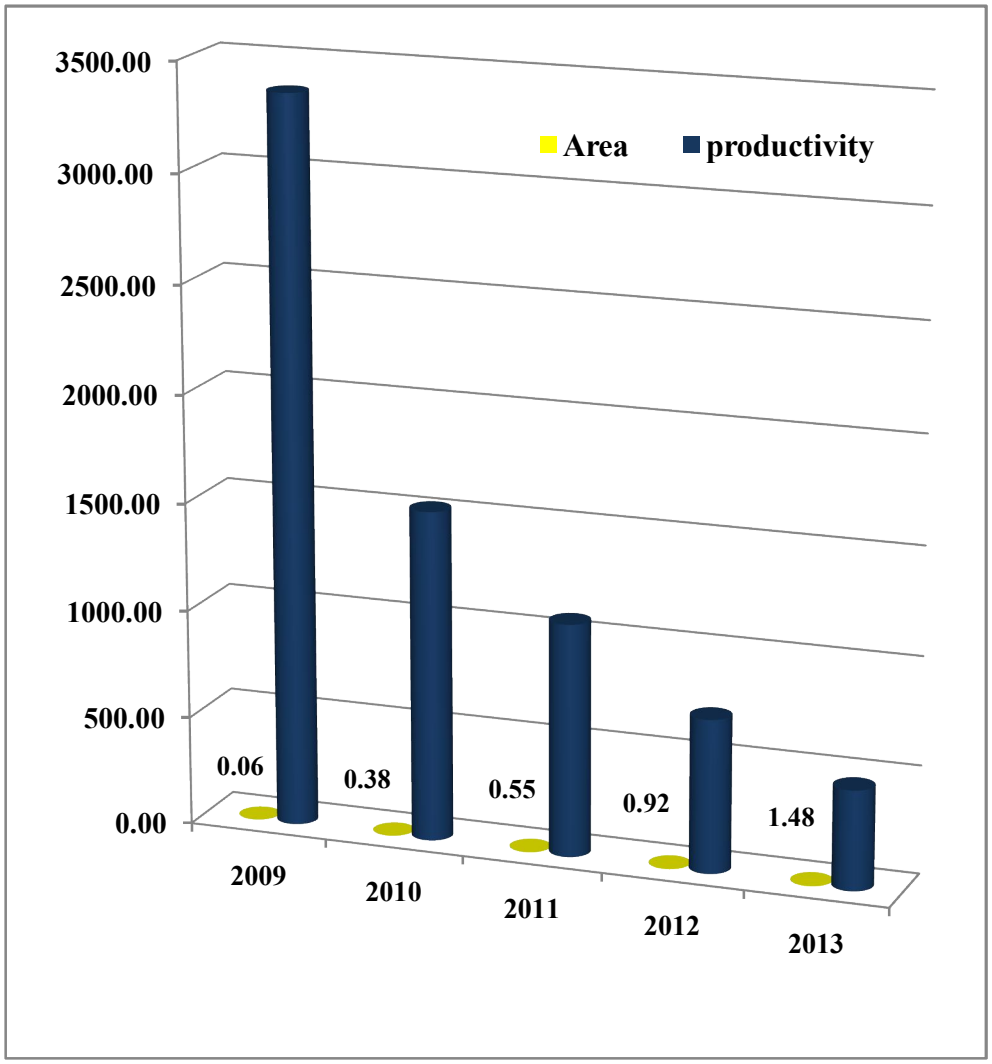
Source: Based on Field Survey (20013-2014)

The average production and productivity per acre diminishes with size which shows that this form of cultivation is form inefficient. Therefore, Fig-5.5 shows that the productivity in kg/ha keep decreasing even when the land area increases. The lower productivity of paddy under jhum is due to non adoption of improved-

[29] Economic Survey Mizoram 2011-2012 pp-29

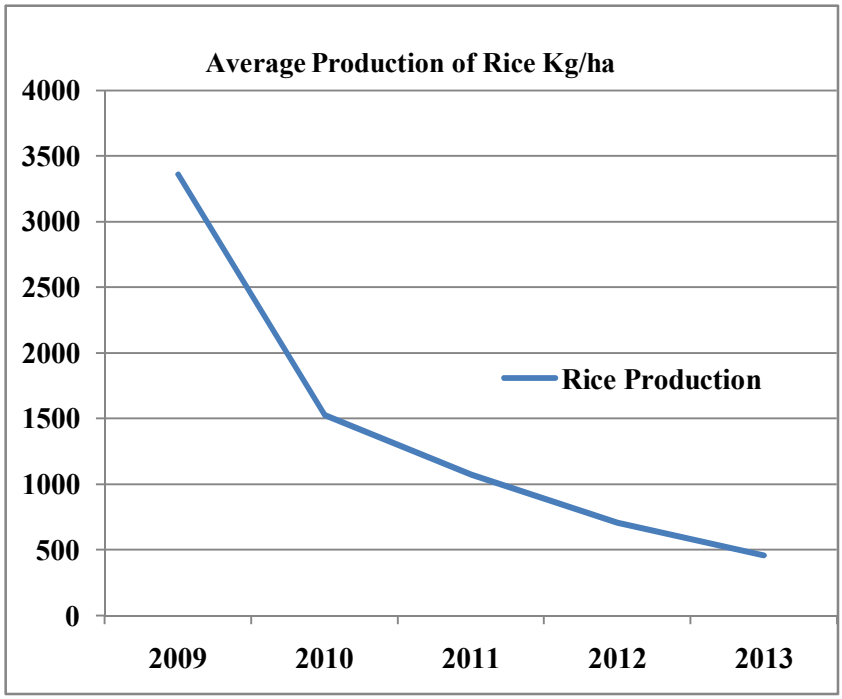
agronomic practices as efficient rain water management, no intercultural operation as weeding, improper sowing, and no taking up sound plant protection measures[30].

Figure-5.5: A column showing areas of Production of Paddy under Jhum Cultivation



[30] Rathore, S. S. Paradigm Shift for Enhancing Rice Productivity in Nagaland: Existing Practices and their Refinement. *World*, *151*(592.83), 39-12.

Figure-5.5: A graph showing average Production of Paddy under Jhum Cultivation



Consumption Requirement of Rice

The study on the average annual household consumption requirements of rice with special reference to the year 2013 shows that 2400 kg at maximum, 873 mean and 415 of standard deviation.

Table-5.8: Average Annual Household Consumption Requirements of Rice (Ref. 2013)

Sl. No	Cases	Quantity (kg)
1	No. of Households	287
2	Maximum	2400
3	Mean	872.92
4	Std. Deviation	415.55

Source: Based on Field Survey (20013-2014)

Crops cultivated and sold

In the study area Chillies and tobacco are the main crops that are cultivated and sold where other crops are cultivated and consume i.e. for the subsistence of the jhumias. Out of the total sample survey only one household report that they did not sold crops cultivated under jhum during 2012-2013.

Table- 5.9: Values of Other Crops Cultivated and Sold Under Jhumming during 2012-2013

Sl. No	Cases	Average (Rs)
1	No. of Households Reported	286
2	Maximum	350000
3	Mean	10554.90
4	Std. Deviation	31643.68

Source: Based on Field Survey (20013-2014)

5.4 CONCLUSION

The overall conclusion that may be drawn from the above empirical findings is that shifting cultivation has been in operation under diminishing returns to the basic factors inputs- land and labour. Besides this, there has been a predominance of disguised unemployment under employment of labour in the production process of shifting cultivation. This evidence has shown that shifting cultivation is not a viable method of cultivation; and it is a high time to find an alternative method of cultivation and to create other employment opportunities to reduce too much population pressure on land and to do away with disguised unemployment which has been prevalent among the workers under shifting cultivation.

References

Government of Mizoram (2013). Economic Survey Mizoram 2012-2013, Planning & Programme Implementation Department.pp-i.

Government of Mizoram (2012). Economic Survey Mizoram 2011-2012, Planning & Programme Implementation Department.pp-29.

Rathore, S. S. Paradigm Shift for Enhancing Rice Productivity in Nagaland: Existing Practices and their Refinement. World, 151(592.83), 39-12.

CHAPTER 6

MAIN FINDINGS, SUGGESTION AND CONCLUSIONS

CHAPTER 6: FINDINGS, CONCLUSION AND SUGGESTIONS.

6.1 MAIN FINFINGS OF THE STUDY

Employment and output

- The nature and extent of interrelation between employment of labour and output is very low that only 10.04 per cent of the total variation of output is explained by labour employment and 89.46 per cent of the overall variation in output is explained by factors other than employment of labour.
- The estimated parameters have supported the interrelation between the two variables worked out by means of correlation coefficient correspond to an unit increase in the employment of labour, the output level under shifting cultivation decreases by 2.04 quintals.
- The estimated equation has reveals that shifting cultivation has been in operation beyond the national stage of production. It has also shown that there has been a predominance of disguised unemployment in the process of shifting cultivation.

Size of holding and output

- The elasticity coefficients which are 0.58 have the expected sign and are also statistically significant. However, the elasticity coefficient indicates that production is taking place under diminishing returns to this factor input (land).

Socio-economic Condition of the Jhumias

- The study reveals that 40.42 per cent of the jhumias belong to Above Poverty Line (APL). While 34.15 per cent belong to Below Poverty Line (BPL) and the other 25.44 per cent belong to Antyodaya Anna Yojana **(**AAY).
- The study shows that 94.77 per cent of the jhumias are Christian, while the other 5.23 per cent are Buddhist.
- The study of the age distribution of members of the jhumias families shows that 27.56 per cent are between 18-35 age group, 21.95 per cent are between 35-60 age group, 20.19 per cent are between 6-14 age group, 13.09 per cent are below 6 years. 10.07 per cent are between 14-18 age group and 7.15 per cent are above 60 years.
- The study of the educational levels/attainments of the members of the Jhumias families in the study area shows that 29.21 per cent studied till 1-4 standard, 20.19 per cent studied till 5-8 standard, 16.84 per cent are illiterate, 15.18 per cent studied 9-10 standard, 13.26 per cent are infant or not yet attain school, 3.41 per cent studied higher secondary school, graduation are 2.59 per cent and 0.33 per cent are Post graduate.
- The study of the main activities of the family members in the study area shows that 33.39 per cent are student, 32.34 per cent are engaged in agriculture, 13.48 per cent are not applicable like infant etc, 5.123 per cent are housekeeper, 3.69 per cent are government servants, 3.19 per cent are unemployed, 2.26 per cent are non-farm labours, 1.87 per cent are retired, 1.76 per cent are engage in business men or women, 1.38 per cent are engage in farm labour, 1.38 per cent are engage in other profession and 0.17 per cent are engage in Religious work.

- The study shows that 19.2 per cent of the jhumias have an annual income below 25,000, 27.2 per cent have an annual income between 25,000 - 50,000, 26.1 per cent have an annual income between 50,000-75,000, 7.3 per cent have an annual income between 75,000 – 1 Lakhs, 20.2 per cent have an annual income above 1 Lakhs.
- The study shows that the 65.5 per cent of the ethnic groups of the jhumias belong to Lai, 10.5 per cent are BRU/ Bawm, 8.4 per cent are Chakma, 6.2 per cent are Mara, 5.2 per cent are Lusei, 2.1 per cent are Matupi/Zotung, and 0.7 per cent belongs to Hmar.
- The study of the categorical distribution of the jhumias family members in the study area shows that 57.10 per cent of the total household are adult members and 42.57 per cent are minor members. Therefore, 43.83 per cent of the population are workers. The average family size constitutes 6.4 persons per family.
- The study reveals that 60.6 per cent of the Jhumias are beneficiaries of NLUP, and where 39.4 per cent are not beneficiaries of NLUP or any other Government Programme.
- The study shows that half of the Jhumias celebrate Chapchar kut, and 38.3 per cent celebrate Thlai thar kut, while 5.6 per cent of the jhumias celebrate Bizu. 1.4 per cent of the jhumias celebrate Thal favang Kut.

Productivity under Jhum

- The average size of holdings is calculated by means of mean and it is found that the size of holding per household has increased from 0.06 acre in 2009 to

1.48 acres in 2013. At the same time, the productivity of land per acre has been diminishing i.e. 33.59 quintal in 2009, 15.27 quintal in 2010, 10.77 quintal in 2011, 7.11 quintal in 2012 and 4.62 quintal in 2013.

- The results of the calculation of the coefficient of correlation between size of holding and production shows that there is a positive relationship between the size of holding and output.
- The responsiveness of output to other inputs such as land and labour (output elasticity) has been calculated by means of simple linear regression. In such a way it shows that there has been a diminishing return to both inputs (land, labour).
- The result of the calculation of the Returns to scale reveals that shifting cultivation has been operating under diminishing returns to scale.
- The study on the average annual household consumption requirements of rice of 2013 shows that 2400 kg at maximum, 873 mean and 415 of standard deviation. This shows that only 20 per cent of the demand rice could be meet from jhum or less.

Pattern of human labour use for producing crops under jhum

- The study on the average number of man days devoted in jhum cultivation of the household shows that 61.18 per cent of the labours are household labour (63.64 per cent of household labour are male and 58.27 per cent are female labour).

  Meanwhile, 38.82 per cent of the labours are hired labour (36.36 per cent of hired labour are male and 41.73 are female).

- The study on the distribution of man days over the different work categories on the average number of household shows that in cleaning and burning work category 61.16 per cent are household labour and 38.84 per cent are hired labour. In sowing and transplanting work category 51.75 per cent are household labour and 48.25 per cent are hired labours. In weeding category 57.16 per cent are household labour and 42.84 per cent are hired labour. In crop protection category, 97.87 per cent are household labour and 2.43 per cent are hired labour. Finally, in harvesting category 63.22 per cent are household labour and 36.78 per cent are hired labour. Therefore, 61.25 per cent are household labour and 38.75 per cent are hired labour on the total work category mandays.
- The study on the distribution of mandays under jhum cultivation by nature of works on the average number of household shows that 11.18 per cent of labour are engage in the cleaning and burning category. In sowing and transplanting, 9.37 per cent of labour engages in the work. In weeding, 54.25 per cent of labours are engage in the work. In crop protection, 7.63 per cent of the labour engages in the. In harvesting category, 17.66 per cent of the labour engages in the work.
- The average number of mandays devoted in jhum farming by sex shows that majority of male are engage in Cleaning & burning in both household and hired labour. In both sowing & transplanting and weeding the work engagement of male and female labours do not show much difference both in household and hired labour. But in crop protection, female labour does not engage from hired labour. In harvesting, the engagement per cent is almost the same both in household and hired labour.

- The study on the average daily wage rate for hired labour in jhum cultivation from 2009-2013 shows male wage rate at a mean of 102 and standard deviation of 119.91. While, the female wage rate shows at a mean of 86 and standard deviation of 102.30.

Perception of the Jhumias on shifting cultivation

- The study on the perception of jhumias shows that 51.6 per cent of the jhumias grow crops under traditional method like jhum for livelihood, 25.8 per cent practice jhum farming as it is an inherited practice, 8.0 per cent practice due to financial hardship, 7 per cent practice due to lack of employment, 3.5 per cent due to ignorance about other method. Meanwhile, 10.5 per cent practice for other reasons, in which 46.43 per cent are because they want to be self sufficient in foods etc. Moreover, others here also refer to different statement which is because they desire to consume rice under jhum cultivation which is more fresh and good in taste. While it is believe that if one is in a village it is a must to grow crops under jhum, as it is a culture or a tradition to engage in jhum. While other state that they grow crops under jhum to take advantages of the pattern mixed cropping as it provide foods for the subsistence of the household.

  Therefore, from the jhumias perception it reveals that crops under traditional method like Jhum is practice because mostly of them depend for livelihood.

- The study on the major constraints under jhum reveals that 22.0 per cent of the jhumias faced shortage of money, while 21.6 per cent have face no

problems or such, 18.1 per cent faced crops damaged by wild animals, 15 per cent faced huge loss of crops, 13.9 faced others, in which 4.2 per cent percept to be due to scarcity of HYV seeds, insecticides etc., 3.8 per cent was due to scarcity of labour, 1.4 per cent was due to lacks of implements, tools etc.

The others here also covers the problems like the bad road condition where for some it took 2-3 hours to reach their jhum land. They also mention the damaged cause by natural disaster like earthquake and cyclone. When those who grow crop under jhum especially rice is few in one village it becomes affected by the birds. Moreover, on estimating the output of the recent production i.e. 2013, there are 15 per cent household with zero output because of the animals and birds destruction etc.

- The study on the measures consider for elimination of the problems reveals that 39.7 per cent of the jhumias percept that no preventives measure can be taken for the problems under jhum. While, 25.8 per cent percept that borrow cash of money could help in such problems, 11.1 per cent percept that use of insecticides, fertilizers etc could minimize the problems, 9.1 per cent percept others steps, 7.0 per cent percept that making fence or watching/ guarding of crops against animals could minimize the problems, both 2.8 per cent percept that collecting labour from other areas and use of HYV seeds could minimize the problems, 1.4 per cent percept that if implements and tools are supply from the government it would minimize the problems, while 0.9 per cent percept practice of settle cultivation would minimize the problems under jhum.

- The study reveals that the crops of the Jhumias was mostly damaged by wild boar in which the report state 48.94 per cent, 29.79 per cent report crops damaged by birds, 10.64 per cent by rats, 4.25per cent both by porcupine and bear and 2.13 per cent by horse.
- Regarding the work partnership in the jhum field, it is found that 35.5 per cent of the jhumias still practice work partnership while 64.5 per cent of the jhumias did not practice work partnership in jhuming.
- It is found that 71.8 per cent of the jhumias report that their present income is sufficient for their family, while the other 28.2 per cent report that their present income is not sufficient. To maintain such shortage 14.3 per cent go for wage or labour, 10.1 per cent borrow, 3 per cent goes for others like selling domestic property etc and 2.8 per cent go for selling crops etc.
- The study on whether they are practicing jhum in 2014 results that 73.9 per cent of the jhumias respondent are willing to grow crops under jhum while 26.1 per cent are not willing to practice crops under jhum.

6.2 SUGGESTIONS

- The study clearly revealed that farmers practiced jhum cultivation for livelihood. They have continued Jhum partly due to historical reasons and partly due to poverty-related reasons such as lack of alternatives and technical know-how. Since shifting cultivation is not only an occupation but a way of life, it may be difficult to do away with it within a short span of time. Awareness campaign and training in settled cultivation and other occupation will be necessary.

- As shifting cultivation is operated under diminishing return to scale, it is clear that it is not a viable method of cultivation. As such it is a high time to change this method of cultivation, trained the jhumias to practice settled cultivation i.e. switch over to other livelihood activities like horticulture, terrace farming, Animal husbandry, contract works and wage earnings from construction works etc.

- Therefore, 39.4 per cent of the total jhumias respondents are beneficiaries are the New Land Use Policy (NLUP) which aims to gradually change the practice of jhuming with a new pattern of land use. This policy minimizes the practice of jhum cultivation. But on the same time the beneficiaries should be given training on their selected trades respectively. If not due to improper management and lack of knowledge it is no doubt that farmers will go back to practicing jhum cultivation.

- As shifting cultivation require more labour and yield very low output in return, the Government should give information to the jhumias regarding the new techniques of production and try to provide modern agricultural equipments at low prices.

- The family labour, hired labour, size of operation and size of holdings are the major determinants of output in shifting cultivation. Therefore, in some villages it becomes very difficult to get a hired labour so as for even household labour to actively work at the categorized work pattern due to other work activities like NREGS etc. As this have a huge impact on the productivity one way or another. Thus, careful management of family labour is also needed to reach targets in jhum, as when family labour is insufficient hired labour is required at peak periods.

- There is a gap in research in which it is needed to investigate land carrying capacity in the tropics, and effective use of resources etc where methods of shifting cultivation can be improved. In otherwise, the problems of shifting cultivation of its low productivity need in depth field studies to thoroughly examine and tackled at the grassroots level on the ground in searching for the best suit sound alternatives.

- Government Policies should focus on the maximum production per unit area from all categories of land on a sustainable basis, minimum environmental degradation, minimum socio-economic dislocation of the farming community, increased labour efficiency in agricultural activities to divert

rural labour into other development activities; increased capital formation from land-based activities to supplement investment requirements for other development needs; and a scientific and efficient administrative and institutional framework capable of promoting rational land use in the country.

- There is a need for approach which aims to provide enough quality food and economic security to the Jhumias. If steps are not taken then the vary likelihood of the farmers could be also in danger.

6.3 CONCLUSION

Lawngtlai District has been characterized mainly by Jhuming cultivation, unproductive methods of farming, degradation of land due to slash-and-burn practices and wasteful use of land and water. In short, it can be said that agricultural production in the state of Mizoram is very low due to improper management of land and water received. It has been blessed with the least flat land, or a mountainous topography provides ideal condition for people to grow crops under traditional practices.

Shifting cultivation is not just an occupation but also a way of life for the Mizo's. Their needs, food habits, folklores, festivals and the overall cultural ethos shows that shifting agricultural practice is deeply rooted in the social life of the farmers. Jhum does not create the required employment opportunities; moreover the estimation output of employment reveals that there has been a predominance of disguised unemployment in the process of shifting cultivation. Pressure on land has made Jhum size small and shrinkage of Jhum cycle cause low productivity resulting

in poor income for the farmers which has been operating under diminishing returns to scale.

The jhum agriculture is still continued because most of them depend on it for livelihood and partly due to the historical reasons etc. The Chakma,Bru and tuikuk ethnic group are found to be most active in jhum cultivators as they really depend for their livelihood, and it is also found that they practice shifting cultivation only for the subsistence of their life, and education attainment for their children was neglected. They live in the hut near jhum field from the time of weeding till harvest. They migrant from place to place, searching for better fertile land .It is believes that this pull down the district literacy rate

The overall conclusion that may be drawn from the above empirical findings is that shifting cultivation has been in operation under diminishing returns to the basic factors inputs- land and labour. Besides this, there has been a predominance of disguised unemployment under employment of labour in the production process of shifting cultivation. This evidence has shown that shifting cultivation is not a viable method of cultivation; and it is a high time to find an alternative method of cultivation and to create other employment opportunities to reduce too much population pressure on land and to do away with disguised unemployment which has been prevalent among the workers under shifting cultivation.

BIBLIOGRAPHY

BIBLIOGRAPHY

Aryal, K. P., Kerkhoff, E. E., Maskey, N., & Sherchan, R. (2010). Shifting Cultivation in the Sacred Himalayan Landscape: A Case Study in the Kanchenjunga Conservation Area.©. *WWF Nepal, Kathmandu*.

Amalendu Jyotish. (2004). *Ecological, Economic and Institutional Aspects of Shifting Agriculture: A study in Orissa,* PhD Thesis, Institute for Social and Economic Change, Bangalore University, Bangalore.

Biswal, D. K., & Kumar, S. (2013). Shifting Cultivation and Policies of Sustainable Development: A Meaningless Obession. *Journal of Economic & Social Development*, *9*(1).

Bhan,S.(2009). A case study on shifting cultivation practices in Mon District of Nagaland. *Journal of Soil and Water Conservation,* Vol.8, No.2, pp 8-13.

Conklin, H. C. (1957). *Hanunóo Agriculture: A Report on an Integral System of Shifting Cultivation in the Philippines* (No. 12). Food and Agriculture Organization of the United Nations.Rome.

Culas, R. J (2012): *Technological Change and Productivity Growth for Food Security: The Case of Shifting Cultivation and the REDD Policy*- Chapter 8, In: Jones, M. A and Hernandez, F. E (edited) Food Security:

Quality Management, Issues and Economic Implications, Nova Science Publishers, Inc. Hauppauge, NY,USA.

Das, Girindra Nath.(2001). *Swidden Cultivation and the Development programmes in North-East India.* New Delhi: Akansha Publishing House. pp.*4-5*

Ellen Louise McCallie (2008*). An indigenous strategy for intensifying Shifting Cultivation in Southeast Asia: A shrub-based (Tecoma Stans) managed fallow in West Timor, Indonesia.* Master of science, Thesis Cornell University, Ithaca.

FAO. (1984). *Changes in shifting cultivation in Africa*. FAO Forestry Paper 50 Rome: FAO

Fox, J., Truong, D. M., Rambo, A. T., Tuyen, N. P., & Leisz, S. (2000). *Shifting cultivation: a new old paradigm for managing tropical forests. BioScience*, *50*(6), 521-528.

Goswami, K., Choudhury, H. K., & Saikia, J. (2012). Factors influencing farmers' adoption of slash and burn agriculture in North East India. *Forest Policy and Economics*, *15*, 146-151

Government of Mizoram (2011). Agriculture Statistical Abstract 2010-2011. Directorate of agriculture (Crop Husbandry).

Government of Mizoram (2012). Agriculture Statistical Abstract 2011-2012. Directorate of agriculture (Crop Husbandry).

Government of Mizoram (2010). Statistical Handbook, Mizoram 2010, Directorate of Economics & Statistics

Government of Mizoram (2012). Statistical Handbook, Mizoram 2010, Directorate of Economics & Statistics

Government of Mizoram (2012). Economic Survey Mizoram 2012-2013, Planning & Programme Implementation Department.

Gupta, V. (2005). Jhum cultivation practices of the Bangnis (Nishis) of Arunachal Pradesh. *Indian J. Traditional Knowledge*, *4*(1), 47-56.

Jha, L. K (1997). *Shifting Cultivation.* New Delhi: APH Publishing. Pp 8-10

Lehman, F. K. (1963). *The structure of Chin society: A tribal people of Burma adapted to a non-western civilization* (No. 3). University of Illinois Press.

Laitanga, C.(1982). *Mizoram Paite Chanchin (History of Paite in Mizoram*). Aizawl, Mizoram: Tribal Research Institute.

Lalrinthanga (2001). *Comparative Economics of jhum and settled cultivation in Mizoram: with special reference to agrarian structure, employment, output and marketed surplus of foodgrains*, Ph.D., Thesis NEHU., Shillong.(Un-published).

Linkham, Anan *et.al* (2006) *Food Security of Shifting Cultivation Systems: Case Studies from Luang Prabang and Oudomxay Provinces, Lao PDR*. Journal of Mountain Science 3(1):48-57. DOI: 10.1007/s11629-006-0048-2

Mahajan, V.S., (1990).*Mizoram's jhum revisited, In: Shifting Cultivation in North-East India,* Majumder, D.N., ed., New Delhi, Omsons Publications, pp.229-36.

Mai, P. T. (1999). Socio-economic analysis of shifting cultivation versus agroforestry system in the upper stream of lower mekong watershed in Dak Lak province. *National University of Viet Nam*.

MART (April 2011). Livelihood Based Agri Business and Market Studies for North East Rural Livelihood Project. Final Report.

Miah, M. M., & Islam, S. F. (2007). *Shifting cultivation and its alternatives in Bangladesh: productivity, risk and discount rates* (No. 57).

Murtem, G., Sinha, G. N., & Dopum, J. (2008). Jhumias view on shifting cultivation in Arunachal Pradesh. *Bull Arunachal Forest Res*, *24*(1&2), 35-40.

Nang, G. K. (2011). *Zomi Christianity and cultural transformation*. Fuller Theological Seminary, School of Intercultural Studies.

Nath, T. K., Inoue, M., & Chakma, S. (2005). Shifting cultivation (jhum) in the Chittagong Hill Tracts, Bangladesh: Examining its sustainability, rural

livelihood and policy implications. *International Journal of Agricultural Sustainability*, *3*(2), 130-142.

Rathore, S. S. *Paradigm Shift for Enhancing Rice Productivity in Nagaland: Existing Practices and their Refinement.*World, 151(592.83), 39-12.

Roy Chowdhury, Indrani. (2013, 30th April). Economic Analysis of Jhum: Collective Action, Social Capital and Labour Market. *Seminar.* Lecture conducted from the Centre for International Trade & Development School of International Studies of Jawaharlal Nehru University. New Delhi, Delhi.

Sachchindananda. (1989). *Shifting Cultivation in India.* New Delhi: Concept Publishing. pp-8

Sánchez, P.A., C.A. Palm, S.A. Vosti, T.P. Tomich, and J. Kasyoki. (2005) Alternatives to slash and burn: Challenge andapproaches of an international consortium. In *Slash-and-burn agriculture: The search for alternatives*, edited by C.A. Palm,S.A. Vosti, P.A. Sanchez, and P.J. Ericksen. New York: Columbia University Press, pp 3-37.

Sahu, N C & Panda, C D, (2007, 5th January). An econometric analysis of shifting cultivation in an Indian tribal village. The 43rd Annual Conference of the Indian econometric society. IIT Bombay, Mumbai.

Sharma, D. P. (2011). Understanding the Chepangs and Shifting Cultivation: A Case Study from Rural Village of Central Nepal. *Dhaulagiri: Journal of Sociology & Anthropology*, *5*.

Shah, Md.Bahar-Ud-Din (2005). *Manipur Jhum and eco-Degradation.* Delhi B.R Publishing Corporation.

Sodarak, H. (1999). *Shifting cultivation practices by Hmong, Khamu and Lao ethnic categories in the nam Nane watershed, Nane district, Luang Prabang province, Lao PDR* (Doctoral dissertation, MS thesis, Swedish University of Agricultural Sciences, Department of Rural Development Studies, Uppsala)

Takasaki, Yoshito, (2011).*Economic models of shifting cultivation: a review.* Tsukuba Economics Working Papers 2011-006, Economics, Graduate School of Humanities and Social Sciences, University of Tsukuba.

Tawnenga. (1990).*Studies on Ecological Implication of Traditional and Innovative approaches to Shifting Cultivation in Mizoram*. PhD Thesis, North-Eastern Hill University, Shillong, India

Yadav PK (2013). Slash-and-Burn Agriculture in North-East India. Expert Opin Environ Biol 2:1.

Warner, Katherine. (1991) *Shifting Cultivators: Local Technical Knowledge and Natural Resource Management in the Humid Tropics.* Food and Agriculture Organization of the United Nations. University of Minnesota

Web Reference

Agriculture Department (Crop Husbandry).Lawngtlai district.http://agriculturemizoram.nic.in/downloads.html. (Retrieved June 8th 2014)

Census2011 (2011).Lawngtlai District: Census 2011 data. http://www.census2011.co.in/census/district/392-lawngtlai.html(Retrieved June 8th 2014).

Department of Tourism, Govt. of Mizoram. http://tourism.mizoram.gov.in/page/chapchar-kut.html (Retrieved June 9th 2014)

Department of Tourism, Govt. of Mizoram.http://tourism.mizoram.gov.in/page/thalfavang-kut.html (Retrieved June 9th 2014)

Rashtriya Sam Vikas Yojana Project, Lawngtlai District http://lawngtlai.nic.in/RSVP /profile.htm (Retrieved june 8th 2014)

Sule.S. (December 2006). The News in Proportion, http://www.indiatogether.org/2006/dec/agr-jhum.htm (Retrieved April 5th, 2013)

webindia123. Deforestation rings alarm bell in Mizoram http://news.webindia123.com/news/articles/India/20130319/2175168.html (Retrieved June 9th 2014)

APPENDIX I

APPENDIX I

QUESTIONNAIRES

	Sample No

I. Identification of the farmer.

1. Mobile number : _____
2. House number : _____
3. Town/Area : _____
4. Size of family : _____ . [Adult: _____ Minor: _____]

Tick the appropriate:

5. Religion:
   [Christian Hindu Muslim Other specify]
6. Social Group :
   [ST SC OBC Others]
7. Poverty status :
   [APL BPL AAY]
8. Land Ownership :
   [Owned-Land Owned No Land]
9. Dwelling House :
   [Owned Rented No dwelling house Others]
10. Ethnicity
    a. Lusei
    b. Lai
    c. Mara/ Lakher
    d. Chakma
    e. Kuki
    f. Hmar
    g. Other Specify _____

11. Tick the festival associated with jhum agriculture:-
    a. Chapchar Kut

b. Mim Kut

c. Pawl Kut

d. Thal Favang Kut

e. Others

(If others mention them) ----------

12. Whether jhum agriculture is your main occupation (Loneih ah chiah ami ei I zawng):

YES NO

If 'NO' mention the other sources of income (anih loh chuan I sum hmuhna hnar dang te

_____

13. . Number of workers in the family (Hnathawktu eng zat nge awm) :

_____

14. Income from non-agriculture occupation (Lo neih ni lo ah sum lak luhna hnar):

_____

15.

Year	**Size of holding(in acre)**	**Output(in quintal)**
2009		
2010		
2011		
2012		
2013		

16. Consumption requirement per annum of rice (Kum khat a mahni eitur mamoh zat):

_____

17. Amount of output marketed (Buh thar harlhchhuah zat):

_____

18. Social status 'NGO, YMA, MHIP, Churches etc' if any (Khawtlang ah nihna chelh lai I nei em):

_____

19. Any other allied sources (loneih nilo huan emaw ar vulh emaw leh thildang tih I nei em): _____

20. Production of commercial crops (Ginger, maize, cabbage, chillies etc) (Thlai dang tharchhuah, sum chang thlai Sawhthing, vaimim, zikhlum, hmarchha leh a dangte):

_____

_____

21. Is your present income sufficient for your family? (Yes/No)

If 'No how do you manage your financial shortage?

(Burrowing/ Selling domestic property/ Going for wage/ labour/ Any other specify _____)

22. Economic status: (Tick the appropriate)

(1. Self-supporting. 2. Earning dependent. 3. Dependent. 4. Non-earning dependent.)

23. Do you prefer jhuming than other mode of agriculture with reasons?

If Yes, _____

If No, _____

24. Are you growing crops under jhum again this year 2014?

(If Yes ,The area size of holding for 2014 jhum _____)

25. Annual Income _____

26. Annual Expenditure _____

27. Do you perform any work partnership (In Lawm)_____

28. Distance of Jhum land of latest (in Km)_____

II. . Socio-demographic characteristics

Sl. No.	Name of the family member	Relation ship with HH head (code 1)	Age (Year)	Literacy Level (code 2)	Occupation (code 3)	
					Main	Subsidiary
1						
2						
3						
4						
5						
6						
7						
8						

Code 1: 1= Household head, 2= Spouse, 3= Son, 4= Daughter, 5= Mother, 6= Father, 7= Brother, 8= Sister, 9= Grandfather, 10= Grandmother, 11= Grandson, 12= Granddaughter, 13= Son-in-law, 14= Daughter-in-law, 15=Brother-in-law, 16= Sister-in-law, 17= Niece, 18= Nephew, 19= Permanent labour, 20= Other relatives

Code 2: 1= Illiterate, 2= Infant, 3= Primary (Class I-IV), 4= Middle (Class V-VIII), 5= High School (IX-X), 6= Higher Secondary (XI-XII), 7= Graduate, 8= Post Graduate.

Code 3: 1= Agriculture, 2= Business, 3= Farm labour, 4= Non-farm labour, 5= Service, 6= Student, 7= Unemployed, 8= Religious work, 9= Other profession (Specify),10= Housekeeping, 11= Retired.

III. Pattern of human labour use for producing crops under Jhum

Labour Category	Number of labour used (Man-day)			Time of work (Code)
	Male	Female	Total Labour	
1) Cleaning & burning				
Family				
Hired				
2) Sowing & transplanting				
Family				
Hired				
3) Weeding & fertilising				
Family				
Hired				
4) Watching & guarding crop				
Family				
Hired				
5) Harvesting & carrying				
Family				
Hired				

Code: **1= January, 2= February, 3= March, 4= April, 5=May, 6= June, 7= July, 8= August, 9= September, 10= October, 11= November, 12=December.**

- Price of day labour (Tk/day): Male ....., Female.....
- Do you provide any meal along with daily allowance? Yes (1) No (2)
- If the answer is YES, how much and its estimated price.....
  ……..
- 1 man-day =..... Hours.
- Cost of making watching hut for jhum farming (Tk):
  ……

IV. Information on fertilizer and pesticide use on a specific hill for crop production

Fertilizer Type	Quantity used (kg)	Price (Tk/Kg)	Number of total use	Stage of used (code)		
				1st Time	2nd Time	3rd Time
Urea						
TSP						
MP						
Cow dung						
Insecticides						

CODE: 1= before planting/sowing seed,

2= during planting/sowing seed,

3= during growth stage of plant.

4= at the time of flowering,

5= just after initiation of rain,

6= other (Pl. specify)

V. Information of credit received (Last year: 2012),

Source of Credit	Loan Amount (Tk)	Interest Rate
Bank		
NGO		
Money Lender		
Relatives		
Cooperative Society		

- Beneficiaries of NLUP or any other Government programme (NLUP emaw sorkar atang tanpuina dang hrim hrim I dawng em):

YES NO

- If yes enter amount …….

- If yes enter Trade/activities under NLUP……

VI. Perception of farmers about Jhum cultivation:

1. Why you grow crops under traditional method like Jhum?

Reason for traditional	Ranking
1) For Livelihood	
2) Financial Hardship	
3) Jhum farming is our inherited practice	
4) Labour scarcity	
5) Other cultivation method is unknown to us	
6) Others (Please specify)	

2. What are the major constraints (risks) to crop production under Jhum?

Major Constraints	Ranking
1) Lack of cash money	
2) Scarcity of labour	
3) Insect and pests infestation	
4) Lack of HYV seed	
5) Huge crop loss (especially rice) due to heavy rainfall	
6) Scarcity of insecticides and their high price	
7) Crop damaged by livestock (cow/goat)	
8) Other (Pl. specify)	

3. What measures do you consider for elimination/minimisation of the problems?

Types of Measures	Ranking
1) Borrow cash from others	
2) Use insecticides	
3) Collect labour from other areas/locations	
4) Make fence round the crop	
5) Not taken any preventive measure	
6) Other (Pl. specify)	

Thank you for your time, your participation is greatly appreciated

APPENDIX II

APPENDIX II

Table-A2.2 LAND USE STATISTICS IN MIZORAM (A)

(Area in Thousand Hectares)

Sl.no	Particulars	2008-2009	2009-2010
I	Geographical area	2,108.700	2,108.700
II	Area for Land Utilization Statistics (1-5):	2,108.700	2,108.700
	1. Forest	1,593.700	1,585.305
	2. Not available of cultivation (a+b):-	133.000	102.188
	a). Land put to non-agricultural use	124.000	93.404
	b). Barren and uncultivable land	9.000	8.784
	3. Other uncultivated land excluding fallow land (a+b+c):-	67.226	44.158
	a). Permanent pastures and other grazing land	5.250	5.250
	b). Land under miscellaneous tree, crop and groves not included in net area sown.	51.976	32.208
	c). Culturable waste	10.000	6.700
	4. Fallow land (a+b):-	210.939	246.823
	a). Fallow land other than current fallow	170.850	180.800
	b). Current fallow	40.089	66.023
	5. Net sown area	103.835	130.226
	6. Total Crop Area	106.714	133.226
	7. Area Sown more than once	2.879	3.000
III	Total Irrigation Area	11.153	10.361
IV	Area Irrigated for the year	11.022	10.244

SOURCE: Statistical Handbook Mizoram 2010

Table- A2.3: LAND USE STATISTIC OF MIZORAM (B)

(Area in thousand hectares)

Sl.no	Particulars	2010-2011	2011-2012
1	2	3	4
2	Geographical Area	2,108.700	2,108.700
3	Reporting area for Land Utilization statistics (1-5)	2,108.700	2,108.700
4	1. Forests	1,585.305	1,585.305
5	2. Not available for cultivation (a+b+c+d)	86.712	86.794
6	e) Water logged land	-	-
7	f) Social Forestry	46.875	46.875
8	g) Land under still water	11.053	11.053
9	h) Other land	28.784	28.866
10	2(a). Barren & unculturable land	8.250	8.250
11	Total (2 + 2a)	94.962	95.044
12	3.Other uncultivated land excluding fallow land (a+b+c)	49.443	52.818
13	d) Permanent pastures and other grazing land	5.250	5.250
14	e) Land under miscellaneous tree-crops and groves not included in net area sown.	37.493	40.868
15	f) Culturable waste	6.700	6.700
16	4.Fallow land (a+b)	248.869	244.303
17	c) Fallow land other than current fallow	182.262	183.115
18	d) Current fallow	66.607	61.188
19	5.Fallow land other than current fallow	130.121	131.230
20	6.Total Crop area	132.756	133.956
21	7.Area sown more than once	2.635	2.726
22	Net Irrigated Area	12.123	12.700
23	Gross Irrigated Area	12.130	13.150

(-) Nil SOURCES: Statistical Handbook Mizoram 2012

Table-A2.4: BASIC INDICATORS (a)

Sl.no	Particulars	Unit	2009-2011	2010-2012
1	**State Income**		**2004-2005 Series**	**2004-2005 Series**
	a) GSDP at current price	Rs. lakhs	528393	605770
	b) Per Capita Income at Current Price	Rs.	43467	48591
	c) GSDP at Constant (2004-05) price	Rs. lakhs	417351	455672
	d) Per Capita Income at Constant Prise	Rs.	34456	36732
2	**Average Monthly Per Capita Expenditure**		**(2004-2005)**	**(2004-2005)**
	(Consumer Expenditure)		NSS 61st Round	NSS 61st Round
	a) Rural	Rs.	778.35	778.35
	b) Urban	Rs.	1200.51	1200.51
3	**Agriculture**		**2009-2010**	**2010-2011**
	a) Gross Cropped Area	' 000 ha	133.226	132.756
	b) Net Area Sown	' 000 ha	130.226	130.121
	c) Gross irrigated area	' 000 ha	10.361	12.13
	d) Area under Principal crops		2009-10	2010-2011
	I. Paddy	ha	47,204	40,692
	II. Maize	ha	8,551	9,005
	III. Pulses	ha	3,920	3,057
	IV. Oilseeds	ha	2,741	3,140
	e) Production of Principal crops		**2009-10**	**2010-2011**
	I. Paddy	M.Tonnes	66,132	67,429
	II. Maize	M.Tonnes	11,510	13,499
	III. Pulses	M.Tonnes	6,479	6,065
	IV. Oilseeds	M.Tonnes	2,988	3,727
	f) Agricultural Census		**2000-2001**	**2005-06**
	a. No. of operational holdings	Nos.	75,523	97,223
	b. Total operated Area	Ha	93,298	1,16,645
	c. Average size of holdings	Ha	1.24	1.2
4	**Livestock Census**		**2007**	**2011 (Projected)**
	a) Total Livestock	'000	364	423
	b) Total cattle	'000	34	35
	c) Total pigs	'000	267	329
	d) Total poultry	'000	1,234	1,369
5	**Forest (FSI Report)**		**2003**	**2009**
	a) Area Under Dense Forest	Sq.Km	7488	6385
	b) Area Under Open Forest	Sq.Km	10942	12855

Source: Economic Survey Mizoram 2011

Table-A2.5: BASIC INDICATORS (b)

Sl.no	Particulars	Unit	2010-2011	2011-2012
1	**State Income**		**2004-2005 Series**	**2004-2005 Series**
	e) GSDP at current price	Rs. lakhs	528393	605770
	f) Per Capita Income at Current Price	Rs.	43467	48591
	g) GSDP at Constant (2004-05) price	Rs. lakhs	417351	455672
	h) Per Capita Income at Constant Prise	Rs.	34456	36732
2	**Average Monthly Per Capita Expenditure**		**(2004-2005)**	**(2004-2005)**
	(Consumer Expenditure)		NSS 61st Round	NSS 61st Round
	c) Rural	Rs.	778.35	778.35
	d) Urban	Rs.	1200.51	1200.51
3	**Agriculture**		**2010-2011**	**2011-2012**
	g) Gross Cropped Area	' 000 ha	132.756	133.956
	h) Net Area Sown	' 000 ha	130.121	131.23
	i) Gross irrigated area	' 000 ha	12.13	13.15
	j) Area under Principal crops		**2010-2011**	**2011-2012**
	V. Paddy	ha	40,692	38976
	VI. Maize	ha	9,005	6905
	VII. Pulses	ha	3,957	3836
	VIII. Oilseeds	ha	3,140	5474
	k) Production of Principal crops		**2010-2011**	**2011-2012**
	V. Paddy	M.Tonnes	67,429	75566
	VI. Maize	M.Tonnes	13,499	8397
	VII. Pulses	M.Tonnes	6,065	5331
	VIII. Oilseeds	M.Tonnes	3,727	2382
	l) Agricultural Census		**2005-06**	**2005-06**
	d. No. of operational holdings	Nos.	97,223	97,223
	e. Total operated Area	Ha	1,16,645	1,16,645
	f. Average size of holdings	Ha	1.2	1.2
4	**Forest (FSI Report)**		**2009**	**2011-2012**
	c) Area Under Dense Forest	Sq.Km	6385	6283
	d) Area Under Open Forest	Sq.Km	12855	12900

Source: Economic Survey Mizoram 2012-2013

APPENDIX III

APPENDIX III

A3.1. Jhum land after clearing and firing.

A3.2. Jhum land during firing or burning.

A3.3. A hut (thlam) in Jhum land

Source: **Field Survey 2013-2014**

A3.4. A young man crafting a basket called ‘Emping’ in Thingkah Village.

A3.5 A Chakma’s old man in M.Kawnpui crafting a basket

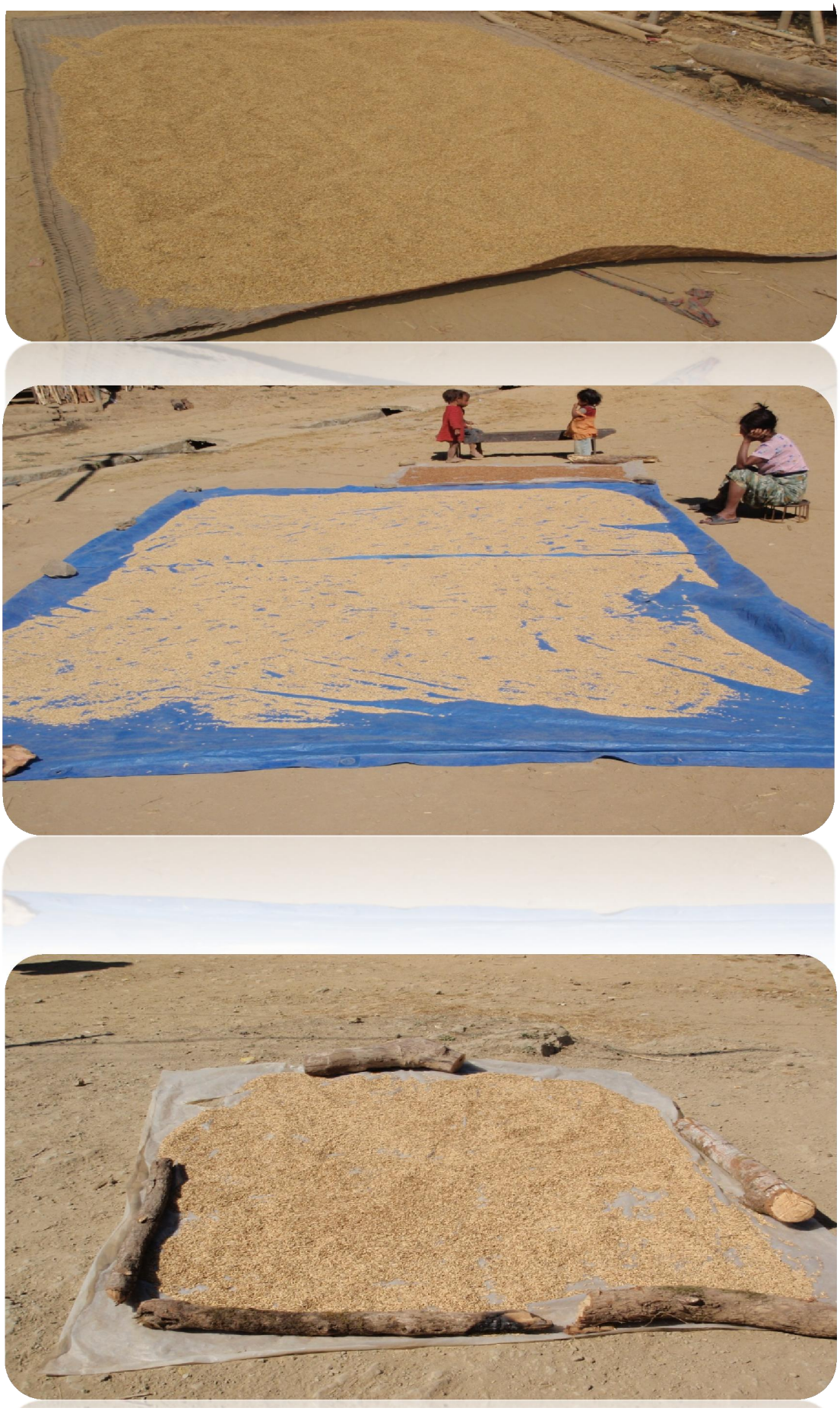
A3.6 Jhumias collecting crops from mix cropping

A3.7 A woman harvesting sesame seeds

Source: **Field Survey 2013-2014**

A3.8. Rice harvested storey called 'Zem'

A3.9. Rice dried in the sun before piling and storing.



Source: **Field Survey 2013-2014**