

**SHIFTING CULTIVATION TO SETTLED
AGRICULTURE: AGRARIAN TRANSFORMATION
AND TRIBAL DEVELOPMENT IN MIZORAM**

**Thesis submitted in fulfillment of the requirements for the
degree of Doctor of Philosophy in Social Work**

C. Lalengzama

**Department of Social Work
Mizoram University
Tanhril - 706004
Aizawl, Mizoram**

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CERTIFICATE

This is to certify that the thesis '**Shifting Cultivation to Settled Agriculture: Agrarian Transformation and Tribal Development in Mizoram**' submitted by C. Lalenzama for the award of Doctor of Philosophy in Social Work is carried out under my guidance and incorporates the students' bonafide research and this has not been submitted for award of any degree in this or any other University or Institute of learning.

This is being submitted to the Mizoram University for the degree of Doctor of Philosophy in Social Work.

Date : 12th February, 2016

Place : Aizawl, Mizoram

(Prof. KANAGARAJ EASWARAN)

Head
Department of Social Work
Mizoram University
Aizawl- 796004

(Prof. KANAGARAJ EASWARAN)

Research Supervisor
Department of Social Work
Mizoram University
Aizawl- 796004

DECLARATION

Mizoram University

February, 2016

I, **C. Lalengzama**, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University/ Institute.

This is being submitted to the Mizoram University for the degree of Doctor of Philosophy in Social Work.

Date : 12th February, 2016

Place : Aizawl, Mizoram

(C. LALENGZAMA)
Research Scholar
Department of Social Work
Mizoram University
Aizawl- 796004

(Prof. KANAGARAJ EASWARAN)
Head
Department of Social Work
Mizoram University
Aizawl- 796004

(Prof. KANAGARAJ EASWARAN)
Research Supervisor
Department of Social Work
Mizoram University
Aizawl- 796004

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(C. LALENGZAMA)

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LIST OF ABBREVIATIONS

AAY	Antyodaya Anna Yojana
AIMS	Agriculture Input Survey Mizoram
ANOVA	Analysis of Variance
APL	Above Poverty Line
BPL	Below Poverty Line
BSNER	Basic Statistics of North Eastern Region
DAC	Department of agriculture and Cooperation
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GOI	Government of India
GOM	Government of Mizoram
HDI	Human Development Index
HYV	High Yielding Variety
ICEF	India Canada Environment Facility
KM	Kilometer
LPG	Liquid Petroleum Gas
LSC	Land Settlement Certificate
MHIP	Mizo Hmeichhe Insuihkhawm Pawl
MNF	Mizo National Front
MNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MUP	Mizo Upa Pawl
NABARD	National Bank of Agriculture for Rural Development
NCIP	National Crop Insurance Programme
NEPED	Nagaland Environmental Protection and Economic Development

NER India	North Eastern Region, India
NERCORMP	North-Eastern Region Community Resource Management Project
NGO	Non Governmental Organisation
NLUP	New Land Use Policy
PHC	Public Health Centre
PHE	Public Health Engineering
PLP	Periodic Land Pass
PMKSY	Pradhan Mantri Krishi Sinchai Yojana
PRA	Participatory Rural Appraisal
RKVY	Rashtriya Krishi Vikas Yojana
SGDP	State Gross Domestic Product
SHGs	Self Help Groups
SPSS	Statistical Package for Social Sciences
ST	Scheduled Tribe
TV	Television
UPC (M)	United Pentecostal Church (Mizoram)
UPC (NEI)	United Pentecostal Church (North East India)
VC	Village Council
YMA	Young Mizo Association

CHAPTER I

INTRODUCTION

The present study attempts to assess the impact of agrarian transformation from shifting cultivation to settled agriculture among the tribals in Mizoram.

Shifting cultivation also known as Jhum or Swidden agriculture has been viewed as one of the challenges to tribal development in India over many decades. According to the tenth five year plan, shifting cultivation has remained as one of the unresolved issues of planning for tribal development in India (GOI, 2014).

Historically, the word agriculture has been used synonymously with the word farming. It is often associated with images of a farmer and his family planting harvesting crops and rearing animals (Wildman and Torres 2001). Historical evidence suggests that domesticating animals and cultivating land to produce food, fiber, and shelter allowed humans to proliferate (Rosmann, 2010). This marked a revolutionary change in human societies from food gathering to food production. In fact the origin of shifting cultivation could be traced back to as far back as the Neolithic period between the years 1300 to 3000 B.C (Ninan, 1992). Sharma (1976) believes that the system of shifting cultivation to have originated in the Neolithic Period around 7000 BC.

Shifting cultivation is accepted as an early stage of agricultural evolution which is practiced in different parts of the world across different culture (Rolwey & Conway, 1984). About 36 Million Square Kilometers of land or about 30 percent of the world's exploitable soils are under shifting cultivation. They produce bulk of food for more than 250 million people or about 8 percent of the world population. Shifting Cultivation is not only practiced in India, but it is widely persistent among the indigenous communities, particularly in Africa, Latin America and parts of Asia. Tribal communities and hill people from time immemorial have practiced shifting Cultivation in India. About 10

million hectare of tribal land stretched across 16 states is estimated to be under Shifting Cultivation in India. It is also widely practiced in the hill regions of North Eastern States of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura (FAO, 2014).

Shifting cultivation is the cropping system encompassing horticulture, annual permanent crops, animal husbandry, and management of forests and fallows in sequential or rotational cycles (Thrupp et. al. 1997). Broadly speaking, these systems involve the cutting of a section of a forest, burning, planting of a variety of crops, harvesting and then moving on to cut a new patch of land after certain years of cropping seasons (Thrupp et. al. 1997). The process of land preparation includes clearing of field by felling, cutting, slashing and burning. In many places in Europe, for instance, the practice is known as "swidden" agriculture (Pelzer 1978). It has a great amount of diversity in its land use system, and methods of cropping. The most remarkable feature of Shifting Cultivation is that almost all varieties of cereals and vegetables are grown in one jhum field, which is rather impossible to have in wet plain land and cultivation fields are usually located away from villages (Sharma, 1976). Shifting Cultivation is practiced in regions where technologically advanced systems of agricultural have not been economically or culturally possible or in regions where land has not yet been appropriated by people with greater political or cultural power. Use of vegetative cover as soil conditioner and sources of plant nutrient for cropping cycle is common in this method of cultivation. Crops are primarily grown by shifting cultivators for subsistence but the yields are often low than that of Settled Agriculture. The basic principle of Jhum cultivation is the alternation of short jhum cycle - usually one or two years of cropping with phases of natural or slightly modified vegetation fallow. The stability of the shifting cultivation lies in retaining a minimum length of the fallow period before the farmer returns to the same site for

another cropping phase (Darlong 2004). It consists of highly diverse land use systems that vary from mountain to lowland ecosystems and from tropical forests to grasslands (Spencer 1966; Sharma 1976). According to Danda (1998:148-149), shifting cultivation is mainly practiced by people of relatively simpler cultures or small population and it is primary dependent on human labour and simple tools operated by hand. Geographically, the jhum culture is mostly confined to the tropical rainforests characterized with heavy rainfall, subsistence economy and hot weather (Das & Das 2014). The spirit of co-operation is where the pattern of labour involvement is based. The customary law control the shifting place of fields in sequence and multiple as well as special cropping pattern are observed in shifting cultivation.

Shifting Cultivation is an extensive system of agriculture which is mainly practiced in areas of relatively low population density where the farmer has enough land and the societal pattern gives freedom to cultivate anywhere he chooses in a specified geographical unit or region. A diversity of shifting cultivation system is practiced in different historical, environmental and socio economic situation in Africa, Central America, South East Asia and Oceania. The countries where this system is prevalent and names used for the systems are 'Milpa' in Central America, 'Coamile' in Mexico, 'Comuco' in Venezuela, 'Roco' in Brazil, 'Masole' in Belgium, 'Chitemere' in Central Africa, 'Locy' in Madagaskar, 'Torungya' in Burma, 'Tamrai' in Thailand, 'Voy' in Indo China, 'Karen' in Japan, 'Ladong' in Indonesia, 'Humoh' in Java, 'Diumog' in Sumatra and 'Cagin' in Phillipines, Chitememe in Zambia and 'Chinampa' in Tropical America. 'Chena' in Sri Lanka, 'Sartage' in Ardennes, Gudia, Bagda, SarbanDongerchara or Podu in Southern Orissa and Peuda in Madhya Pradesh and as 'Podu' among the hill Reddies of Andra Pradesh .It bears different names in other communities even in the north east India in Meghalaya it is known as 'Bogma' among the Garos. 'Lyngkhalum' or 'Shyrtil'

among the Khasis, 'Rit' among the Mikirs of Assam, 'Tekonglu' among the Ao Nagas of Manipur.

Although Jhum is one of the oldest systems of agriculture, it has been under attack in recent times. In spite of its pivotal role in the culture and livelihood of tribal societies, shifting cultivation is often perceived as threat to the forests ecological system and it has been often associated with large-scale deforestation. As shifting cultivation is always attended through clearing and burning of forests which destroys forest and the environment around us (Misra, 1976) causes calamities like flood, drought, soil erosion (Das 1976; Agarwal 1985), and more recently the Global Warming (Lanly 1985). In the mean time Majumdar, (1977) observed that Shifting Cultivation is still regarded by the villagers as a sure method of producing food crops. Despite all the shortcomings, jhuming cannot be stopped completely as the lifestyle and cultural ethos of the tribal people is closely governed by jhuming operations. This has led to major debates in the policy making arenas on the continuance of shifting cultivation as a viable mode of agriculture. The government and some initiatives always try to protect environment and forests' resources by rejecting and opposing the practice of shifting cultivation. While introducing jhum, suggested changes and prepared policies should be socially acceptable, economically viable and environmentally sustainable (Majid 1993). The government cannot provide a replacement therefore shifting cultivation is still declared as the main source of livelihood even though it destroys forests ecology. The people who practice it cannot be blamed because it is their means of livelihood. In the mean time Zabid (1993) concludes that shifting cultivation is not a stumbling block in the development of ecosystem in North Eastern India provided that it is practised on limited areas with long jhum cycles. Shifting Cultivation is a means of subsistence therefore it cannot be given up rapidly. He suggested that the existing jhuming has to be reset at higher levels but without

disturbing the ecological balance and future technology must be in the interest of the traditional people and local environment to ensure on overall eco-development. Therefore the issue of shifting cultivation is an endless debate.

There are two views on shifting cultivation which has been categorised in the '*ecological implication*' and '*Socio Economic implication*' that advocate about the impact of shifting cultivation. The Government of India's report of 1995 also accepted shifting cultivation as a major cause of land degradation because it degrades natural landscape through soil erosion and destroying forests and in the mean time agricultural productivity and income of the shifting cultivators has constantly declined. The *Outsider's View* which is similar to *ecological implication* has its origin in the late 19th and early 20th century having its roots in European colonial administration in tropical and sub-tropical South Asia, Southeast Asia, and South America. The outsider's view criticizes shifting cultivation on grounds that it dries up the springs of the hills, causes soil erosion, destroys valuable forests and adversely affects rainfall and deprives people of benefits of forest produce (Thangam 1984).

On the other hand the '*Socio Economic implication*' also believed shifting cultivation as a major source of livelihood and a way of life to the people. In the mean time consistent scientific studies have been suggesting an optimal and careful utilization of natural resources which will stabilise and sustain agriculture (Ramakrishna, 1993; Sharma, 1992). Therefore it is very important to control and improve shifting cultivation to protect ecology and crop productivity. On the other hand the 'insider's view' recognize the relationship between natural resources and social relations. It supports the view that resources are cultural assessment, where actual objects are frequently translated into cultural envision by obtaining of materials from the environment and their alteration and circulation through social relations and by giving the material a value which will indicate

how important it is to obtain it, circulate it or alter it. In such a system, environmental weight is interceded through social relations (Ellen 1982).

Ecological Implication

Shifting cultivation unfolds the history of man as a cultivator as it is one of the oldest forms of agriculture (Warner 1991), but commonly known by its name “slash and burn agriculture,” has been deemed outdated and destructive by development institutions (Brady, 1996; Thrupp et al., 1997; O’Brien, 2002), destructive, wasteful, since the colonial era (Dove, 1983) a threat to tropical forests regarded by biologist, foresters and conservationists (FAO 1957; Raman, 2000). The view of shifting cultivation effect on ecology grew stronger in the 1950s due to the work of Thomas (1956) and Bartlett (1956). The ecological impact of shifting cultivation has been a serious concern for the scholars, agriculture scientists, anthropologist, and economists for many years and they argue that shifting cultivation is primitive in nature and the contemporary manifestations of their view towards shifting cultivators are often political in nature (Gadgil and Berkes 1991; Lowenthal 1989). So it has to be stringently dealt with as conclusions are made based on the scientific data and experiments conducted worldwide that the effects of shifting cultivation are very destructive (Rao & Hajra, 1986; Lal & Prajapathi, 1990; Gerber and Veuthey 2010; FAO, 1984; Tawnenga et al., 1997). The arguments range from low technology, pollution and soil degradation (Das 1976; Gupta 2000) to the loss of forest cover (Majid 1993; Biswas and Ghosh 1976; Govind 1989), low productivity (Burmon 1977: 61; Peterson, Gafur and Borggaard 2003: 118; Nunthara 1981: 1237), and the low market value of the crops which were not for generation of revenue but were consumption oriented. Deforestation, one of the major implications caused by shifting cultivation is often viewed as one of the most important environmental problems of South East Asia (FAO, 1995; Seidenberg et.al. 2003; Temudo and Silva 2012; Navarrete and

Jansen 2015). According to a study, about 40% of the land surface of the earth was converted into croplands and permanent pastures by early 1990s (WRI, 1996). More than 6% area under tropical forests was converted into shifting cultivation between 1980 and 1990 and about 10% of forestland was converted into shifting cultivation in Asia during the same period (Detwiler and Hall, 1988; Van Vliet et. al. 2013; Gerber and Veuthey 2010). The studies on ecological impact of shifting cultivation have also been carried out by Tawnenga (1990), Tawnenga & Tripathi (1996), Bose, Ghatak and Bera (1982), Tawnenga et al., (1997), Zaitinvawra and Kanagaraj (2008), Lalengzama (2011); Lalengzama and Kanagaraj (2013). Clearing forests for shifting cultivation can cause adverse climate change, loss of biodiversity, reduced timber supply, flooding, siltation, soil degradation and change of forest vegetation from primary to secondary and eventually to grassland (Holden, 2001; Nye and Greenland 1960; Hajghani et. al. 2014) where burning is also regarded as the main reason of deforestation (Seidenberg et. al. 2003; Monela and Abdallah, 2007; Zahabu, 2008; Temudo and Silva 2012). Air pollution due to burning is one of a common feature in the areas where shifting cultivation is practiced (Tiwari, 1991; Dwivedi, 1993; Bose, Ghathak and Bera 1982; Northe et. al. 2014). Khataniar (2014) defines a new trend of migration in the beginning of the 19th century in north east India where large scale immigration population from neighbouring countries like Nepal, Bangladesh coupled with natural increase of indigenous population have led to population explosion, thereby putting tremendous pressure on the forest. They cleared the forest areas and turn it in to agricultural land and large scale deforestation occurred during the colonial rule in India. Increasing population had always played an important role in deforestation.

Soil erosion is mainly caused by the loss of vegetation cover in the hilly areas (Das 2011; Shoaib et al., 1998; Sfeir Younis and Dragun, 1993; Agarwal 1985). In

Mizoram, the Jhum cycle (Goswami 1980; Saha 1976) has been reduced from 20-30 years to 3-4 years which accentuated soil erosion and loss of nutrients from top soil. About 16.84 metric ton of soil per hectare has been lost every year and therefore the fertility of soil has been greatly reduced. The loss of top soil has resulted in low production of cereal crops from the shifting cultivation (Prasad and Rinawma 2014). In Mizoram, 1.5 % of total area is being affected annually by shifting cultivation (Maithani, 2005) that costs about loss of Rs. 1 billion forest resources (Lalkhana, 1985).

Majority criticize the tribal people for their adherence to shifting cultivation. In the mean time some studies acknowledge the importance of shifting cultivation in the past where land was available in abundance with less population. However they reject it in present situation (Webb 1966). There are others such as who criticise how Indian state successfully adopted alternatives to jhum cultivation in Tripura allowing tribal very limited autonomy over their agricultural practices without completely altering the existing method (Gupta 2000: 605).

Nevertheless, outsider views continue to dominate policy making even during the postcolonial era. According to Myers (1991), the impact of this postcolonial developmental strategies have marginalised the traditional farmer's life to destitution which was pursued by national governments and international agencies. Employing instruments of economic and social development the World Commission on Environment and Development (1987), disrupt shifting cultivation systems. In India also, policy studies have been conducted to highlight popularity and efficiency of Jhum cultivation. To name a few, the report of "Dhebar Commission" (1960-61), the report of the "Task Force of the Planning Commission on Development of Tribal Areas" (1973), the report of the "National Commission on Agriculture" (1976), the report of "FAO/ UNFPA" (1978), "Task Force on Shifting Cultivation of the Ministry of Agriculture" (1983), the "Shukla

Commission Report" (1997), the "Rajamani Committee Report" (1997) and the Report on the "Task Force on Strategy for Management of Shifting Cultivation" (2002). Almost all of them hold a critical view of shifting cultivation and their suggestion concludes that the practice of Jhum mitigate soil erosion and destruction of forest wealth. All the reports have proposed a replacement of shifting cultivation by permanent agricultural practices through terrace cultivation or wet-rice cultivation and other agro forestry schemes.

Socio Economic Implication

On the other hand the '*Socio Economic Implication*' held that land is communally owned and cultivated among the tribal people and they do not aim to make a profit from the agricultural surplus. The productivity of shifting cultivation economically may be assessed by the number of people supported by it. Shifting cultivation is productive as its practices have supported relatively large populations. Shifting cultivation traditionally contributes to conservation of agro-biodiversity, acts as an effective form of land use and utilizes space optimally supporting about 60 varieties of crops in a particular time and space. Shifting cultivation of the Mayans in Mesoamerica also supports 100-200 people/sq km (Tripathi, et al., 2003; Thrupp et al., 1997).

Majority of the studies on shifting cultivation in India has been undertaken from an ecological perspective and studies on the socio-economic dimension of shifting cultivation are few. Some recent studies, especially by the noted researcher P.S. Ramakrishnan (2003) and his group have explored the role of traditional ecological knowledge behind the diversity in the practice of Jhum. Shifting cultivation is not just an old agricultural practice, but was intrinsically related to the culture and identity of those practicing it (Schendel 1992). Shifting cultivation helps to conserve the rich culture and tradition of more than 200 tribal races, inhabited in the north-east region as long as shifting cultivation continues as Jhum is interwoven into their cultural diversity. So the

tribal judiciously used natural and forests resources and have the experience to deal with the uncertainty and unpredictability which are fundamental to all ecosystems (Kanagaraj 2014; Zaitinwawra & Kanagaraj 2008; Folke, Colding and Berkes 2000: 1251). Some studies have also shown that shifting cultivation is quite sustainable to restore ecology. A report from the Ministry of Environment and Forest (1997) shows that 1700 sq km area was gained from shifting cultivation mainly comprises of scrubby vegetation. This growth also helped in checking soil erosion from the hilly slopes. Forest clearance followed by long fallow period, small-scale high-intensity mimic disturbances in forests may be a sustainable form of land use (Andrade & Rubio-Torgler, 1990; Bose 1976; Gerber and Veuthey 2010). It may enhance biodiversity in the landscape by creating new habitats (Gadgil & Guha, 1992; Kricher & David, 1992). In Mizoram, the major source of livelihoods is shifting cultivation as the Agriculture Department Report (2009-2010) indicates that more than 20% population directly and indirectly engaged in shifting cultivation. Shifting cultivation supports 23 people/sq km, which is doubled to the number of people supported by commercial cultivation in the tropical regions of Kalimantan, Indonesia. Mizoram state noticed 1.4% increase in forestland from 1991 to 2011. In 1991, the total forest area of Mizoram was 18853 km². In 2011, it increases up to 19117 km. Meanwhile, many neighboring states such as Nagaland and Manipur received decrease in forest land (7% and 3.4% respectively).

However, the emphasis on modern methods label shifting cultivation as a primitive method used by indigenous people (Das 2006: 4912), and also disregard traditional knowledge systems and their capability of improving existing methods (Lalenzama & Kanagaraj 2012; Zaitinwawra & Kanagaraj 2008; Folke, Colding and Berkes 2000: 1251). There are some studies which conclude shifting cultivation as one of the most scientific methods because of the geographical and ecological conditions of the

region in which it is practiced. It cannot retain water and get adequate fertilisation on hilly slopes and this was the primary reason for the tribal to practice jhum cultivation. According to the FAO, UNDP and UNEP, the main causes of deforestation and thus carbon emission in Asia have been intensification of agriculture and large-scale direct conversion of forest for small-scale and large industrial plantations, and not shifting cultivation. In fact, according to the FAO's own definition of forest, shifting cultivation does not cause deforestation but forest modification. Moreover the Jhum cycle is still long as the population is still less (Borthakur 2002; Majid 1993; Patnaik 1982; Goswami 1980; Saha 1976). Shifting cultivation was sustainable during the past decades as the fallow period of shifting cultivation was long (Cochet 2014; Luoga, 2000; Goswami 1980; Saha 1976; Nye & Greenland 1960). However, the fallow period for shifting cultivation has been reduced from 20-25 years to 2-3 years which may be due to increased population pressure resulting in high demand of cereals and growth of demands for forest products (Mwampamba, 2009; Batterbury 2007; Luoga, 2000; Bose 1976). With the view of negative consequences of the shortening of the fallowing phase, sedentary agriculture which is continuous cropping in the same fields and without fallowing recommended by scientists is promoted through governmental policies as an alternative to replace and shifting cultivation (Borggaard et al., 2003; Fox, 2000; Cairns and Garrity, 1999; Brady, 1996). Decreasing fallows have been proposed as a management to negative impacts of shifting cultivation in the tropics (Nye and Stephens, 1962). Introducing cash crops is not a best solution for stabilizing shifting cultivation because it requires prior in-depth thought about the socio-economic conditions and suitable research (Ducourtieux et. al., 2006).

An intense difference between shifting cultivation and settled agriculture concerns land and its ownership. Land used under shifting cultivation is communally owned, but

land under settled agriculture assured economic gains only under individual ownership of land and cultivation. In the mean time shifting cultivation also adversely impact economy of the cultivators. Some researchers from the productivity point of view used high frequency and intensity as a criteria to term shifting cultivation as unproductive and uneconomical. Cultivation usually takes place in communally owned land any criticism on jhum cultivation indirectly meant criticism on the way of life and culture of the tribal people as the cultural life of tribes is intrinsically linked to it (Arens 1997: 1181) and introduction of modern agricultural practices meant the disapproval of traditional knowledge system of the indigenous people (Das 2006: 4912). A very important question which needs to be answered for those in favour of shifting cultivation is the reduced availability of land because of the increase in population (Lalengzama & Kanagaraj 2012; Zaitinvawra & Kanagaraj 2008). Will jhum cultivation still be effective and self sufficient method without damaging the environment? This persuaded some scholars and policymakers to propose alternatives such as terrace and settled cultivation (Patnaik 1982; Burmon 1977; Majumdar 1977). Scholars have emphasized shifting cultivation as a strategy of resource management in which fields are shifted to exploit the future site (Grath 1987: 223). The emphasis on strategy and agro-ecosystem dynamics makes shifting cultivation neither a static nor necessarily stable system of agriculture but one that is flexible in response to change (Grath 1987; Beckerman 1987; Raintree and Warner 1986; Boserup 1965). These changes are usually brought by experimentation through trial and error.

Sedentary cultivation is not the only alternative to shifting cultivation. The sedentary system, however, lacks the multiple benefits including soil regeneration as well as forest products (Liang et al., 2009). In the mountainous areas where the introduction of sedentary agriculture is much constrained the rotational agro-forestry system may be

promoted as a viable option for development of the shifting cultivation system (Liang et al., 2009). Agro-forestry is a potential sustainable alternative to shifting cultivation (Lal, 1989). Some civil society organizations in Gorkha and Tanahun districts of Nepal have promoted the modification of shifting cultivation in land using contour hedgerows and fruit integration such as pineapple and banana which are beneficial in reducing soil erosion, and improving crop and soil productivity in sloping and shifting cultivation lands (Kafle 2011).

Besides, the Improvement Approach and Replacement Approach by Borthakur (2002) also mention that shifting cultivation should be approached to replace or continued with improvement and modification through government policy. Jhum should be modified gradually step by step to make it environmentally sustainable (Tawnenga and Shankar 2014). The government alternatives to shifting cultivation focused on settled cultivation coupled with development schemes on horticulture, cash crops, animal husbandry, and fruit cultivation are criticised as being assimilationist in nature (Zaman 1982). Moreover, the tribal have to pay taxes to the government from their product which was rejected by many scholars because it is a way of forcibly integrating ethnic minorities with the state (Ludden, 2003). Measures to alter jhum cultivation have created economic uncertainties for the tribal, and settled cultivation has forced them to unwillingly assimilate and compete into the national economy which in turn makes them a prey for capitalist (Zaman 1982).

Steps Involved in Shifting Cultivation

The steps or activities involved in Shifting Cultivation varied according to Terrain, Climate, geographic condition, distance manpower and nature of crops. The steps followed in Mizoram are also present in every form of shifting cultivation of Amazon,

Africa, and South-East Asia, with the presence of diversity as well as similarity in their practices (Warner 1991).

Step 1: Selection and Demarcation of Sites

In the stage of site selection and clearing, shifting cultivators in the humid zones of Amazon basin and South-East Asia prefer land located between a primary and a secondary forest which are more fertile. Africans, on the other hand, do not have the access to primary forests due to its rarity (Okigbo 1982). Distance from the village and accessibility of the site throughout the year, potential crops and labour availability, as well as Supernatural constraints such as sacred grove, presence of spirits have a tremendous impact on the selection process. Colour of the soil is another important aspect of site selection. The selection of black or dark soils is regarded as best for cultivation supported by laboratory analysis in Amazon (Balee 1989; Johnson 1983). Attempts are made to match specific soils to specific crops in Philippines for the best combination. Termite mounds are often favoured for shifting cultivation in Africa as it contains higher levels of bases, soil water, organic matter, silt, and clay. (Nyamapfene 1986; Arshad 1982; Mielke 1978).

The process of Jhum cultivation Mizoram also starts with allotment of land as per size of work force and selection of land as per hierarchical system or social stratification system. In Mizoram Jhum land is exclusively owned by the community but the power of disposal will be exercised by the Chief in the past and the Village Council in the present times. Each village had their own land demarcated by stream and hills etc. The selection of land for cultivation for the next year is mainly done by the chief and village council. The allotment of land is done through a lottery system and demarcate properly. The size of plot will be selected based on the size of families and number of working force usually ranging from one to three acres (Thangchungnunga, 1997). Supernatural constrain like

the presence of trees without branches, skull of monkey and many other also imposed lots of restriction in selection of sites because of the fear of evil spirit. Occupant of the plot does not have the right to sell the allotted plot but he is permitted to transfer his land right to the person belonging to his community and to the same village. Right of alienation belongs to the community not to the individual (Roy Burman, 1970).

Step 2: Site Preparation

The determination to clear the selected site is the second stage in the process of shifting cultivation. The size of the field is determined by constraints of time and labour and sometimes large fields are a symbol of social prestige which are influenced by timing of clearing, celestial signs, wind pattern, and variation in rainfall (Engel et. al. 1984; Debasi-Schweng 1974). In Philippines, the presence of the constellation *Secreter* at approximately 20 degrees above the horizon is a primary indicator, the beginning of the *megenihan* wind from the east is the secondary indicator (Schlegel 1979).

The step two occurs mainly between the months of December to March in Mizoram. In the month of December to January the farmer involve in the felling of small trees /Shrub pollarding of the medium size trees and pruning or girding of the larger trees. This stage is the hardest and the toughest stage usually done by male members of the family. After the clearing of jungle they are left to dry and this period is called *Chapchar* in Mizo. However choosing the time to burn is difficult in humid zones due to distribution in rainfall. Especially in Amazon and Southeast Asia, burning remains an uphill task as it receives rainfall almost throughout the year. The elders and village council decide when to burn the field in Mizoram. In the month of February to March the farmers create fire lines known as '*mei lam*'. Farmers cut and clear a strip of forest three to four meters before they set fire to the areas to prevent forest fire and it is mandatory. Sometimes the

fire left some dried pieces of wood, shrubs pruned branches etc. unburned. The farmer will collect it and burned again in some areas in the field known as '*mangkhawh*'.

Burning is essential for bringing beneficial effects for the crops and it also helps in weeding (Rambo 1981; Uhl 1983). Variation in burning schedule is practised often as a risk management strategy. A community and family with several fields generally burn one field at a time in order to increase the odds against heavy rainfall but Africa has a good spell of dry season ideal for a burn (Warner 1981; Harris 1973). This brings difference in religious beliefs of communities. In the equatorial regions, for instance, prayers are made for preventing rain, whereas in dry places like Africa, on the other hand, rain is considered as a blessing (Vickers and Plowman 1984). There are also insights where reliance on environmental indicators help cultivators prepares their burning schedule (Richards 1985).

Step 3: Sowing of Seeds

After burning, it is time for planting crops. Shifting cultivators in humid areas prefer to start planting immediately after burning their fields. On the other hand priority is given to absorption of burnt nutrients by the land in areas with a long dry season (Porter 1970). After a careful observation to understand the dynamics of rain certain cosmological effects like climatic shifts in winds, cloud movements, and color of the sky are studied and discussed (Schlegel 1979; Freeman 1970). Events like swarming of termites, leafing of specific plants and songs of certain birds are interpreted as an indicator for rains in Africa and Southeast Asia (Richards 1985). Crop specificity is another cardinal matter considered while planting. Specific varieties of crops which do well in dry conditions are planted first, which later are replaced by crops demanding moist conditions. The field has a different pattern of crops in the way it is grown and different crops are placed according to suiting conditions of various microclimate

conditions (Padoch and de Jong 1987; Stigter 1984; Harris 1976; Wilken 1972; Rappaport 1971).

After burning among the tribe in Mizoram the works of the female member starts and sow crops and seedlings. A hut also known as '*Thlam*' is constructed in the field for resting place. Mostly the sowing of seeds are mainly done by the household at the same time. Sowing is mainly done between April to May just before monsoon rains. In the month of May to June sowing of seeds like Rice, Maize etc. are mainly carried out.

Step 4: Weeding

Similar to crop specificity, weeds are also considered an integral part of agricultural landscape (Alcorn 1989). Many weeds are not removed because it served the farmers as food although they are not included during planting. Research in the Amazon shows that half of the plant species growing in a field are not planted as a crop (Balee and Gely 1989; Alcorn 1989). In addition to weeds, farmers also have to deal with pests like birds and animals, which raid the crops during the growing stage (Poulsen 1978).

Weeds come up automatically very after burning in humid region and the weeding process in Mizoram is divided into four stages. The first weeding stage is known as '*Hnuhpui*' and it stated in the month of April after the sowing of paddy. The second weeding known as '*Hnuhhram*' is in the month of May to June. The third weeding known as '*A thual*' is done in August followed by the last weeding known as '*Pawhchhiat*' in September to October. The last day of weeding is celebrated inviting friends and relatives in the field. Weeding is mainly done by male and female and they used to make a group and work in their field in turns which is known as '*In lawm*'. After weeding is over they wait for the harvest and they involve in other work such as hunting and fishing.

Step 5: Harvesting

Harvesting is the most enjoyable moment for farmers in the stage of cultivation. Crops of different varieties are harvested. Seed crops like rice, millet, and maize are less flexible in this regard than root crops like cassava. The indigenous knowledge system influenced processing of crop varieties where different cultivars are processed differently according to the varieties. Rice grown at higher altitudes are harvested in the month of September and which are grown at lower place are harvested in the month of October. A threshing ground is prepared near the hut in the field when harvesting time approaches. Husking and cleaning are performed once threshing is completed. Rice is labour intensive and to avoid the threat of rain the harvesting of paddy is mainly done within a short time and all the members of the family including children are in the field.

Step 6: Storing and Transportation

After threshing and winnowing, the grains are stored in granary made of bamboo in the field for temporary storing. From the temporary storing the grains are transported from the field to the village by human labour known as '*Buh chhek*'. Lastly, forest regeneration is an important task in shifting cultivation to maintain succession. Various criteria are applied in humid tropics to achieve this goal. Uhl (1983) emphasised on the importance of 'microsites' of trees and logs, which are bred for re-establishing forests in Amazon. Microsites are the microhabitats of woody species that provide favourable microclimate for seedlings, which are developed from dispersed seeds, left by pollinators.

1.1. Shifting Cultivation among Tribal in North East India

According to 2011 census, India is inhabited by a population of 1.21 billion with a decadal growth of 17.64% between the years 2001-2011. The population of Scheduled Tribe (ST) reaches 104,281,034 persons which constituted 8.08% of the country's total population. India has the largest tribal population in the world next to African countries. India is a large country with substantial agricultural diversities. There are 705 groups of tribal and have lived in about 15% of the geographical area of the country, mainly in forests, hills and undulating inaccessible terrain in plateau areas which are rich in natural resources. Cultivators and agricultural labourers (54.6%) form over half the working population of total population (Report of High Level Committee on Socio economic, health and educational status of Tribal Communities in India 2014).

Only 0.32 percent of the total geographical area of India comes under shifting cultivation. On an average, estimated 38.69 thousand hectare area is set under shifting cultivation every year and 4,43,336 families earn their livelihood from such practice (Tripathi and Barik 2003). Agriculture is the primary source of income for more than 55% of the total population and produced 257.13 million tons of food grains during 2012-2013 (India, 2015). The share of agriculture in national income is often taken as an indicator of economic development. The sector provides employment to 48.9 per cent of the working population of India and contributing about 13.9 per cent of the Gross Domestic Product of the country (GOI, 2014).

The practice of shifting cultivation is spread across sixteen states in India (Eswaraiah 2003). In India Shifting Cultivation is practiced by the tribal living in North and North Eastern Region, Central and West India, Tribal region of the Deccan Plateau. The North and North Eastern Region are inhabited with the tribes of Naga in Nagaland and Manipur, Tribes of Mizo in Mizoram and Manipur, Abor in Arunachal Pradesh,

Garos, Khasi and Jaintia in Meghalaya, Mikir and Bodo in Assam, Mog and Chakmas and Riangs in Tripura. The Central and West India are inhabited by Saora, Salsor, Faria, Khond, Ho, Gond, Bhil, Muria, Mavia, of Madhya Pradesh and Kalki, Kathari, Kumari, Maratha, Maria Gond, Takur and Wakhal of Maharashtra. The region of the Deccan Plateau are inhabited by Kurnbi, Bagata, Gadba, Kamar, Khord, Kondakapur, Kona Reddi, Koya, Mali, Manna Dhor, Nayak, Porya, Rena, Samanthu and Sarva of Andhra Pradesh; Soliga, Bettakuruba, Jenukuruba, Kuman, Kunbi, Malakudia, Marathi of Karnataka, Irular, Kader, Kuruma, Kurichiya, Mudnagar and Paniyan of Kerala; and Kada, Kurumba, Malasar, Palayan and Paniyan of Tamil Nadu.

North-east India is the meeting point of South Asia, South-east Asia and East Asia. The political, economic and ideological developments in each of these sub-continent are similar to the parts of north-east India as many of the tribes in north-east India have their counterparts in the adjoining countries (Burman 1989). Geographically, north-east region of India (NERI) stretches between 21°50" and 29°34" N latitude and 85°34" and 97°50" E longitude. The north-eastern region covers a geographic area of 2,55,143 sq. km inhabited by 4,54,86,784 population with different tribes and ethnic groups. The estimated cropped area within North East India is 32,26,000 hectares which is only 1.62% of the whole cropped area in India. The population of North-east India accounts 3.75% of the whole population of India in 2011 census. The tribal population in NER is 1,24,15,054 which constitute 27.29% and the number of households is 93,38,972. The average size of family in NER is 4.9. The working population is 1,81,40,505 persons and 64,97,569 persons engage in cultivation, 26,75,295 persons are agricultural labour. The cultivation of land in the region is of two types, one practiced on permanent and well developed lands known as settled agriculture and the other on the hill slopes of Jhum land called Shifting Cultivation or jhuming. The settled agriculture is mainly confined to plains and valleys

and to some extends foothills and terraced land on gentle slopes, the total is only 13.31 percent of the geographical areas (GOI 2011).

Shifting cultivation is also known as 'Jhum' in North-Eastern States of India and is practiced traditionally. According to some scholars, Jhum as an agricultural practice has been brought to North East India by people who once migrated from South West part of China. The word 'Jhum' has undergone various phonetic changes during the time of migration. Today, Jhum stands for cultivation in hill slopes by use of hoe (Darlong 2004).

Traditionally, the tribal people in the Northeast practiced Jhum (shifting cultivation) in the hill slopes as an important means of livelihood system. Jhuming is the main occupation of all the tribe of north-east India as they are having relatively low density of population and long Jhum cycles which help the farmers to manage their livelihood with sustainable way (Behera & Nayak 2013). Shifting Cultivation is a part and parcel of socio cultural life of the tribal in North East India. All its operations are inseparably linked with their religious rites and festival. In spite of its adverse effects on the ecosystem and low productivity, it still continues as a necessary evil (Mawthoh, 1976). The rationale behind the persistency of this system lies in its compatibility with the physical-social environment of sparse population, community land tenure system, undulating and slope topography, short crop cycle, rainy season and thereafter, acute moisture shortage during monsoon period. Despite all the shortcomings, jhuming cannot be stopped completely as the lifestyle and cultural ethos of the tribal people is closely governed by jhuming operations (Majid, 1993; Zabid (1993).

Tiwari (2005) has identified four categories of Jhum, which are prevalent in North-Eastern Hill Region. The first is traditional Jhum practiced in the interior areas like Nokrek Biosphere Reserve, Garo Hills, Meghalaya, and in Nongching village of Nagaland where human population has not increased much. Traditional Jhuming helps

conserve forests as the land is rotated in land use between a long fallow periods followed by a short cropping phase. It has survived the test of time for thousands of years. The second is Distorted Jhum which is neither productive nor sustainable where the fallow period has reduced to 1-3 years. This type of Jhuming can be found in many parts of Mizoram, Arunachal Pradesh, Manipur hills and in the West Khasi Hills of Meghalaya. The third is Improvised Jhum which is recently adapted cultivation of cash crops in Jhum fields, the farmer practice unusually long cropping phase, unique weeding system with almost no fallow period. It is mainly found in Nagaland and Meghalaya. The fourth is Modified Jhum which mainly focuses on incorporating tree husbandry and cash cropping in Jhum. Two externally funded development projects were implemented, viz., NEPED-ICEF in Nagaland and NERCORMP in Meghalaya, Manipur, and hill districts of Assam with a goal of improving Jhum.

1.2. Shifting Cultivation in Mizoram

Mizos have been agriculturists from the beginning of the 18th century when they made their western trek to the present Mizo hills. They know only the form of farming known as shifting cultivation which forms the major activity of the Mizo economic life even today. Wet rice cultivation is reported to be first practiced in the year 1921 by the Mizo residents of Burma which marked the recorded adoption of a new technology in the culture of rice farming among the ethnic group of Mizo (Thangchungnunga, 1997; Goswami, 1980).

Jhuming locally known as ‘Tlangramloneih’ is the only occupation and has a close link to their culture and tradition. It is the way of life and almost all the activities of the Mizos revolve around it. This can be seen from the very fact that the three main festivals of the Mizos such as Chapchar Kut, Mim kut and Pawl kut are closely related with Jhum

operations. Majumdar (1976) observed that the importance of traditional rites and festival is decreasing along with the decline of shifting cultivation in Garo community.

- a) Chapchar Kut: The word 'Chapchar' is a combination of two mizo words 'Chap' meaning the felled trees and vegetation which are left to get dry and 'Char' means dry. Therefore, 'Chapchar Kut' is a festival celebrated sometimes in the month of March after the completion of their arduous work that is the task of jungle clearing and while waiting for the felled trees and vegetation to dry. It is celebrated with enthusiasm and performs a dance.
- b) Mim Kut: This festival is a festival of Maize usually observed during the month of August and September after the harvest of maize with 'Zu' which is a locally made rice beer. This festival is mainly celebrated in memory of the dead where the some of the harvest from the field are consecrated to them.
- c) Pawl Kut: 'Pawl Kut' is a festival of harvest celebrated during December and January after a paddy harvest. This festival is meant for the children and perhaps the greatest festival of the Mizos. Since it is a time for enjoyment as the products from the field are harvested it is celebrated with special food and no one is allowed to engage in sort of argument.

Beside these festivals some of the rituals also linked to Jhum such as:

- a) Kawngpui siam: This ritual is usually done in the beginning of the year to ensure that the villagers will be successful and lucky in their cultivation and hunting activities. All the villagers attend the ritual and are usually performed outside the village in the road site offering pig.
- b) Fano Dawi: This ritual is mainly performed in the month of June and a black cock is sacrificed by the Priest. This ritual is performed to ensure that the crops are protected and also to prevent them from too many mosquitoes in the field.

As per the 2011 census, out of the total population of Mizoram 55.76% of the total workers are engaged in agricultural activities. More than 60% of the population depends upon agriculture and allied sector. Share of Agriculture and Allied sector to the economy during the 11th Plan period could be averaged at 14 %. About 32 % of the cultivated area is under Jhum cultivation. Only 31.60 % of the demand for rice could be met within the State. During 2012-13, a total of 1,70,931.80 tons of rice was lifted by the State Government from outside. The existing area under various horticulture crops accounts for 1.21 lakhs hectare which is only about 10.46% of the estimated potential area of 11.56 lakhs hectare. The Gross Domestic Product under Agriculture sector contribute the highest in Mizoram industry (Rs 1,51,960 lakhs) accounting 18.17% of the total state Gross Domestic Product which is Rs 8,36,292 lakhs (GOM, 2014:7).

In Mizoram, the livelihood base of majority of the population is cultivation especially shifting cultivation. Out of 2,22,853 households in Mizoram, the jhum cultivators comprise of 58,751 household (26.36%) and households practicing wet rice cultivation are 12,314 households (5.52%) (ESM 2015 & BSNEI 2015). A predominant majority of the populations are depending on cultivation for their livelihood all over the districts of Mizoram. The total number of working population in Mizoram is 4,86,705 persons where cultivators constitute 47.17% and agricultural labourer constitute 8.58%. Aizawl District has the highest working population with 1,74,636 persons where the number of cultivators is the lowest with 39,266 (22.48%) and agricultural labour is 11,434 (6.54%) which may be a result of urbanization. Lunglei District has 78,292 working population and have the highest growth in number of cultivator as compared to 2001 census which constitute 45,439 (58.03%) and 13.61% agricultural labourer out of the total working population. Champhai District has 60,342 working population with 63.53% cultivators and 9.64% agricultural labour. Lawngtlai District has 45,566 working

population with 64.4% cultivators and 12.77% agricultural labour. Mamit District has 39,339 working population with 72.87% cultivators and 6.48% agricultural labour. Kolasib District has 36,672 working population with 49.06% cultivators and 16.14% agricultural labour. Serchhip District has 32,397 working population with 67.3% cultivators and 3.96% agricultural labour. Saiha District has 19461 working population with 45.77% cultivators and 4.91% agricultural labour (BSNER 2015).

Wet rice is grown in the lowlands and the valleys. The area under jhum cultivation has declined from 24,706 hectare during 2012-13 to 22,633 hectares during 2013-2014 which account for about 8.40% reduction. The reduction in jhum cultivation area is mainly due to the implementation of New Land Use Programme (NLUP), RKVY, Oil Palm Development Programme and Sugarcane Cultivation Programme. The marginal increase in WRC Area has been recorded from 14,330 hectare during 2012-13 to 15,620 hectare during 2013-14 which accounts for 9% increase (MES 2015:41). The share of shifting cultivation in net sown area was calculated about 24706 hectare which constitute 47.24 % during 2012-2013 but it has gone down to 22633 hectare which is only 43.28% in 2013-2014 (GOM 2015). Due to the increase in population the fallow period which is Jhum cycle under shifting cultivation has been decreased from 20-25 years to 2-3 years recently which becomes more intensive and frequent. This has put excessive burden on the land and soil fertility has been reduced. As a result, the production and per ha yields of cereal crops and vegetables have been decreased considerably (Sati and Rinawma 2014).

In Mizoram, the economic life of the people has always been centered around shifting cultivation. It is their way of life. The crops grown are mixed while the principal crop is paddy. Other crops are maize, cucumber, beans, arum, ginger mustard, sesame and cotton. Some pulses like cowpea, rice beans and French beans are cultivated under

shifting cultivation. As regards the agrarian structure of Mizoram, nearly majority of the cultivators constituting 48.8% are marginal farmers owning less than one hectare of land. 34.64% belong to small farmer owning 1 to 2 hectare, 15.32% belongs to Semi medium owning 2 to 4 hectare, 1.6% belongs to Medium owning 4 to 9 hectare and 0.04% belongs to large farmers owning 10 hectare and above. The mean size of land holding was worked out to 1.8 hectares (AISM 2007).

1.3. Overview of Literature

Agrarian structure and change have been the fertile areas of social science research in India as inequalities in it is perceived as a major cause for agricultural backwardness in the country. Economists, sociologists and historians have conducted a number of studies on these aspects of social structure in different regions of the country (see Athreya et al. 1990; Harris, 1982; Mukerjee, 1969; Shah, 1969; Gadgil, 1969; Thorner, 1969; Joshi 1969). Some of these studies probe into the changes in the agrarian structure and its impact on rural development (see Harris, 1992; GOI, 1954; Gupta, 1969; Shah et. al. 2009; Adamopoulos 2011; Joshi 1969; Ghosh 1998;). There are some studies which focus on the agrarian reforms (see Jacobs 2013; Moyo 2011; Spoor 2012; Hoyweghen 1999; Tuma 1963; Swinnen 1997; Tawnenga & Uma Shankar 1995; Thiesenhusen 1974; Thorner, 1969a; Joshi, 1969; Kushro, 1960; Jefferies 1971; Fernandes 2009) and modern agricultural technology (see Adam 2013; Alene 2010; Roy 2007; Batterbury 2007; Lenegran 2007; Panda 2006; Seidenberg 2003; Vyas 2002; Thangchungnunga 1997; Zabid 1993; Bras, 1990; Basant, 1987; Byres, 1981; Borthakur, Awasthi & Ghosh 1976) and their impact on the agrarian structure as well as rural living conditions.

As agriculture is the main source of livelihood for most of the tribes, there are a number of studies on tribal agriculture in India. In this area, studies have concentrated on

the agrarian structure, change as well as crucial agrarian issues of shifting cultivation (see Jacobs 2013; Ferguson 2013; O’laughlin et. al. 2013; Conclin, 1961), and land alienation (see Rath 2005; Shanmugam, 2004; Saravanan, 2002; Karuppaiyan, 1998).

On shifting cultivation there is copious literature in India as many tribes depend upon that for their sustenance. The studies generally focus on social and economic aspects shifting cultivation in different regional contexts viz., as jhum cycle (See Ickowitz, 2004; Jha 1997; Masjit 1993; Zabid 1993; Datta 1992; Agarwal 1985; Patnaik 1982; Goswami 1980; Saha 1976), ecological consequences (See Northe et. al. 2014; Temudo & Abrantes 2013; Gonzales 2012; Zamchia 2011; Zaitinvawra & Kanagaraj 2008; Kishore 2004; Raman, Rawat and Johnsingh, 1998; Snyder 1996; Masjit 1993; Zabid 1993; Bose, Ghatak & Bera 1982), cropping pattern (see Nongkynrih 2014; Lalengzama & Kanagaraj 2013; Ajami 2005; Zaitinvawra & Kanagaraj 2008; Ickowitz, 2004; Raj 2003; Borthakur 2002; Jha 1997; Chatterjee 1993; Hungyo 1982; Patnaik 1982; Wadia 1980; Agarwal 1985; Morab 1982; Bose 1976; Saha 1976), input use (see Kannan 2015; Arslan et. al. 2015; Jerven 2014; Adam 2013; Cousins 2013; Das 2013; Moyo 2011; Keyder and Yena 2011; Zaitinvawra & Kanagaraj 2008; Hansen 2008; Batterbury 2007; Schweizer 2006; Panda 2006; Haroon & Chauhan 2012; Ickowitz 2004; Seidenberg 2003; Sachidananda, 1989; Khan 1983; Saha 1976; Agarwal 1985; Wadia 1980; Thiesenhusen 1974), willingness to switchover to settled agriculture (Zaitinvawra and Kanagaraj, 2008) etc.

There are also studies on the tribal development especially the living conditions and the livelihood of the tribal people which focus on the socio economic condition of tribal in areas (see Temudo & Abrantes 2013; Ajami 2005; Ramachandran, 1992; Rajarathnam and Guruswami, 1987; Karupaiyan, 1990; Manivannan, 1989). Some have attempted to study inter tribal variations in tribal development (see Kanagaraj, 2014; Lalengzama & Kanagaraj 2013; Lalengzama 2011; Zaitinvawra and Kanagaraj 2008).

1.4 Statement of the Problem

This study focuses on the bearing of change in agrarian structure i.e., switch over from shifting cultivation to settled agriculture on tribal development in Mizoram from a social policy and social work perspective. Agrarian structure is probed in terms of the nature of land ownership, distribution of land across size of land holding. Further, the changing patterns of cropping, tools and implement use and input use are also studied. Tribal development is assessed in terms of the livelihood and living conditions of the households. The study tries to assess the perception of cultivators on the ecological consequences of shifting cultivation as well as understand the role of jhum control programmes including the ongoing New Land Use Policy (NLUP) of the Government of Mizoram in the agrarian transformation from the perspective of the farmers. Finally, the study explores the social dynamics of agrarian transformation to settled agriculture from the lived experiences of the settled cultivators.

1.5 Objectives

The following are the objectives of the present study.

1. To assess the differential patterns of agrarian structure in the tribal areas from an etic perspective.
2. To study the perception of the cultivators on the ecological consequences of shifting cultivation.
3. To assess the ex-post impact of switch over from shifting cultivation to settled agriculture on the livelihood and living conditions of tribal households.
4. To assess the perceptions of farmers on the ongoing New Land Use Policy (NLUP) of Government of Mizoram.

5. To understand the social dynamics of agrarian transformation in Mizoram from an emic perspective.
6. To suggest appropriate measures for socio economic policy and social work intervention to promote sustainable tribal livelihood in Mizoram.

1.6 Hypotheses

The focus of the present study will be the following hypotheses.

1. The size of land holding is higher among settled cultivator households as compared to shifting cultivator households.
2. The cropping pattern of shifting cultivators is more diversified as compared to settled cultivators.
3. The volume of livelihood assets of settled cultivator households are greater than those of shifting cultivator households.
4. The levels of living conditions of the settled cultivator households are greater than those of shifting cultivator households.
5. The household income of the settled cultivator households is more diversified as compared to that of shifting cultivator households.

These hypotheses provide focus by pointing out the nature of agrarian transformation and its impact on development of tribal households. In fact, the first two hypotheses originate from the study by Zaitinvawra and Kanagaraj (2008). These two hypotheses were confirmed by the study by Lalenzama and Kanagaraj (2011). The other three hypotheses originate from the study by Lalenzama and Kanagaraj (2011).

1.7 Chapter Scheme

The present study is organised into the following nine chapter viz., introduction, review of literature, field settings and methodology, structural bases of cultivators, agrarian structure and transformation, tribal development: livelihood and living conditions, challenges in agriculture and New Land Use Policy, Dynamics of Agrarian Transformation and development, and Conclusion.

The first chapter presents the introduction. It is concerned with the overview of Jhum cultivation and highlights the status of jhum cultivator in North East India and Mizoram state. The chapter also deals with the over view of literature. The objectives, statement of the problem and hypothesis of the study are also included in the present chapter.

The second chapter presents a review of literature. The review of literature is organised into three main sections. The first section contains review of studies on Jhum cultivation. The second section contains studies on Agrarian Change and the third on Tribal Development. Most of the literatures are articles from different journal and books.

The third chapter describes the field setting and the methodological aspects of the present study. It describes the profile of the study area in terms of Mizoram state, Lunglei district and the four sample villages viz., Lungsen, Tawipui South, Leite, and Muallianpui. Moreover New Land Use Policy of the Government of Mizoram is also highlighted in the present chapter. The present chapter also contains the research design including sampling method, tools for data collection and method for data processing and analysis is also highlighted. Besides these, the Concept and operational definitions and the Research limitations were also contained in this chapter.

The fourth chapter contains the Social Structural Bases of Cultivators which are further presented in four major sections viz., demographic structural bases, familial structural bases, social structural characteristics and economic structural bases.

The fifth chapter contains Agrarian Structure and Transformation. Agrarian Structure and Transformation is further presented into sub sections viz., Nature of land possession, Pattern of land possession, Ownership of livestock, Cropping pattern, Tools used in cultivation, Input use and Perception on ecological consequences of shifting cultivation.

The sixth chapter contains Tribal Development: Livelihood and living conditions. Agrarian Structure and Transformation is further presented into sub sections viz., Pattern of tribal livelihood, Patterns of Living Conditions, Patterns of Relationship between Livelihood and Living Conditions, Patterns of Relationship between Agrarian Transformation and Tribal Development.

The seventh chapter highlights the Challenges faced in agriculture and how the New Land Use Policy helps the farmer to cope with the existing problems. The challenges faced by the farmers are classified as Lack of agro based industries, Lack of storage facilities, Inadequate availability of organic manure, Inadequate supply of chemical fertilizer, Inadequate supply of chemical pesticide, Inadequate electricity supply, Inadequate funds, Poor roads, Lack of transport services, Non remunerative price, Inadequate animal labour, Lack of marketing facilities, Lack of Irrigation facilities or sources, Non suitability of land for cultivation, Lack of Information on Market, Lack of technical knowhow to practice and Inadequate human labour. These problems are rated as four point scales with certain perception such as Always, Mostly, Sometimes and Never. The NLUP is presented with certain subsections such as beneficiaries, name of trade, year

of receiving, nature of assistance, ways of utilisation, reason of not receiving and impact NLUP.

The Eighth chapter is social dynamics of agrarian transformation and development which contains the Case Studies conducted during the field work. Six cases were studied and the unit of studies was selected from villages that use farming as a primary occupation.

In the ninth and final chapter, a conclusion of the present study is drawn and highlighted with a series of suggestions. The Policy implication is presented in the form of suggestions in relation to agrarian change and tribal development in Mizoram.

CHAPTER II

REVIEW OF LITERATURE

Review of literature helps a researcher to understand the theoretical and empirical dimensions of a research problem. It also helps in identifying the substantive, theoretical, methodological, conceptual and operational issues concerned with the research problem.

This chapter attempts to present the review of literature on shifting cultivation, agrarian change and tribal development. This chapter has been presented into two major sections viz., studies on shifting cultivation and studies on agrarian change and tribal development.

2.1 Studies on Shifting Cultivation

Sati and Rinawma (2014) review the practices of shifting cultivation and its implications in Mizoram. Agriculture is the main occupation of the people. This study mainly focuses on the secondary data and review of existing research. Field observation of shifting cultivation areas of Aizawl and Mamit districts also assist in the interpretation of data. Shifting cultivation is mainly practiced in the highlands and lowlands and valleys are characterized by sedentary form of wet rice cultivation. They hold that shifting cultivation has negative impact on the environment although it is the main socio-economic activity of the tribal people. Further, the shifting cultivation areas have also been reduced to 58.1% from 1997-98 to 2010-11. As a result, forestland has increased by 1.40 in Mizoram, between 1991 and 2011.

Das and Das (2014) studied the status of shifting cultivation review the works done on various alternative farming systems in the state of Tripura. They highlighted the perception of tribal people on jhum cultivation and reasons for continuing the practice although the government has banned this practice long ago. They also assessed the impact of jhum cultivation on different aspects of natural and human environment. They focused

on coping with the negative and positive aspects of shifting cultivation and illustrated the other possible alternatives that may be acceptable to the Tribal people of Tripura. According to them the tribal population of hilly Tripura continue to depend on shifting cultivation for their subsistence livelihood due the factors such as lack of settled agricultural field, irrigation facilities, remoteness, high cost of labour and energy inputs involved in terrace cultivation, and absence of other viable alternatives to shifting cultivation. Yet the authors feel that if the jhum cultivation continues in its present form then land degradation, ecological balance, deforestation, soil loss and fertility, destabilization of slopes may happen and the impoverished living conditions of resource poor upland farmers are bound to worsen with time.

Niranjan Saha (1976) analysed the process of jhuming, jhum cycle and levels of production, cropping patterns, inputs of labour, productivity and return under jhuming in North East India. As the level of income appears to be very low, he suggested for the replacement of the system by suitable alternative occupations like settled farming, horticulture, dairy and poultry farming, small scale industry etc.

D. N. Borthakur, R.P.Awasthi and S.P. Ghosh (1976) analysed the harmful effects of shifting cultivation in North East Region. According to them the basic approach to solve the problems includes steps for increasing productivity of jhum land, as well as short term and long term measures. They suggested horticulture crops as alternative system for shifting cultivation and two-stage plan i.e., short term till the permanent settlement of jhumias and long term permanent settlement. They also suggested animal husbandry including fisheries and poultry farming as sources of subsidiary income. According to them with the production technology in land and sound research base, demonstration, training and extension efforts, the gloomy picture of agriculture of North East Region could be change.

S. Biswas and A.K. Ghosh (1976) examined the effects of shifting cultivation on wildlife, depletion of forest resources changes in the ecosystem and destruction of virgin forest in Meghalaya. They observed that there is a need of interdisciplinary approach, flexibility of thought and improvement of the relationship between man and the environment as important to deal with the problem of shifting cultivation.

Saradindu Bose (1976) studied the nature and extent of shifting cultivation with a case study of Juang tribe in one village of Orissa. He described the demographic profile of the population, land use pattern, loan pattern and cropping pattern. He observed that there is a tendency among the Juangs to concentrate their agricultural activity more on the plains of the valley bottom and prefer wet cultivation. He also suggested measures to control shifting cultivation.

A. K. Agarwal (1980) described the process and jhum cycle, cropping pattern, extent, and observes views about jhuming in North East India. He also dealt with the produces and effects of Shifting Cultivation, the scope of settlement of jhumias in the region and programme for improvement on jhuming for high production and Permanent Settlement was also analysed. He observed that the alternative system of farming to replace jhuming to permanent cultivation should be in a planned manner with the policy of persuasion, demonstration and fundamental research of applied nature to win the confidence of jhumias.

N. Patnaik (1982) described the techniques and methods of shifting cultivation, area under shifting cultivation agricultural opportunities of terraced cultivation, cropping pattern, jhum cycle economics of shifting cultivation of Soaras of Ganjam district, Orissa. He observed the devastating effects of shifting cultivation and recommended that in spite of the people's resistance to switch over from jhuming to terrace cultivation people may

be approached and persuaded to stop practising shifting cultivation and cultivation of hill tops should be banned forth with.

Pearson Hungyo (1982) discussed the land tenure, the process of jhuming, jhum cycle, and cropping pattern, reasons for persistence of shifting cultivation etc. in Nagaland. He observed that people realise the necessity of leaving the old method of slash and burn cultivation in future to cope with the problems of population increase. He also observed that marketing facilities and roads and communication are not properly available in this area.

Saradendu Bose, S. Ghatak and R. K. Bera (1982) analysed ecological background of the regions under shifting cultivation, regional variation of land use practices, jhum cycle, cropping pattern, rainfall, density of population in North East. Even though shifting cultivation is accepted as a primitive system of land use by which soil fertility degenerates, he observed that it is not always destructive and it had its own merits too. He suggested that the region should be studied thoroughly from an insider's view through case studies among all communities to quantify the nature of the regional problems and based on that local remedies solution for evolving practical recommendation could be work out.

A. K. Agarwal (1985) described the process of Jhum Cultivation in North East Region, jhum cycle, cropping pattern, inputs of labour and productivity from a development perspective. He stressed the adverse effects of jhuming mainly that of soil erosion. He suggested alternative farming systems, animal husbandry and settled cultivation for rapid economic development of the region.

S. P. Shukla and A. K. Agarwal (1986) observed jhuming as a system indigenous form of agriculture. They analysed the process, jhum cycle, consequences of jhuming and the role of NEC in the settlement of jhumias. According to them making the jhuming

enlightened about the balance of equation and of accepting the best part of jhuming instead of condemning it.

Sachchidananda (1989) discussed the geographical spread, typology, demographic distribution, ethnic composition of shifting cultivators, and reviewed of government policies and programmes related to shifting cultivation. He also probed into the people's perception and attitude towards shifting cultivation. He made a plea for reviewing shifting cultivation not only as an economic activity but also in its specific historical and socio-political contents, and advocates improvement in its methodology so that its yield is increased and damage to the environment minimised. He felt the need for continuing jhum cultivation not only for emotional and socio-cultural considerations but also for the best economic opportunities it has in certain relatively remote and sparsely populated pockets.

Goswami (1968) held that jhuming can no longer provide sufficient food even at subsistence level despite the fact that as much area as a family can handle could be taken up for Jhuming. Because the circumstances have removed the only device through which Jhum yield was maintained previously a very long period of rest for 40 years or so. He also indicated that Jhuming by exposing the hill slope for erosion was the main cause of sedimentation of river beds and recurring floods year after in the plains of Assam have brought in untold misery to plain areas for no fault of theirs.

K. N. Ninan (1992) analyses the economics of shifting cultivation vis-à-vis settled cultivation in north east India, with the help of micro-level data and information available in the studies conducted by some agro- economic research centres. He also analysed productivity of crops and returns from crops under jhum and terrace cultivation. He observed that settled (terrace) cultivation is not as remunerative as shifting cultivation. He suggested that the strategy for hill area development in India which has hitherto focused

on the narrow issue of drifting versus settled cultivation should shift its emphasis to the larger and more relevant issue of diversification of economic activities in the hill regions, which holds the key to the future and economic prosperity of hill and tribal regions.

P. S. Datta (1992) studied the area under jhum in North East India, Jhum Cycle, number of families practising Shifting Cultivation. He asserted that the most remarkable feature of shifting cultivation is almost all varieties of cereal and vegetable are grown in one jhum field which is rather impossible to have in wet plain land. He observed difficulties in replacement to jhuming with terraces in certain regions with loose soil, its expensiveness and maintenance in rainy season. He suggested a re-orientation of analysis of shifting cultivation from deploring the practice as right and left of technological and scientific knowledge towards making the system more productive.

Husain Majid (1993) examined the jhuming scenario with a focus on the agricultural operations, rotation of crops, jhum cycle and the ecological consequence of the existing utilisation of soil and forest resources in Nagaland. He was of the view that primitive technique of land utilisation in jhuming leads to many ecological crises and creates many socio-economic problems. Despite all the shortcomings, he observed that jhuming cannot be stopped completely as the lifestyle and cultural ethos of the tribal people of Nagaland is closely governed by jhuming operations. While introducing any innovation in jhuming, he suggested that it must be born in mind that the suggested changes and prepared policies should be socially acceptable, economically viable and environmentally sustainable.

Husain Zabid (1993) analysed the place and role of Shifting Cultivation in eco-development and whether it is a stumbling-block or not in N.E. India observed that Shifting Cultivation is not a stumbling block in the development of ecosystem of North Eastern India provided it is practised on limited area with long jhum cycle. He is of the

view that since Shifting Cultivation is a means of subsistent it cannot be given up rapidly. He suggested that the existing optimum laid of resource utilization under jhuming has to be reset at higher level but without disturbing the ecological balance and the future technology must be ensured to the traditional people and local environment to ensure on overall eco-development.

S. N. Chatterjee (1993) talked about three types of jhumias in Tripura viz, pure jhumias, jhumias by choice, and incipient sedentary farmers, the operation of jhuming, cropping patterns and the effects of jhuming in Tripura. He observed that jhum Cultivation has deeper roots in the socio-economic life of different tribes and hence no common scheme is suitable for dealing with the problem. He suggested that based on agro-climatic Conditions, culture and behavioural pattern a mix activity such as terracing plantation, forestry etc. should be advocated.

Malabika Das Gupta (1994) studied number of jhumias, viability of jhuming, characteristics of jhuming and jhum control and jhummia rehabilitation schemes in Tripura. According to her the relief for rehabilitating Jhumias have mainly concentrated on giving them ownership rights over land for practising settled cultivation or growing cash crops. She felt that this policy might create new vested interest among the jhumias by developing a new set of land relations among them.

William E. Hyde et. al. (1996) said that traditional populations use the forest without destroying it. These populations have a deep understanding of the importance of nature to their society. Generally, traditional populations have survived by taking their food from the forest and by using the forest in a way such that there was no threat to the balance between entropic actions and nature. They lived by hunting, fishing and extracting (gathering) from the forest. Growing populations, increasing food consumption, and government policies that encourage agriculture all generate increasing

demands for commercial agricultural land. They also push populations of shifting cultivators farther into the forested interior, where soils are often thinner and the shifting cultivators must either move and clear the forest more frequently or manage an increasingly degraded environment.

L. K. Jha (1997) provided a comprehensive account of socio-economic and bio-physical problem associated with shifting cultivation in India particularly in North East India. He discussed jhum cycle, cropping pattern, productivity effects, rites and rituals associated with shifting cultivation. He also described the socio-culture profiles and land development schemes to rehabilitate jhum farmers. He suggested measures to minimise shifting cultivation. He observed that allotment of permanent land and demonstration of alternative models to the jhum farmers is necessary to minimize the practice of jhum cultivation.

Mertz et. al. (1999) viewed that the system certainly alters forest composition, but not as radically as agricultural land development, which leads to conversion of forest to permanent fields. Moreover, shifting cultivation is changing rapidly in many areas, partly because of population pressure and partly because livelihood strategies are diversified to include permanent cultivation of cash crops and off-farm work. The result is often a reduction in fallow periods rather than expansion into new areas of primary forest because villages are generally permanent whether by choice or force and distant areas are unattractive for farming.

P. N. Singh, Pramod Kumar, and D. N. Verma (2000) analysed the effect of Shifting Cultivation, effort on jhum control and agro-based industries as an alternative to Shifting Cultivation. They observed that Shifting Cultivation is no more profitable and suggested the suitability of effective development of agro-based industries such as

Industries based on essential oils and medicinal plant and Fruit based industries for curbing the traditional Shifting Cultivation practices in North Eastern Hill Region.

A. K. Sinha, B. G. Beweryee and R. N. Vashisht (2004) discussed the origin, and essential pattern of shifting cultivation in North East India, regions and populations depending on it and reasons for continuing shifting cultivation. They observed that studies from some of the villages in North East India do not reveal any distinct advantage of settled cultivation over jhum cultivation in terms of their economic return. They are of the view that finding alternative blue print for tackling the problem of shifting cultivation is difficult.

D. N. Borthakur (2002) discussed the method followed in Shifting Cultivation, cropping pattern, jhum cycle and attempts of jhum control in North East India. He also analysed research on jhumming and course out with two approaches - Improvement Approach and Replacement Approach. He observed that it is not possible to do away with jhumming in one stroke as it is very deeply rooted among the people who practiced it. He suggests that research must be strengthened and geared up to find solution to meet all the Environment of the multifaceted problems of Shifting Cultivation. He observed that the most important entry point to achieve success in involving farmers and executing the alternative farming systems are awareness, irrigation and market.

Mertz (2002) in a study mentioned that yield levels in shifting cultivation are influenced by a wide range of biophysical, socioeconomic, and cultural factors. Several studies found no relationship between fallow length and yield, but these also lack information to verify the validity of the data. It is concluded that empirical studies focusing on this problem are needed to fully understand this relationship and develop feasible scenarios for the numerous attempts at modelling shifting cultivation development and it is difficult to isolate fallow length as a single determining factor.

Rethinking the relationship between length of fallow and crop yields in shifting cultivation, he questioned the theory that a correlation between shortened fallow periods and yield decline in shifting cultivation exists. This relationship has been taken for granted, and because it shows that shifting cultivation will break down under pressure, it has partly been responsible for negative government views on shifting cultivation.

Seidenberg et. al. (2003) surveying with a remote sensing based analysis of forest cover during the period 1989-1999 in three villages in northern Lao PDR, analyzed changes in shifting cultivation practices and livelihood strategies and the impact of these on deforestation. Shifting cultivation is often blamed for deforestation in tropical upland areas. They found out that shifting cultivation causes temporary deforestation during the cropping period, but allows for re-growth of secondary forest. Secondary vegetation exists in many different stages in shifting cultivation areas, and while lacking the conservation and carbon storage value of mature forest, it usually provides better ecosystem services than permanent farming. A reasonable measure of deforestation processes in a shifting cultivation area is therefore the increase in aggregate areas under annual cultivation.

Suguna Pathy (2003) argued that shifting cultivation is not solely responsible for deforestation, but the inherent structural factors are instead. Precisely, as forest resources can be managed with the people's involvement towards balanced utilization, subsistence and survival. Forest is the main source of food, shelter, culture and tribal corporate ethos. Besides it is a resource system for survival where the market economy fails. Several studies reveal that tribal people are slowly losing control and command of their traditional rights over the natural resources.

Ickowitz (2004) held that a major consequence of declining fallow lengths is said to be deforestation. The idea is that when the fallow length becomes too short, the soil can

no longer regenerate adequate fertility to support forest vegetation. While few of the reviewed studies provide data to show that fallow lengths have in fact declined anywhere, none provides evidence to show an overall decline in fallow lengths in tropical Africa. Farmers have continued to practice shifting cultivation and according to many, the practice has become more destructive (through the declining fallow lengths) so it would seem logical that there would be a steady, if not dramatic, change of forest into savanna. He also argued that the extent of deforestation in West Africa has been greatly exaggerated. They use historical data, accounts from current inhabitants, aerial photographs, and satellite images to show that deforestation in West Africa is only about a third of what has been estimated and cited by most agencies.

Tawnenga and Uma Shankar (1995) made studies on as slashing and burning of vegetation, cropping period, and intervening fallow period between first and second year cropping. They concluded that even if jhum cultivation is not a sustainable option due mainly to shortening of jhum cycle, it cannot be brought to end abruptly. It is mainly because jhum provides employment, livelihood and food to millions of people in India, especially tribal societies. They suggested that jhum should be modified gradually step by step to make it environmentally sustainable.

C.Vanlalruati (2015) in her studies of the land and forest of the Mizo pre-colonial society state that the Mizo held the land important as their dependence and connection with the forest is still very high. The land was considered to be owned by the chief but the population has communal rights over the forest and the resources. The chief levy taxes on his subject in kinds as a symbol of political authority. The chief has supreme authority over land distribution. The livelihood and survival of culture and religion depends on forest and land.

Eleanor and Fuller (2012) consider alternative perspectives on the long term history of shifting cultivation in India and Sri Lanka. According to them shifting cultivation persists in hill regions which are more marginal for sedentary, high intensity agriculture and state procurement of taxation. The first permanent settlements appeared and became increasingly prevalent from 1800 to 1600 BC. Two cropping seasons became well established, and fixed field systems are inferred. It is also possible that emerging social hierarchies and the demands of emergent chiefs promoted an alternative political strategy of more egalitarian, hill dwelling shifting cultivators. It was in this context that fruit trees were trans-located, leading to the development of arboriculture within the lowland plains and the domestication of certain fruits, such as citron, mango and jackfruit.

Nongkynrih (2014) study the complex system of land tenure and land ownership in Meghalaya involving two authorities which are the traditional and non-traditional institutions. The traditional institutions functions on the basis of local customary laws and traditions which have not yet been codified and are based on customs and conventions practiced by the people from time immemorial. The paper finds that most of the people still prefer customary laws (under the guidance and authority of the traditional institutions) to continue, citing preservation of the indigenous culture and heritage as the primary reason. On the other hand, visible changes in land use has been observed, wherein people are going in for commercial farming with the jhum cultivation being replaced with settled cultivation. It was noted that during the past no transfer has ever taken place towards non-tribal in the study villages. Transfer of land has largely remained localized, wherein land transactions including its sale, purchase or leased, has only occurred among the tribes of the state. A growing population and the resultant need for housing requires that agricultural land is now traded for housing units with the only difference being that city dwellers would go in for purchase of land from the village folks.

There are evidences of the increasing dependence on commercial or cash crops in agriculture for the reason of increasing monetary benefits with the traditional single cropping pattern being substituted by multiple cropping.

Temudo & Silva (2012) in their study on the impact of war and of post war reconstruction efforts on agriculture and forest cover change, examining the relationship between agricultural practices and forest cover change, after the end of the civil war, in two districts of the Niassa province, in Mozambique concludes that shifting cultivation in Africa is complex, that change may occur in many directions and at different rates simultaneously and that tropical deforestation is best explained by multiple causes and driving forces rather than by single factor causation. Furthermore, it reveals the advantage of combining remote sensing with ethno-agronomic data in the study of land use or cover changes.

Leblhuber, Kimi and Vanlalhrauaia (2012) studied Jhum cultivation and Jhum control programme in Mizoram. They highlighted the current debates surrounding jhum cultivation, forest conservation, and agrarian change in Mizoram by looking at jhum cultivation in relation to the New Land Use Policy (NLUP) introduced by the government of Mizoram since 1984. They concluded that NLUP disturbed a well organized system of jhum cultivation where the community's role in the management of the environment is reduced while increasing government's role. NLUP is a high cost programme promoted in Mizoram on the basis that it will improve rural livelihoods. However, the authors argued that the intention of the government is to follow liberal economic policies rather than improving the lives of rural populations where the goals of the NLUP contradict themselves. The NLUP is used as an experiment for the past several years, but there is tremendous cause for concern that the failure of the project would seriously erode the credibility of the government.

B. N. Bordoloi (1976) analysed the demographic profile of shifting cultivators in North East India with special reference to the hill areas of Assam. He also analysed the schemes for rehabilitation of shifting cultivators based on Model village, cash crop Plantation scheme, scheme for composite projects and scheme for agriculture, Concentrating centres. He observed that the successful implementation of the schemes depends on earnest zeal, un-exhausted patience and with follow up programmes.

D. N. Majumdar (1977) examined the relationship between shifting cultivation and permanent of terrace cultivation. He emphasised on villagers views regarding terrace cultivation among three villages in Garo Hills District of Meghalaya. He observed that Shifting Cultivation is still regarded by the villagers as a sure method of producing food crops and the attempt to introduce terrace cultivation in Garo Hills will succeed in those areas only and among those individuals only where economic condition have become such that terrace cultivation has remained the only untapped source of income.

D. J. Roy et. al. (1976) analysed the problem of jhuming, function of jhum control and co-operative approach. He suggested that there is a bright scope of expansion of jhum areas for cultivation through maintenance of livestock for direct and indirect source of income.

B. B. Dutta (1976) analysed three different types of shifting cultivation control schemes in North Eastern India and the involvement of different departments in the scheme. He observed that lack of credit facilities allotment of infertile land, non-utilization of subsidy money and lack of proper coordination among different departments for the task of setting the shifting cultivators on land for permanent cultivation are the most different problem in the implementation of the schemes.

D. C. Das (1976) discussed the problems of jhuming like soil degradation and sedimentation. He suggested an integrated approach in land use management, which

include watershed approach; mixed land use, water management and comprising of agro-horticulture programmes and livestock keeping. He observed that the need for permanent and stabilised land use as inescapable in North Eastern India.

D. N. Majumdar (1976) analysed the linkage between Garo culture and shifting cultivation in terms of religious rites, rituals and festivals. He also analysed the problem relating to acceptance of plough cultivation. He observed that the importance of traditional rites and festival is decreasing along with the decline of shifting cultivation.

P. R. Mawthoh (1976) analysed the demographic profile of Meghalaya and the significant feature and evils of jhuming. He suggested that terracing, banding, trenching, check damming, gully plugging etc, be adopted according to the need of the areas as an alternative of jhuming.

S. K. Mukherjee (1976) discussed the area utilised and number of tribal people dependent on Shifting Cultivation. He also discussed the evil effects of jhuming, the problems of replacing jhum, socio-economic conditions of jhuming areas and alternative to jhuming in North East India. He suggested that the best way is to evolve ways and means to minimise the evils of jhuming.

Roy et. al. (2015) studied the agricultural transition from subsistence shifting cultivation to commercial plantation of rubber in Southeast Asian uplands including Tripura and North Eastern state of India. The study highlight that although there are reports of positive impacts of this transition both on the socio-economic conditions of the concerned people and on the ecology of the concerned area, it is still questionable as there are certain adverse reports and assumption. The paper see rubber plantation as an alternative option for the farmers in the area and have ecological and socio-economical benefit.

Satya Dev Jha (1976) analysed the linkage between socio-cultural life of the people of North East India and jhuming. He also made a comparison between the food grains production under shifting cultivation and the population dependent on it, and the effects of jhuming. He emphasised the need for educating and properly guiding the jhumias to adopt the modern methods of permanent culture and scientific cultivation.

F. K. Wadia (1980) deals with cropping pattern, jhum cycle, and schemes proposed for fifth Five Year Plan for the control of Shifting Cultivation in Assam, Meghalaya Tripura and Mizoram. She also analysed two views of the debate on Shifting Cultivation. She observed that a programme that could induct for the control of Shifting Cultivation is the Small and Marginal Farming Development Agency (SMFDA) with proper agricultural extension service which could provide improved irrigation inputs such as seeds and fertilizers, marketing of produce, easy availability of credit.

R. N. Prasad and A. K. Agarwal (1991) analysed the government programme of jhum control in Mizoram. Based on survey conducted in two villages, the authors observed that the beneficiaries of the government programme or project have stopped cutting the forests but the amount provided to them against work programme was not sufficient to engage all the working members of a family throughout the year. They also observed that one of the factors of failure in jhum control was lack of good communication in rural areas for marketing the products. They observed the issue of land settlement certificate or periodic pattas to the settled cultivators, horticulturist, dairy farm owner and cash crop planters have proved very beneficial to divert jhumias from wasteful jhum cultivation.

Thangchungnunga (1997) discussed the history of shifting cultivation, the process of allotment of jhum plots at community level, the process of site preparation, the labour of planting weeding and harvesting, tools and implements used in Mizoram. He also

discussed the institutional aspects of agricultural development in Mizoram, viz., agricultural finance, supply agricultural credit, etc. He suggested full and effective implementation of New Land Use Policy (NLUP) to facilitate application of better farming technology.

Sengupta (2013) studied the changes in the tribal economy of the Reang shifting cultivators in South and Dhalai districts of Tripura following government initiatives to move them from swidden to a more settled form of cultivation. And also elaborates the changes which are visible among the tribal Reangs owing to the government's introduction of the various state led development and rehabilitation programmes that urges them to undertake a more sedentary lifestyle. The Reang tribe in Tripura, which practiced shifting cultivation and still does to an extent, faces serious problems with the state government implementing measures to turn them into settled cultivators.

R. N. Rai (1976) analysed land and water resources in North East India. Problems of land and water management like decline in soil fertility due to shifting cultivation land tenure systems and improper land use in North East India were also discussed. He suggested proper management of land and water resources like land use survey, watershed planning and terracing. He also suggested water resource development, provisions of infrastructure, and package of sources for jhum control and alternative farming system to replace jhuming.

Kalita et. al, (1977) in their study of the hill zone of Assam which comprised of KarbiAnglong and North Cachar Hill districts, they find out that the proportion of farm households below poverty line under settled and shifting cultivation and analysis was done by using two situation viz., only food expenditure and expenditure on food, clothing and housing together. On the basis of food requirement, about 43 per cent of the farm households were living below poverty line under settled and shifting cultivation. Across

the different farm size groups, the proportion of the farm households living below poverty line under settled and shifting cultivation was estimated to be the highest (47 per cent) in group-I and group-II farms respectively and lowest (40 and 34 per cent) in group-II and group-III farms. This might be due to increase in the size of land holding, which was the major determinant of farm income besides other sources of income.

P. C Goswami (1980) discussed characteristics of pattern and extent of Shifting Cultivation in North East India. He analysed jhum cycle the average size family farm in jhum cultivation cropping pattern, tools and implement used and the problem and effects of Shifting Cultivation. He also analysed factors in favour of jhuming and steps to control jhuming. He observed that in spite of many drawback associated with Shifting Cultivation, a large section of hill tribes still practice Shifting Cultivation as it is an integral part of tribal culture with many social institutional and economic factors. He also observed that it is not possible to abolish jhuming by legislation or administrative action alone or even by explaining the defects of jhuming and the benefit of settle farming.

S .G Morab (1982) analysed the settlement pattern, forms of land use, process, Cropping pattern, tools and implement used and economic implication of Shifting Cultivation among the hill Soliga tribe in Karnataka. He observed that the Soliga have preference for Shifting Cultivation. He suggested that to improve the economic conditions of the isolated and illiterate tribal people allotment of land and other facilities would bring about changes in the livelihood of them and integrate them with the socio-cultural life of the nation.

Husain Majid (1993) examined the jhuming scenario with a focus on the agricultural operations, rotation of crops, jhum cycle and the ecological consequence of the existing utilisation of soil and forest resources in Nagaland. He was of the view that primitive technique of land utilisation in jhuming leads to many ecological crises and

creates many socio-economic problems. Despite all the shortcomings, he observed that jhuming cannot be stopped completely as the lifestyle and cultural ethos of the tribal people of Nagaland is closely governed by jhuming operations. While introducing any innovation in jhuming, he suggested that it must be born in mind that the suggested changes and prepared policies should be socially acceptable, economically viable and environmentally sustainable.

Girindra Nath Das (2001) dealt with the various aspects of Shifting Cultivation with reference to N.E. India general and Assam in particular. He also discussed an ethnographic note on the Karbis highlighting their life and culture occupational structure, land holding pattern; extend of influence of income and expenditure among the people. He also assessed different jhum control measures in the hill areas of Assam and the overall impact on the Karbis. He suggests some measures for effective implementation of jhum control programmes. He observed that even though it is a source Shifting Cultivation lands to soil erosion destruction of forest and low land of productivity.

Nathalie van Vliet et. al. (2013) analyzed changes in the extent of slash and burn cultivation and shifting cultivation and the main drivers of change observed in the last 10 years across the Brazilian Amazon. Smallholder farming in tropical forest regions is characterized by a variety of land uses and a diversity of land use pathways. The conversion of forests to farmland has traditionally shaped forest agriculture frontiers in many parts of World and is still particularly important in the tropics. Two general types of changes can be identified: slash and burn cultivation convert it into a permanent field such as pasture and cash crops, allowing no forest regeneration and shifting cultivation cultivated temporarily and then left as fallow for multiple years until they have recovered forest cover and soil fertility.

2.2 Studies on Agrarian Change

P.C. Joshi, (1969) emphasised the importance of the study of agrarian change in the analysis of political change in India. In his opinion knowledge on the type or types of agrarian social structures existed in India before independence is lacking. Lack of a very clear perception of the characteristics of the agrarian structure is wanting in the sphere of planning for rural change. He also observed that there has always existed a great hiatus between the images of the agrarian social structure in the minds of different sections of the political elite on the one hand and the actual conditions of agrarian society on the other. According to him the study of the agrarian social structure is primarily the study of groups connected with land. How to identify these groups and what concepts and categories to adopt for this purpose so as to capture as many features of reality as possible is the central question in any study of the agrarian social structure. Since, land constitutes the chief basis of productive activity in the rural society, the formation of groups is primarily connected with the differentiation of rights over land. The agrarian structure can therefore be further defined in terms of the relationship which exists between those who have command over land and those who operate this land by supplying labour power for productive activity.

Khoda Newaj (1975) highlighted that in certain transformation of agrarian relations that has taken place in the Birbhum district of West Bengal consisting in a replacement of the Kisheni system of cultivation by conventional share cropping or cultivation with the help of hired laborers. Change in the supply of labour. There has been a great increase in the number of landless labourer families. In addition, there is seasonal immigration of labourers from, the adjoining district of Santhal Parganas. The Mayurakshi River irrigation system has changed all this and made possible additional crops on a considerable part of the land. The same irrigation system has reduced the

frequency of crop failures due to drought. The villagers' impression is that the market prices of crops are less stable nowadays than during earlier times. This makes the giving of consumption loans to attached laborers, which had become traditionally, accepted as an obligation of the landowner towards the Kishen, less attractive. As such the landowners find it in their interest not to give out any part of the crop by way of share, but to sell the crops at advantageous prices and use the cash to give out loans to casual laborers by way of 'dadán', thereby obtaining control over a committed labour supply. These are the reasons advanced by the villagers themselves. Another set of considerations relate to the change in the cost of production relative to the value of output. However, the relative decline in the profitability of the arrangements surely constitutes one factor, in addition to those cited by the villagers, causing the system to lose its appeal.

Pandey (1994) pointed out that the agrarian structure in colonial India was an admixture of feudal relations of productions and hybrid bourgeois property right on land. At the same time, the development of irrigation facilities and cultivation of commercial crops has been taking place since the late 19th century as subsistence agriculture had started providing space to market based production under the aegis of 'colonial modernization and the resultant change in agriculture. The objective of the land reform measures in the main was to remove some of the vestiges of an outmoded order which had so long hampered progress and to allow land ownership to go into the hands of cultivators. The measures have left large sections of the small peasants, poorer tenants and landless labourers deprived of their due shares in agrarian production and benefits. It is of relevance here to see the exact nature of land reforms and cooperatives under 'mixed economy' which are quite distinct from collective or communal ownership, farming and distribution.

Sethi (2001) held that the direction of land politics and land reform in India will continue to be one of struggle and hope. It will be important to widen the scope of land reforms beyond the mere activity of redistribution of land or revisions of ceiling limits. In order to be effective, land reform must be seen as part of a wider agenda of systemic restructuring that undertakes simultaneous reforms in the sectors of energy and water. Deeper structural reforms will ensure that the exercise of land redistribution actually becomes meaningful, enabling small farmers to turn their plots into productive assets.

Rao (2003) in his study on the life and livelihood of Santal Parganas focused on commercialization, export orientation and market development in agriculture and industry. A stated priority of land reform in the Santal Parganas is distribution of surplus lands to the landless. The task of distributing the land and fixing the rent payable amongst the 'raiyaats' (cultivators) was left to the headman. With the stability of tenure and fixity of rent provided by this settlement, occupancy and cultivating rights became valuable. The studies also found out that to overcome the usury laws and the restriction on interest rates, peasants repaid debts with their land. Transfer of substantial parts of the paddy growing lowlands followed, from Santals to non-Santals.

Retna Raj (2003) held that in the traditional rice based agricultural system of Kerala land was in the hands of a few households especially with the upper castes. Traditionally landholding was a major trait of status symbol and possession of land was solely confined to upper castes communities. However the pattern of land relation was not unique. It differed in three regions of Kerala. Due to the earlier phase of the land reform legislations in 19th and 20th centuries and the disintegration of matrilineal joint families, Christians and the advanced among the enterprising backward classes gained ownership rights especially in Travancore and Cochin. The implementation of the land reform programmes of the Kerala Government subsequently brought further changes. Data

regarding the land holding pattern indicates that there is notable reduction in the land size over two successive generations. If the same trend persists over the next generation, majority of the farming households will be forced to pursue non-agricultural occupations to maintain their livelihood. The reduction in the size of the land will have serious implications in the livelihood choices of the agrarian households. One of the immediate consequences would be the tendency to aspire for supplementary occupations or leaving farming altogether.

Seidenberg (2003) in his analysis of India's land reform program, most international financial institutions highlighted the basic problems that rural poor people face is accessing land and security of tenure, and they advocate redress of this situation through the structural reform of property rights, to create land markets as part of a broader strategy of fostering economic growth and reducing rural poverty. While the revolution did ease India's grain situation and transformed the country from a food importer to an exporter, it also enabled the rich farming community to politicize subsidies, facilitate concentration of inputs, and increase dependence on greater use of capital inputs such as credit, technology, seeds, and fertilizers. Moreover, the green revolution had increased Indian food production. A large emphasis has, therefore, been placed on the need to establish the basic legal and institutional framework that would facilitate a market takeoff in land and resource exchange. The studies suggest for commercialization of agriculture which gained a foothold in India first in the 1960s, with the green revolution in Punjab, when the World Bank, along with the US Agency for International Development (USAID), promoted agricultural productivity through importation of fertilizers, seeds, pesticides, and farm machinery. Farmers rate scarce labor as a major constraint on shifting cultivation nonetheless, a tendency towards lower labor input with shorter fallow

periods is observed, shifting cultivation is likely to remain the most suitable farming system in the near future.

Ajami (2005) in his study on Land-reform program of the 1960s and the 1979 revolution found that it represent the primary turning points in the rural transformation and reform, through intense state intervention, dramatically changed the traditional landlord share cropping system (nizam-iarbab-rayati) Peasant uprisings, the forcible occupation of large estates, and the agrarian policies of the post revolutionary regime have led to the demise of the urban agricultural bourgeoisie and the empowerment of the peasants. Agricultural production depended heavily on irrigation, the water being supplied by both the Sivand River and twenty-seven irrigation pumps tapping groundwater. The cropping pattern, mainly wheat, barley, and sugar beets, had changed little over the previous decades, except that the cultivation of melons had increased considerably. However, not all rural households benefited from the land reform. Due mainly to the scarcity of agricultural land, some 35 percent of the households from the studies did not hold cultivation rights (nasaq) were mostly employed in agriculture as wage laborers (khwushnishins) and were not included among the beneficiaries of the land-reform program. The implementation of land reform reinforced the trends toward development of capitalist agriculture adopting new agricultural technologies and increasing crop diversification. Most studies contend that the land-reform program did not succeed in improving the living conditions of the majority of the peasants and, in fact, was a major contributing factor to Iran's agricultural stagnation. The dramatic rise in yields is primarily the result of the adoption of Green Revolution technologies, especially fertilizers and high yielding seed varieties, and increased investment in irrigation pumps. The emerging production system is a shift from peasant labour intensive agriculture to

mechanized commercial agriculture and from large urban (absentee) landlord capitalist farming to small and petty capitalist farmers.

Mohanty (2005) pointed out that after independence when India launched the task of nation building; it chose the path of planned development. This was flagged off with the launching of Five Year Plans. Since economic development was conspicuously poor, planners focused more on economic development defined mainly as the growth of GNP, which was symbolized by new factories, dams, mega projects, mining. The state has not taken this enormous problem seriously. The continued existence of the certain problems highlights the absence of an effective policy, and thus calls for in depth research which in turn would improve the formulation of development and resettlement policies. He argued that displacement caused by large development projects has actually resulted in a transfer of resources from the weaker sections of society to more privileged ones. This has generally been the case with India's development model. Development projects have done little to alleviate existing social inequalities. On the contrary, they have further aggravated the social structure in favour of the already socially, economically and politically powerful.

Rath (2005) studied the historical aspects of land alienation among the Kandhas, the largest tribal group in Orissa and known for their daring and assertive attitude since centuries.

Panda, (2006) in highlighted the need for tribal development. Also mentioning that their primitive way of life, economic and social backwardness, low level of literacy, hackneyed system of production, absence of value system, sparse physical infrastructure in backward tribal areas and demographic quality of tribal areas coupled together make it imperative for a systematic process of development of tribal and tribal areas. Raising their productivity in agriculture, horticulture, animal husbandry, forestry, cottage, village and

small industries and provision of employment in all seasons will go a long way in reducing the incidence of poverty of Scheduled Tribes. However, creation of employment potential during the slack season is a prime need to ward off starvation for a few weeks in a year, which is a normal feature in some tribal areas. There should be provision of capital inputs, technology, marketing, training etc. to augment production in tribal areas. Implementation of effective programmes may go a long way in removing poverty to a great extent. There is, thus, a continued emphasis on raising the levels of productivity and creation of employment opportunities. This, in turn, will call for higher investment by way of special central assistance, flow from state plan, from financial institutions and central sector projects. This is inevitable as with increased price levels, a much higher investment would be necessary for a family in order that the assistance can have a dent on poverty and enable the family to have a sustained but reasonable level of income to cross the poverty line. These are the basic needs for any developmental effort in the tribal areas. Unless the forces of destabilization are checked and corrective measures applied, the provision of social and economic services will not have any significance. The levels of socio-economic development vary considerably between nontribal and tribal population, between one tribe and another tribe and even among different sub-groups of a tribal group.

Zaitinvawra and Kanagaraj (2008) attempted to study the changes in the agrarian structure in the wake of switch over from shifting cultivation to settled agriculture in Mizoram. They found that as a result of switch over from shifting cultivation to semi settled agriculture significant and substantial changes in the agrarian structure, tools and implement use, cropping pattern, input use, and perception of the farmers on the social ecological consequences undergo sea change. Yet no significant difference in the income of the cultivators was observed by them.. In agrarian structure, the size of land holding

had increased significantly but there was no change in the actual size of the land being cultivated (operational holding). In contrast to the expectation of reduction in the tools use significant increase in the total number tools and implements used was observed. The number of forest clearance tools and harvesting tools did not significantly decrease as expected. On the other hand, the number of weeding tools and land preparation tools has increased significantly. As switch over from shifting cultivation to semi settled agriculture occurs, the cropping pattern also undergoes significant and substantial change. Though the number of crops did not change significantly as expected there is a qualitative transformation from subsistence to commercialization takes place. The number of subsistence i.e. food crops meant for household consumption decreased significantly while that of commercial crops i.e. vegetables and fruits increased significantly. As regards input use in cultivation no significant changes were observed in the seeds use, while there were significant changes observed in the case of organic and inorganic input use and labour use. The frequency of use of local seed as well as HYV seed did not change significantly. Unexpectedly use of both organic and inorganic input use have increased significantly. As regards labour the frequency of use of both family labour as well as hired labour did not significantly change. But in the labour use the frequency of use of male labour did increase though the female labour use frequency did not change significantly. As regard standard of living of the cultivators the statistical analysis indicated no change in the income of cultivators as result of the switch over to semi settled cultivation though cropping pattern, tools use, inputs use and labour use have changed significantly. The farmer's perception on the problems of shifting cultivation seem to have changed due to the switch over significantly with regard to the social ecological consequence but not with regard to the personal difficulties. Interestingly, a

greater realisation of the social ecological consequences of shifting cultivation was observed due to the switch over to semi settled agriculture.

Batterbury (2007) probed into the agrarian change and resource management in developing countries, focusing on three observable trends such as diversification of livelihoods, intensification or dis-intensification of agricultural production, and changes in the political economy of agriculture, including new conditions of production brought about by factors that are largely external to the society. A conclusion is made in such a way that the link between population intensity and agriculture intensification, measured in term of land use or labour input, is still unclear. That relationship is mediated through other factors, such as land availability, levels of available technology in agricultural and the presence or absence of different exit options for rural households. At higher population densities we find more intensive use of inputs to maintain soil fertility. The study also shows that communities typically gravitate towards dual demand production to meet both subsistence and market, where such market possibilities are available. Farmers can alter production, migrate, or change their main livelihood activities, but few households abandon agricultural activities entirely. Dual demand farming systems have, however, emerged over time in the West African Sahel, across much of East Africa, in the lower density areas in South Asia, and some other less developed areas of South East Asia like East Timor, where subsistence needs have always had to come first because of decades of conflict and an absence of regional markets.

Thiesenhusen (1974) probed into the Chile's Experiments in Agrarian Reform. He found that that Age of the household head and total effort based on a measure of days worked are not statistically important in determining variation in gross income given the other variables considered. But the crop hectares and number of animals owned were highly significant while education of the husband, number of people being supported, and

yield increasing inputs per hectare were less significant. The most manipulate able variables are probably yield increasing inputs and equity in animals. An investment in fertilizer and seed returned in gross income per hectare during 1970 and an investment in livestock yielded a gross during the year. Thus agrarian reform appears to presuppose a dramatic increase in the political power and influence of the rural poor. And secondly, the problem of institutional design—the creation of property arrangements through which efficient, modern agriculture may proceed while serving the ends of equity and welfare—is a knotty one(Tawnenga and Uma Shankar 1995).

Benedict et. al. (1998) studied the process of the agrarian transformation in China and Vietnam. Their research highlighted that Land reform eliminated tenancy and hired labour, equalized land ownership within villages, broke the power of the dominant landed classes, and consolidated the position of the Communist Party at the village level. Collectivization transferred authority over land and labour from rural households to local authorities, increased the scale of cultivation, and sharply restricted but never eliminated household production and markets. Households emerged as independent producers, as the state and collective relaxed controls over agricultural production, prices, labour and accumulation. Markets revived, with diverse forms of private and mixed ownership enterprises. Legacies from the first period, however, continue to influence rural society in both countries.

Moyo (2011) examined the empirical facts about the actual outcome of Zimbabwe's land reform, based on years of field research. The character of Zimbabwe's land reform has been redistributive, and the extent of this has been wide enough to trigger significant progressive changes in the agrarian structure. The distribution of land among land reform beneficiaries has been relatively uneven, with some receiving larger land allocations than others, and this in turn influenced the differentiated access of these

groups to farming services and infrastructure. Three decades of land reform has recast land based social relations in important ways, with the poor gaining more than which was previously believed.

Zamchiya (2011) analysed the Zimbabwe's Fast Track land reform to the district of Chipinge in Manicaland province in south eastern Zimbabwe highlight the importance of particular agro ecological, political and social dynamics. Since 2000, Fast Track has radically transformed the agrarian structure of Chipinge district from one dominated by white owned large scale farms to one dominated by a large group of smallholder producers. The ZANUPF (Zimbabwe African National Union Patriotic Front) ruling elite manipulated people's diverse claims to land by ensuring that political loyalty and patronage took centre stage in beneficiary selection. This set a political landscape where land reform beneficiaries have to continuously reassert their legitimacy through political loyalty to guarantee their tenure. Due to corrupt administrative practices in land allocation and the politicized and autochthonous nature of the land invasion, civil servants, war veterans and traditional authorities were the major beneficiaries of Fast Track. Political patronage extended beyond gaining access to land as land reform beneficiaries have to continuously show political loyalty through correct political allegiance in highly politicized resettlement landscapes. A new agrarian structure has emerged but one shaped mainly by socio-political dynamics rooted in the ZANU-PF ruling elite.

Moyo (2011) discussed the impact of the redistributive land reform and agrarian reforms since 2000 progressively on Zimbabwe's agrarian relations. Complex structural changes are explored using a series of surveys, secondary sources and official documents. Findings are made in the areas of exploitative agrarian labour practices which continue despite the diversification of labour towards numerous farms and other enterprises. Agricultural output declined primarily due to reduced inputs and credit supplies, and

frequent droughts, but has been rising since 2006. Increasing export production now involves more producers, driven by the diversification of agrarian merchants and contract farming. Agro-industrial capital has gradually increased its domestic operations in the supply of inputs and marketing, especially after re-liberalisation in 2008. Many new farmers accumulate assets although some struggle for social reproduction. Agrarian politics now entail new struggles over agrarian markets, land and labour rights. Land reform has restructured Zimbabwe's agrarian relations by reconstituting the agrarian structure, mainly through expanding the numbers of small and middle scale agricultural producers and reconfiguring the underlying labour relations. While access to land was broadened, large scale farm holdings and plantations persist with disproportionately. Agrarian labour relations are now more dominated by self employment in diverse farming and nonfarm activities, and part time wage-labour is more common, prevailing wages and incomes remain repressed by low productivity, exploitative commodity markets and slow recovery of production in other economic sectors. Heterodox interventionist policies introduced from 2002 initially shaped changes in the agrarian markets, including uneven access to subsidised inputs, shortages of goods and hyperinflation. Overall agricultural output had declined, but this began to rise slowly and selectively from 2006. A broader range of producers invested in cultivating much more land mainly for food, although land productivity remained lower than is potentially achievable due to limited access to farming inputs in markets, despite the subsidies. This restructuring of Zimbabwe's agrarian relations has the potential to deepen the autonomy of the peasantry and intensify productivity towards increasing supplies of more nutritious foods and raw materials for the home market.

Makki (2012) examined the momentous transformations in the agrarian social order of contemporary Ethiopia. Argument is made on the contemporary world economic,

food, and energy crisis is accelerating processes of commercialization and enclosures that are profoundly altering the social and physical landscape of smallholder farming. Ethiopia might seem an unlikely target of land grabbing or large scale agribusiness investments. Chronically scarred by famines and food deficits, its socio political history equally militates against any easy assumptions of a social space conducive to capitalist agribusiness. Yet the social universe of Ethiopia's smallholders has come under pressure from state and market forces, generating a profound process of differentiation and displacement that is reconstituting older socio spatial hierarchies in new social forms.

Spoor (2012) compared five case studies, looking at agrarian actors, property rights, state influence, and rural poverty in Russia, Armenia, Moldova and Uzbekistan in the EECCA region, and China's Xinjiang province in Asia. According to the author a new dual agrarian structure emerged, consisting of large farm enterprises with much less social functions than they had before, and very small peasant farms or subsidiary plots. The studies concludes that state influence is still substantial, property rights regimes are quite diverse and rural poverty remains medium to high. State led agrarian reform, in particular where a redistributive or restitution based land reform was implemented led in some cases to land based wealth redistribution, but policies and institutions were lacking to support the individual farm sector. More often the outcome was a rapid transfer of land in the hands of corporate farm enterprises, reversing the initial process of re-peasantisation.

Tuma (1963) discussed the relationship between land tenure reform and economic development. Land reform has continuously been a major issue of national policy in one country or another ever since the French Revolution. Frequently land reform has been used interchangeably with agrarian reform and both concepts have been equated with land distribution and sometimes even with abolition of feudalism. On the basis of loose

definition of the concepts one author at least has gone so far as to recommend tying technical assistance to under developed countries to the initiation of land distribution. In this sense, land reform implies change of title to the land, change of status from tenant to owner, or from public to private ownership. Historically land reform has meant a change in tenure and generally redistribution of land in favor of the peasant and may also indicate a change from individual to collective ownership or vice versa, depending on the specific reform measure. In this sense, land reform implies change of title to the land, change of status from tenant to owner or from public to private ownership.

Cusker (2004) assessed the impact of South Africa's land reform program on land use change in rural areas of Limpopo Province. Land use change was examined on five Communal Property Associations using remotely sensed images and quantitative and qualitative survey techniques. The primary reason for the lack of land use change to more productive states was that the land redistribution policy was not sufficiently sensitive to the diversity of rural livelihoods and other reasons include farm level general disorganization, lack of capital and labor, gender inequities, and age distribution. Regional political diseconomies also hindered change, namely poor tenure relations and a persistent urban bias.

Arun (2012) studied the gender dimensions of the changing nature of agricultural households in northern Kerala, India. Rural livelihoods are constructed through differences of gender and class, riddled with complex and multiple negotiations and processes. As household livelihood strategies are increasingly based on male migration and non agricultural diversification, gender roles are reconstituted and renegotiated, which may then challenge prevailing gender ideologies. So in the light of changed social roles, and institutions and policies should be responsive to the needs of local farmers, particularly in the milieu of the diverse and complex nature of farming households. In the

Indian context, a mixed trend of women's participation in agriculture is seen. The feminization of agriculture has been noted with more women engaged in both agriculture related activities and cultivation, particularly in areas of male migration, but still receiving lower wages. Livelihood options are mediated by both external and internal factors. External factors, such as policy changes, resource endowments, and access to markets, influence the nature of diversification and livelihood strategies.

Joshi (1969) discussed the types of agrarian social structure and some of the important changes that have occurred in the agrarian structure in India since independence. Two broad sub-types of Indian agrarian social structure had two broad features. Many, the relative weight of the statutory type of landlord in the property structure were much greater as compared to other regions where the usurious type of landlordism was more prevalent. Peasant producers did not figure much in the ownership of land, peasant proprietors constituted a highly significant in the entire landownership structure in Zamindari areas. Important differences also existed in the manner in which caste and agrarian relations were interrelated. Thus the property structure in the first type was dominated by upper castes and the peasant producers were drawn from many low caste groups. The unique feature of the Indian agrarian structure was the overwhelming predominance in the middle lower rungs of the economic ladder of interpenetrating groups with a mixed status. The only thing common among these groups was not a common class position but their poverty and depressed economic status, and even here there existed among them minute graduations of poverty and social differentiation. The emergence of a distinct interest group of large farmers has also led to the crystallization of waged labour as a distinct social existence form of labour power for a section of population traditionally earning its livelihood by working in the fields of others under diverse conditions and arrangements.

Cochet (2004) explored into the countryside of the Central African Highlands. It was concluded that population explosion, by provoking a considerable increase in land pressure, has led to an expansion of cultivated areas to the detriment of grazing and fallow lands, resulting in a decline of animal husbandry, a reduction in the average surface area per land holding, the cultivation of sloping lands, worsening erosion, an overall decrease in soil fertility and yields, and a situation of widespread under employment in the countryside. Agricultural techniques having remained unchanged, it would appear that the population explosion provoked a population resource imbalance that is at the root of present problems.

Mahmood Hasan Khan (1983) probed into the class formation and agrarian transition in Pakistan. According to him the process of class differentiation under way is a manifestation of capitalist development. The agrarian transition in Pakistan was reflected by the disintegration of the peasant and feudal systems. The studies highlight the process of agricultural development in an underdeveloped country where, with the expansion of forces of production, the pre-capitalist relations of production are slowly dissolving. Landlords have not been entirely in favour of evicting their sharecroppers. Subsidized inputs, including tractors and other machines, have raised private profits which the landlords would not want to share with their tenants. Some landlords have adopted the policy of sharing the cost of all modern inputs with sharecroppers, even of those which weaken the bargaining power of tenants and make the cost of animal power high to maintain.

Mahmood (1990) studied the technical and structural change in Punjab. This study attempts to broaden the existing dichotomous framework. An agrarian sector and by analogy all agrarian sectors cannot be assumed to be homogenous in the production conditions and, therefore, in the direction of change. An exogenous endogenous model

has proved useful in explaining this differential in trends. Endogenous factors specific to each region explain the differentials between regions. In the canal colony village Chak, the exogenous factor of High Yielding Variety enhanced profitability per acre has created an incentive to increase operated area.

Saleth (1991) explored the process of the land reform implemented in Peru during 1969-78. The reform has transferred 50 per cent of the total farm area to about 33 per cent of the rural families organized mostly under various forms of cooperatives to preserve agricultural productivity while affecting an unequal pattern of rural income distribution. Land reform formed an integral part of the military's comprehensive programme for the economic and political modernization of Peru with a view to create the necessary conditions for autonomous industrial development supported by state capital implemented with the major objective of modernizing the traditional agrarian structure by creating a market oriented and technically responsive rural middle class capable of providing economic and political underpinning to indigenous industrialization and moving land based agrarian capital to the industrial sector. The agrarian sector has been reorganized and modernized without sacrificing productivity while affecting a moderate but unequal income distribution pattern. The reform has promoted a rural middle class capable of providing both an expanding rural market for consumer goods and an increasing agricultural surplus to the urban sector. The reform has succeeded not only in moving agrarian capital into the industrial sector but also in converting the coastal oligarchies and the hacienda owners of the sierra into an industrial bourgeoisie by cutting their links with land.

Kayatekin (2007) studied the main theoretical approaches to the agrarian question. The theoretical tensions in the book are fruitful for rethinking the agrarian question and studying the contemporary analyses of agrarian dynamics. The rise of the fresh fruit

vegetable complex in parts of the third world can be explained, in part, by changing middle class tastes. In countries, such as Mexico a significant aspect of this rural transformation has been the increasing marginalization of a very large number of rural producers, such as those producers specializing in traditional food crops of maize and beans. We need to be warned against an exclusive focus of analysis on agro-food industries at the expense of the marginalized rural populations.

Borras Jr. (2009) highlighted the Agrarian transformations within and across countries significantly and dynamically altered during the past few decades compared to previous eras, provoking a variety of reactions from rural poor communities worldwide. The changed and changing agrarian terrain has also influenced recent rethinking in critical inquiry into the nature, scope, pace and direction of agrarian transformations and development in terms of theorizing, linking with development policy and politics, and thinking about methodologies. Only peasant and family farm agriculture feed people, while agribusiness grows export crops and agro fuels to feed cars instead of human beings.

Lodhi and Cristóbal Kay (2010) highlighted the origin, development, and current meaning of the agrarian question. Where part one of the survey explores the history of the agrarian question, elaborating its origin in the work of Marx, Engels, Kautsky, and Lenin, and its development in the work of Preobrazhensky, Dobb, Brenner, and others. By the end of the twentieth century new understandings had been attached onto the classical account of the agrarian question developed in the nineteenth century. The agrarian question offers both theoretical and empirical coherence as well as the analytical tools and analytical sensitivity necessary to understand ongoing processes of agrarian change in contemporary developing capitalist countries.

Thomas Schweizer (2006) examined the impact of the new rice technologies in Klaten, Central Java and a region considered the cradle of the Green Revolution in Indonesia. The paper was mainly confined to the analysis of labour use and labour relations in contemporary rice production, the recruiting of workers, the payment of wages, and the organisation of harvests. Because of the increased number of rice harvests, higher yields and the more even pattern of cultivation over the year, employment in rice production rose as well as the absolute income of farmers and farm hands. The farmer's income rose through the higher yields, and because of the diminished payment of wages and costs in the tebasan harvest. Increased income for all involved in rice production but greater income inequality is thus the paradoxical outcome of the green revolution in Sawahan fifteen years after its inception. The land and inheritance laws have scarcely changed, and monetization and commercialisation of rice production are by no means new phenomena. Former reports on the radical change in cultivation alleged to have occurred in the 1970s tended to give an altogether too static and idealized picture of pre-colonial and colonial agrarian circumstances, which concealed continuity. Rice cultivation and the lives of Javanese villagers have always been subject to change, but surprisingly many features of current production stem from the past.

Zhang (2012) explored in to the process of agrarian transition that has been unfolding in China for three decades and the expansion of agro-capital has also brought contract farming into a sector that had long been dominated by smallholding, independent family farms. According to him with the start of agrarian transition contract farming emerges as a way of bringing capital and capitalist relations of production into agriculture and displacing peasant production. The paper identified three distinctive features of contract farming in China having varied impact on rural inequality, unstable contractual relations and lack of competitiveness with other alternatives and proposes tentative

explanations linked to three features in rural China's political economy, strong collective institutions, active state support for agriculture and strong domestic markets. Contract farming in China's unique political economy context shows not only how variations in the political economy can alter its practice and impact, but also how it needs to be evaluated in comparison with competing alternatives.

Temudo and Abrantes (2013) addressed certain questions concerning the process of change in African agricultural livelihoods and the role of market and agricultural policies and development interventions. They made observations on farmers' responses to external and internal pressures, and analyses how depeasantization progresses and livelihoods have been losing their resilience.

Alpa Shah (2013) explored the significance of the modes of production debates for the radical left in India. This paper reveals how feudal relations were not established there and how it shows the persistence of non-capitalist relations of production in farming and how it illuminates the emergence of class differentiation through processes that bypass the development of capitalism in agriculture. In this paper argument is made on the modern state itself that has played a crucial role in these slow processes of class differentiation in the Adivasi dominated hills and forests of India. Analyzing the agrarian transition in this guerrilla zone the strategy and tactics of the Maoist were criticized.

Lodhi (2010) described the process of agrarian transition took place in Vietnam since the 1980s, which has redistributed land and reconfigured labour markets. Agrarian transition is driven by transformations in social property relations, which are witnessed in the emergence of differentiated access to productive assets and the commodification of labour, changes that form two aspects of a single dynamic process. Landlessness is also observed as a positive choice made by those seeking a better life. Capitalist farming emerges in some parts of Vietnam which facilitated, in some places, the entry into wage

labour of members of farm households. Some of these latter households become landless; some remain in farming, increasingly marginalized. But inequality deepens as a result of the development of capitalism in agriculture.

Alpa Shah (2013) in this study explored the significance of the modes of production debates for radical Left in India investigating whether the analysis of the Indian economy by the underground Communist Party of India (Maoist), or the Naxalites, maps on to agrarian transformations in the heart of their revolutionary struggle, in one of their guerrilla zones in Jharkhand. This study also highlight the absence of feudal relations, the persistence of non-capitalist relations of production in farming and the emergence of class differentiation through processes that bypass the development of capitalism in agriculture.

Ajami (2005) probed into the impact of the land reform program of Iranian Village during the 1960s and the 1979. According to the author land reform, through intense state intervention, dramatically changed the traditional landlord share cropping system. Peasant uprisings, the forcible occupation of large estates, and the agrarian policies of the post revolutionary regime have led to the demise of the urban agricultural bourgeoisie and the empowerment of the peasants. The penetration of capitalism results in the concentration of land holdings by rich peasants and absentee urban landlords and in the mean time the poorer farmers would be dispossessed and converted into a class of landless rural proletarian wage laborers. The structural changes in the pattern of land ownership, coupled with the integration of the village economy into the market, changes in the system of agricultural production, diversification of occupational structure, and shifts in social stratification are indicators of the village transition. The most significant changes are the transformation of the peasant, as perceived in its conventional sense, into a farmer, including the emergence of a small but significant number of petty capitalist

farmers. These two interrelated changes have had far reaching implications in the village's socio-economic structure, which can be expected to contribute to the development of farmer capitalism in the future.

Kishore (2004) discussed the Agricultural stagnation in Bihar in spite of its rich soil, abundance of easily accessible water and a rich peasant tradition. According to the author this stagnation has been ascribed to several factors including the state's colonial legacy, ecological conditions, demographic pressure and most importantly, the land tenure system and the agrarian structure it supports. These factors are believed to have impeded the transition of Bihar's agriculture from a semi-feudal to capitalist production system an essential condition for agricultural growth. From the fieldwork in eight villages of Bihar he concluded that the lack of adequate infrastructure and economic incentives more than agrarian structure has contributed to the agrarian stagnation in Bihar. He felt that the growth potential unleashed by the expansion of shallow tube well irrigation has been constrained by a complete neglect of public sector investments in physical and institutional infrastructure and unfavorable output to factor price ratios.

Bridget O'laughlin et. al. (2013) highlighted the context and dynamics of agrarian change, rural poverty and land reform since the end of apartheid in 1994 in South Africa. This paper draws attention to structural continuities and new elements in the country sides of South Africa, and of the Southern African region. Two key historical and theoretical reference points help focus attention on some central issues: the 'classic' model of dispossession or accumulation in Southern Africa, and 'decentralized despotism' as the distinctive mode and legacy of colonial governance. The paper concluded that the contributions to answering some central questions require further research and debate.

Burak Gurel (2011) argued that small peasant property in Turkish agriculture was stable and strong enough to potentially enable the recently migrated workers to exit the

urban labour market by retreating to small scale farming in their villages and therefore made an upward pressure on wages in the case of Turkey between 1950 and 1980. The impossibility of leaving the labour market by retreating to family farming, the fact that workers derived the bulk of their income from urban wages and the rising working class movement together resulted in a change in the disposition of the migrant workers, so far displaying relative passivity, towards engaging in working class struggles of increasing militancy.

Keyder and Yena (2011) explored the process of deepening commodification in Turkish agriculture which changed the lives of farmers in significant ways. They highlighted how Global circuits have swept away the accustomed networks of information, production and marketing which had been largely established and maintained by comprehensive governmental support policies. New institutions have come into the picture establishing the links between small producers and larger markets. Commercial opportunities introduced by global circuits have led to a thriving market in products, land, and labour. Farming of vegetables and fruits for domestic and European markets dominate agricultural production. Seasonal employment in tourism and in labour intensive crops, supplement household incomes permit the rural population to remain in the countryside. Commodification of inputs and outputs, and the integration of agriculture into the national economy, had been largely shaped through state policy during this era. Through support prices and various subsidies, state policy ensured a sufficient degree of stability for commodity producing farmers as they gradually adopted new technologies and novel crops. Despite transformation in the countryside with increasing mechanization, higher productivity and massive migration to the cities, the rural society centered on the village community remained relatively stable when land transactions were rare and employment opportunity in the countryside was scant. Additionally, farmers also

find their fields becoming a commodity, with demand for new types of land use establishing a market which existed previously only to a very limited degree.

Upadhy (1988) discussed the rise of a new class of businessmen out of the class of capitalist farmers in coastal Andhra Pradesh and explores some of its social and economic characteristics which contributed to the development of a productive and commercialized agrarian economy in the late nineteenth century and the emergence of a 'rich peasant' class, the integration of town and countryside, an early interest in education on the part of the rural" elite, the politicization of caste identity and, later, the green revolution and land reforms. High productivity and profit rates in agriculture have contributed to the development of capitalist tendencies in the system of agricultural production, and the 'capitalist farmers' are accumulating surpluses which they seek to invest in ever more profitable enterprises. The paper concludes that a pattern of urban migration and economic diversification among the rural elite which, over several generations, has produced the new urban business class.

Rasul and Thapa (2003) probed into the process of switchover from shifting cultivation to sedentary agriculture in Nepal, Thailand, and in Indonesia and Malaysia. They discussed the efforts which have been made throughout the region to replace it with more productive and sustainable land use systems. According to them changing from shifting to sedentary agriculture requires of the farmers investment of a substantial amounts of labour and financial resources. Settlers cannot risk losing such investments when their rights to land are not secure. This is one of the major reasons why shifting cultivators in the mountains of Bangladesh, Laos, Vietnam and northeastern India have not switched to sedentary agriculture. The continuation of shifting cultivation is further reinforced by almost free access to forestland provided by customary laws. They felt that an effective shifting cultivation control strategy would require: granting land ownership

rights to shifting cultivators, linking shifting cultivation areas with local and regional market centre through infrastructure development, and provision of necessary support services such as extension, credit and marketing. They concluded that the change from shifting to permanent cultivation does not take place automatically with increasing population pressure. It takes place when the favorable condition created by population growth is reinforced by other appropriate measures, including ownership rights to land, development of infrastructure and provision of necessary support services and facilities.

Bernstein (2015) studied the range of differences about agrarian change in China. The first part concerns with agrarian change in capitalism, grouped by their concern with social forces and dynamics internal to the countryside, rural urban interconnections internal to the 'national', the contributions of agriculture to industrialization likewise within the 'national' and those 'external' determinants grounded in capitalist world economy. The second part draws in the special issue to argue the continuing relevance of questions about commoditization, differentiation and accumulation from below and from above, in agrarian change in China.

Lerche (1998) studied the agricultural laborer's position within the social fabric of Uttar Pradesh during the 1990s addressing the question of how the situation at the local level relates to the wider economic and political development of Uttar Pradesh. The aim of the paper is to deepen our understanding of the Uttar Pradesh agricultural laborers' position by relating it to the east west differences in the general "balance of power" between the agrarian classes and by contextualizing this balance of power within the different agrarian transitions that are taking place in Uttar Pradesh. The author concluded that the post independence land reforms have resulted in a split in the landowning class between the erstwhile Thakur landlords and upcoming OBC peasantry, in east UP, thus providing space for the Dalits to assert themselves in alliance with the OBCs, On the

other hand, the capitalist development in west UP has maintained the monopoly of numerically stronger jats on landownership, thus negating any changes in rural social relations.

Jeroen Adam (2013) probed into the changes in agrarian social structures and relations after redistributive land reform under the Comprehensive Agrarian Reform Program (CARP) on coconut plantations in the province of Davao Oriental, Philippines which was initiated in 1998. The main aim of land reform under the Comprehensive Agrarian Reform Program (CARP) is alleviating rural poverty in the Philippines through a redistribution of economically viable farmlands (both private and public) to agricultural labourers and tenants. The programme intended to reach three objectives such as equity in access to and control over land, an increase in productivity and income for the farmers and the development of the selected tenants and agricultural labourers into self reliant farmers. Despite a legally successful land reform with a redistributive character, reform beneficiaries remain vulnerable players in a competitive market, in which land still remains a commodity and where competition over land, just like in other parts of the world, only seems to be increasing. While taking account of studies that have convincingly illustrated the economic viability of small scale farming in other places in the world, for individual coconut farmers, the output from the land can hardly satisfy basic household needs and additional income generating activities remain limited in the Philippine countryside. Therefore, the majority of reform beneficiaries start running up debts, often resulting in dispossession and a return to their previous landless status. If small scale farming is to be made economically viable in this case, this will need to happen through a more consistent follow up of the farm beneficiaries and additional support for capital inputs and farm technology. Although these different support mechanisms are formulated as an integral part of CARP, in Governor Generoso these

have never been implemented. Where land reform has been implemented, the political control of landed coconut elites is considerably reduced, making some openings for a process of democratisation. New classes and sub-classes have emerged and as a consequence of this, new forms of class conflict have surfaced. Almost half of the redistributed lands and resources are being taken over by alternative, regional business elites who have entered this rural structure through semiformal or informal arrangements. A new social structure is emerging, which puts a rural proletariat against a newly emerging, regional and thriving business class. This seems to indicate that struggles for the political and socio-economic emancipation of the rural poor in the post CARP era will need to go beyond the traditional landlord versus tenant dichotomy and take into account this more complex and diversified social structure.

Jingzhong Ye (2015) discussed the recent developments in land and agriculture, particularly exploring the transitions of land and agricultural institutions in China since 1949. This paper concluded that the state has been strategically responding to various challenges in order that land institutions and policies are always geared to achieving agricultural modernization. During the state's continual drive for modernizations, particularly agricultural modernization, peasants' livelihood is impacted and needs to be protected. The evolution of land and agriculture in China has been closely connected to the overall framework of the country's development paradigm and the associated governance politics, which have a strong focus on the pursuit of accumulation, industrialization and modernization. Agricultural modernization has been always the national development goal and primarily involves specialization, mechanization, scaling up and technocracy. The authoritarian Chinese state has mobilized itself to respond to these challenges and never abandoning the pursuit of agricultural modernization. Productivity and efficiency have always been the focus of any changes within land and

agricultural institutions, in order to create the basis for capital accumulation. The institutional transitions of land and agriculture clearly demonstrate that China's development has been continuously urban biased, and that agriculture and the countryside have been continuously supporting industry and urbanization in various ways.

Harriss (2013) studies the redistributivist land reform policy of all three major Left parties of India. He highlighted the current state of agrarian production relations to scrutiny, in the light of contemporary research and scholarship which strongly suggests that classic semi-feudal landlordism has very largely gone. For all the evidence of the 'declining power of caste hierarchies' and the reduced significance of the village, landed power remains a major factor in Indian politics and society. After independence, instead of abolishing landlordism, the Congress rulers adopted agrarian policies to transform the semi-feudal landlords into capitalist landlords and develop a stratum of rich peasants. The development of capitalism in agriculture under State sponsorship has led to a sharp division between the rural rich comprising the landlords, capitalist farmers, rich peasants and their allies and the mass of the peasantry mainly agricultural workers, poor peasants and the artisans. The development of agrarian capitalism has continued since the high days of the 'Green Revolution', when the mode of production in Indian agriculture was so much debated. There is strong evidence for thinking that the agrarian production relations semi-feudalism referred to by the Left parties as landlordism, have been substantially transformed over large parts of India.

Bengoa (2013) reviewed the main trends in Chilean agriculture and rural society, drawing on data gathered principally in Colchagua Province, which is known for its fine export wines. Rural society in Chile has undergone profound change over the past few decades. For centuries, large haciendas had dominated Chile's Central Valley. There has been a marked shift in emphasis towards specialization, exports and off-farm agricultural

resources. A seasonal labour market has arisen, employing predominantly female workers, whose precarious work conditions stand in marked contrast to the success of Chilean agricultural exports. Chilean rural society in the Central Valley, 200 years after independence from Spain, has undergone many changes. Amongst these is the near total destruction of the formerly dominant hacienda system. This liberalized the market for land, water and, above all, labour. The subsequent opening up of the economy to foreign trade, the transfer of state enterprises to the private sector and the signing of free trade agreements all paved the way for tremendous agricultural expansion. The deepest change is at the level of the individual. Thousands of seasonal workers now form the base of rural society in the centre of the country. Residing in towns and rural villages, large numbers of people move around the country in search of seasonal or temporary work. The modernization of everyday life coexists with vulnerability and poverty. Economic growth has taken place, or so it seems, without rural development.

Gerber and Veuthey (2010) investigated the effects of the penetration of capital into the rural sphere, resulting in resistance campaign of a local NGO originating from a peasant organization in coastal Ecuadorian. They argued that the agrarian question also includes an environmental dimension, thereby providing space for a fruitful dialogue between political ecologists and students of agrarian conflicts. An ecologically unequal exchange takes place between industrialized centers and extractive regions forced to bear the unpaid socio environmental costs. As a result, forms of resistance appear in conflicts over mining, cattle-rearing, forests and ever more over the industrial plantations of oil palms for agro-fuels, soybeans for the food industry, or pines and eucalypts for paper production. Of all agricultural technologies, exotic plantation species have perhaps the most profound effects on peasant farming, because they are imported together with characteristic large scale patterns of land use change and social division of labour. New

tree species are indeed cheaper capital investments than major works such as irrigation or greenhouses, and they can be planted in marginalized regions. Consequently, as new technologies and exotic species are introduced, the potential of the land changes, and peasants may be persuaded to sell their farms to take advantage of the rising land values that go hand in hand with the introduction of new plantations. Furthermore, tree farming is sometimes close to mining extraction in the sense that after the initial ground clearance, water and soil nutrients are quickly absorbed by fast growing trees, generating water shortages, land impoverishment and pollution by agrochemicals.

Friese (1990) assessed the development of forces and relations of production in agriculture in the Upper Doab of Uttar Pradesh especially the Muzaffarnagar and Meerut districts, which are characterised by high agricultural productivity. The paper intended to analyze the view how the green revolution of 1960s introduced a new mode of production Muzaffarnagar and Meerut districts. Analysing the developments with regard to the property connection and the real appropriation connection the paper trace the emergence of peasant capitalism in the region and how they seek to provide an alternative to the prevailing view of agrarian capitalism. Particular emphasis is placed upon the development of a combination of generalised commodity production and increasing organic composition of capital as evidence of a capitalist trend. In concrete terms, this means examining data on the development of cash crop production, as well as on productive investments in agriculture mechanization, the introduction of new implements and inputs.

Ghosh (1998) studied the effects of agricultural development and agrarian structural change on rural poverty in West Bengal. The paper highlight the changes that have taken place in the agrarian structure which seems to have reduced the incidence of rural poverty via agricultural development channel, but at the same time have generated

adverse effects on it via direct distributional channel. Agricultural performance appears to have alleviated rural poverty through trickle-down effect. Labour productivity augmenting growth in agriculture appears to have stronger effect in reducing rural poverty than any other growth process that does not augment labour productivity significantly. Agrarian structure has long been recognized as one of the most important determinants of agricultural development. An agrarian structure characterized by highly skewed distribution of land, widespread share tenancy and interlocked factor markets has been considered responsible for agricultural backwardness in large parts of India. However, improved agricultural performance appeared to have reduced the incidence of rural poverty significantly through trickle-down effect. The results of the studies revealed that trickle-down process had been in operation in rural West Bengal. Moreover, labour productivity augmenting growth in agriculture was found to have stronger effect in reducing rural poverty than any other growth process that does not augment labour productivity significantly.

Temudo and Abrantes (2013) in their case study in southern Guinea-Bissau analyzed how the African agricultural livelihoods change under stressful conditions and how the market and agricultural policies and development interventions impact on both agricultural and social change. The paper also consequently highlighted the food self sufficiency and ask question on which long term factors contribute to ‘depeasantization’? The paper also analyses how ‘depeasantization’ progresses and livelihoods have been losing their resilience. The paper concludes that farmers have been diversifying their activities, shifting from food to cash crops, from one cash crop to another, and from cash crops back to food production, all according to changing policies, economic opportunities and social transformations. The post-colonial failure to improve living conditions in rural areas, the low price of agricultural products, the difficulties in marketing them due to poor

infrastructural development, and the perception that development funds are being usurped by the urban elite and by project staff have all contributed to reinforcing young people's prejudice towards agricultural work and the countryside. The high rice prices on the international markets in did not benefit local farmers and even increased food insecurity, as they were unable to immediately respond to the new opportunity. The food scarcity did, however, highlight the vulnerability of dependence on the market and revived farmers' concerns about food self sufficiency. The fact that Guinea-Bissau agriculture is still mainly organic and relies on farmers' own seeds creates the potential for the adoption of an agro ecological approach to a food sovereignty policy. Countries such as Guinea-Bissau where poor governance and political instability hold down development and land pressure is, in general, still low do not need a Green revolution.

Luetchford and Pratt (2011) studied the overlapping political and cultural roots of an innovative farming cooperative including ex-labourers and small farmers in Andalusia. The values involves the realization of a food chain in which no capitalist enterprise can extract profit from their labours and various conceptions of personal and local autonomy, shapes much of their practice of organic farming. Nevertheless, their labour has to generate an acceptable livelihood through selling food in an environment dominated by large scale commercial agriculture in both the conventional and organic sectors. The article explains how they achieve this by building ties with consumers around a variety of shared values. More commercially oriented growers in Andalusia tend to be involved in extensive farming, or use intensive methods, specialist machinery and wage labour to produce primarily for export. At a commercial level, the regulatory regime provides a framework for farming practices, both in its rules and in its silences. Pueblos Blancos operates in the market, but not unconditionally, and the conditions it sets on its market engagement, constitute its political values. These values are composed of at least two

strands. The first is supplying food that is fresh, local, and free of chemical additives and produced in a way that is environmentally sustainable. The values are built out of traditional local understandings of food and its qualities, though they have been reconfigured by the recent industrialization of agriculture and the proselytizing activity of the organic movement. The second strand of values is embedded in the attempt to produce and distribute food through economic relations that allow no space for capitalist profit taking.

Zhang (2015) studied the interaction of rural differentiation, land politics and rural livelihoods in rural China. Transforming the once dominant small holding, family based agriculture has become a focal point of the government's programme of rural rejuvenation, where a range of economic changes unleashed by urbanization and industrialization also converge. The paper also discuss how the Chinese path of agrarian transition contribute to ongoing debates on key themes in agrarian studies, including both the agrarian questions of capital and of labour, and how agrarian political economy offers unique perspectives on the overall processes of capitalist development in China. In the context of China, it is hard to understand agrarian change, transitions and crises without reference to internal migration and the links between town and countryside what Bernstein calls rural urban interconnections. Therefore, both the agrarian questions of capital and labour imply challenges and contradictions inherent to the process of capitalist development, the burden of which is unevenly distributed among different classes of labour and capital. This paper provides new evidence on salient characteristics of the entry of capital into agriculture in a country that has already substantially industrialized. The late development of capitalism in Chinese agriculture is particularly interesting, as it does not appear to be a necessary condition for industrialization and overall capitalist development, but follows the rapid social and economic transformations already achieved

during the process of economic reforms. However, this late development of capitalism follows a period of collectivization and state led accumulation and industrialization the study of agrarian questions in China opens up a wealth of possibilities in the study of agrarian transitions worldwide, and therefore should be of interest to those working on other regions and countries of the developing world.

Latt and Roth (2015) examined how the discursive construction of ethnic identity has facilitated the particular form of agrarian intensification and labour restructuring under way in the uplands of Thailand. Agricultural intensification, followed by the promotion of 'safe' and then organic production, has relied upon the construction of Hmong farmers as environmentally destructive and in need of development, while Shan labour arriving from Burma are simultaneously constructed as illegal migrants, a social nuisance and hard workers, helping to make them into an available, willing and preferred labour force. The paper argue that the construction of ethnic identity in these instances enables the agricultural changes under way and, thus, the particularities of agricultural change cannot be understood without careful attention to ethnic politics. The prevailing ethnic politics in the region has facilitated an ethnic restructuring of agrarian labour and the related flexibilization of employment, both of which have made particular agrarian changes possible. The transitions from forest to shifting cultivation, to fixed-field intensive farming and now to Good Agricultural Practices (GAP) and organic production have been facilitated and made possible by the positioning of Hmong as environmentally destructive farmers in need of new production techniques and processes. The availability of cheap Shan labour enforced the mainstream to be safe and environmentally friendly agriculture and has provided Hmong farmers with the ability to increase cropping frequency. This paper helps to demonstrate the importance of ethnic politics in the

processes and patterns of agrarian change but if those constructions were to change in the future, we would expect changes in the agrarian landscape.

Adnan (1985) studied certain key issues in the classical texts to show how these provide insights into and anticipate the controversies arising in the Indian debate. Equally it focuses upon those aspects of the South Asian experience which have thrown up certain anomalies requiring critical reformulation of the paradigm itself. The recent discussion on the mode of production in Indian agriculture drew upon the theoretical categories and arguments in the paradigm of capitalist development. This paper dwell upon certain key issues in the classical texts so as to show how these provide insights into, and in some cases anticipate, the controversies arising in the Indian debate. Equally it is to focus upon those aspects of the South Asian experience which have thrown up certain anomalies requiring critical reformulation of the paradigm itself. The paper indicated that the relationship between production and the market is by no means unproblematic, but varies in complex ways, in accordance with the relations of production. When it comes to exploring the systematic bases of capitalist transformation, both of them give insufficient weight to other barriers to capitalism which operated via the market, and the possibility of alternative historical outcomes. This results in disparate forms of market growth being equated to the development of capitalism, so that the process is perceived as unilinear and as a function of time. Such a critique applies as well to some of the con-temporary discussion in India.

Batterbury (2007) offers an overview of agrarian change and resource management in developing countries based on a case studies drawn from PRIPODE, which is a research programme funded by the French Government from 2002-2007 that supported teams of researchers in developing countries to explore population environment development interactions on a regional basis. The paper focus on three observable trends

such as diversification of livelihoods, intensification or dis-intensification of agricultural production, and changes in the political economy of agriculture, including new conditions of production brought about by factors that are largely external to the society in question. The argument of this overview is that it is impossible to separate out population environment relationships from other drivers of change most importantly the commoditization of agrarian systems and the increasing complexity of livelihood dynamics in the light of globalization, new risks, conflicts, and the profitability of particular agricultural and non agricultural activities. The paper concludes that it is important to consider all of these areas of research, if we are to inform better policies for rural producers in developing countries. Previous aid to small farmers, like "one size fits all" agricultural extension strategies and technology packages, never recognized diverse livelihoods, or sometimes discounted peoples' own histories as unimportant to the desired goal of productivism. Such efforts were bound to fail. The argument that population growth or decline influences livelihood decisions has some merit, as I have shown. But the link between population intensity and agriculture intensification, measured in terms of land use or labour input, is still unclear. That relationship is mediated through other factors, such as land availability, levels of available technology and the presence or absence of different exit options for rural households. As PRIPODE studies have shown, communities typically gravitate towards dual demand production to meet both subsistence and market, where such market possibilities are available. Farmers can alter production, migrate, or change their main livelihood activities, but few households abandon agricultural activities entirely.

Oommen (1971) summarised the prevailing explanation of agrarian conflicts and unrest in the countryside. The strategy of agricultural development adopted so far has been mainly production oriented and the problem of distributive justice has remained

unattended to the fruits of the green revolution are pocketed mainly by the rich and prosperous farmers and the disparity between them and the have-nots, particularly landless labourers, has increased; the increased disparity has led to a sense of deprivation among the weaker and poorer agrarian classes and their frustrations are manifest in agrarian tensions, occasionally leading to eruption and violence. The major factors involved in agrarian conflict, the author suggests, are perception of prevalent disparities in income by the rural poor, the strength of the agricultural labour force and its consciousness of its political bargaining power, the existence of an adequate support structure provided by the political parties, the rising aspirations of the rural masses and the increasing lack of fit between the socio political framework and the economic order.

Roy (2007) held that the slow growth of agricultural income has contributed to poor economic growth and poverty in India in modern times. The condition was weakened by Green Revolutions in the last third of the twentieth century. Conventional accounts attribute the stagnation to institutions created during colonial rule in India. This article suggests, instead, that it derived from an environmental constraint. The Green Revolutions succeeded partly because state aid enabled peasants to overcome the constraint in some regions. The paper argued that neither an institutional approach nor a productionist approach supplies an adequate account of the agrarian barrier in South Asia and how it was broken. The success of new technology was conditional on a traditional input and irrigation. The principal obstacle to agricultural growth was an environment induced market failure. Environmental constraints ensured that intensive agriculture needed resources that were too expensive and too unevenly distributed. The failures of policy were due to the fact that in many regions the agrarian barrier could not be overcome by these means.

Shah et. al. (2009) described how Semi arid Gujarat has clocked high and steady growth in agricultural state domestic product since 1999-2000 and argued what has driven this growth. They analyzed the drivers of Gujarat's agricultural growth through disaggregated analyses of performance of four distinct agrarian socio ecologies of Gujarat. They concluded that the Gujarat government has aggressively pursued an innovative agriculture development programme by liberalizing markets, inviting private capital, reinventing agricultural extension, improving roads and other infrastructure. Canal irrigated south and central Gujarat should have led Gujarat's agricultural rally. These could not have performed so well but for the improved availability of groundwater for irrigation. Arguably, mass based water harvesting and farm power reforms have helped energize Gujarat's agriculture.

Hairong and Yiyuan (2015) held that cooperatives, family farms and dragon head enterprises are emerging as new subjects of agriculture in China and are being promoted by the Chinese government as engines of agricultural development. Through case studies, they examined the dynamics of accumulation in Chinese agriculture, as well as the government's agriculture policy shift. They argued that capitalist dynamics exist in Chinese agricultural production and they come from above and below. They also argued that Chinese government's policy shift towards de-peasantisation began in the early years of the rural reform. The current dynamics of increasing capitalization of agriculture in China has been characterized by Philip Huang as Capitalization without Proletarianization.

Aydin (2010) analyses the relationship between the internationalization of agriculture under the hegemony of transnational corporations and the transformation of Turkish agriculture by specifically looking at the implementation of neo liberal policies in rural areas. It contends that neo-liberalism in Turkish agriculture since the 1980s

represents the abandonment of the nationalist project that underlined state policies in industry and agriculture between 1930 and the late 1970s. The paper also highlighted that those neo liberal policies implemented since 1980 have consolidated the stronghold of transnational agribusiness companies in Turkish agriculture. In cooperation with the World Bank, the EU and the WTO, the Turkish state has been preparing the necessary conditions for transnational agribusiness firms to control Turkish agriculture. Since 1999, the Turkish state has introduced fundamental institutional changes to ensure the smooth internationalization of Turkish agriculture, which has inevitably led to the impoverishment of the rural masses and to the abandonment of agriculture by small and medium sized households. Recent figures released by the Turkish Statistical Institute show that the expectation that increased liberalization of agriculture will lead to more efficient resource use through specialization and the improved use of technologies is far from realistic. As a result of the combination of rapid liberalization and adverse climate, the production of cereals, vegetables and fruit declined between 2006 and 2007. Being exposed to international competition does not necessarily make producers more efficient users of resources. Globalized agriculture has put all sorts of stringent quality specifications on internationally traded crops and most small producers have not been able to meet them due to their insufficient command over land, finances and knowledge. Deregulation in the agricultural sector has meant that rural producers have to compete in the global commodity markets with no or little help from the state and without much preparation for the transition. Having lost their access to productive resources such as inputs, credits and marketing facilities, and having been starved of state investments in agriculture, rural producers are not only losing their competitive edge but are also facing the danger of being unable to sustain their production.

2.3 Studies on Tribal Development

S. L. Rao et. al (2006) argued that tribal development strategies need to go beyond land based livelihoods and aim at emerging areas such as human capital, infrastructure, food security and employment generation. Positive discrimination has great potential but the policy still needs to be more inclusive. Empowerment of tribal women through self-help groups has shown the way in several locations. During the second-half of the 19th century, the British started an indirect rule in tribal tracts of the coastal districts through feudal intermediaries such as ‘zamindars’ and ‘muttadars’. Moneylending is among the earliest routes through which tribal land has been alienated in Andhra Pradesh. Non-tribal settlers advance petty cash to tribal taking tribal land as collateral. Loss of land has led to major changes in the livelihood pattern of tribal people. A major consequence is the growing number of agricultural laborers, an indication of the “depeasantization” process. The census data also shows that the proportion of agricultural laborers among the STs is on the rise. The alienated land cannot be restored because of legal loopholes, non retrospective land regulations, powerful outsiders and a continuing lack of political commitment to protecting tribal rights. Most non-tribal manages to hold on to their land by obtaining stay orders or producing false documents. So their studies suggest that Tribal development strategies, while respecting customary rights and tribal values, need to go beyond land-based activities. Human capital education and health in particular infrastructure, employment guarantee and food security are emerging as critical factors. Positive discrimination programmes have great potential to empower the STs.

Dipankar Gupta (1986) studied the Integrated Tribal Development Project (ITDP) in Birbhum District of West Bengal. It also discussed the incongruities in the ITDP administrative structure, the lack of control over resources, the complete absence of popular initiative, the non-involvement of popular bodies, and the complete failure of its

monitoring system. This study underscores the fact that developmental programmes which skirt around political issues have limited potentialities. The tribals were provided with lots of programmes designed for economic protection; programmes designed for economic uplift; programmes designed to involve tribals in the decision-making process and to promote popular participation; and programmes to further social service facilities to tribals in order to render both humanitarian service to them which was hitherto unavailable, and to overcome the handicaps the tribals face in terms of skills required to promote themselves economically in the contemporary world. But According to the sub-plan of West Bengal the tribal earners are encouraged to engage in agriculture, forest, and livestock. But the tribal still lived in poverty as they faced problem in irrigation, supply of raw materials, fertilizers etc. But it may be noted that the issue of alienation of tribal lands in the strict sense of the term does not arise in this region, as it does in Orissa, Bihar, and Madhya Pradesh because Birbhum's tribal population is composed entirely of migrants, though they are not recent migrants. The kind of initiative and programmes that are required in other states for the protection of tribal lands and forests are, therefore, not necessary here.

Goswami (1984) conceptualise tribe as a small, culturally distinct and economically self-sufficient community with a language of its own and an autonomous political organization is utterly inappropriate to the so-called tribal groups in India. Tribal, as a class, are viewed as poor, they are described as constituting the matrix of Indian poverty. The tribes of North Eastern Region may be divided broadly into hill dwelling and valley dwelling with distinct economic problems. He held that Tribal development which is purely a mere plan of economic development would be utterly inadequate to cater the needs of tribal as their problems are more basic and includes preservation of ethnic identity, ecology, language, culture, style of living, indigenous practices etc. Tribal

development has to be area specific because of the diverse situations. As they are geographically aloof they are usually deficient in infrastructural facilities. The tribes suffer from land alienation, landlessness, land fragmentation and outmoded agricultural practices. The author suggested for the strategy for tribal development which is area specific and household specific. Apart from infrastructural facilities like transport and communication, education, health and hygiene, irrigation etc, specific family oriented schemes will be more effective. However, utmost importance should be placed on the formation and development of local skills so that the tribal can diversify their occupations and partake increasingly of the benefits of national developmental measures.

Singh (1984) discussed the tribal problems, ways and means to tackle them. He investigates why the programmes of the government for tribal development were ineffective and slowly implemented examining the community development programmes of Bishunpur block in Bihar. He based on primary survey and concluded that the generation of income by utilizing local, natural and human resources was found to be absent, about 95 per cent of the population hardly gained any benefit from the programme, and the financial requirement of tribal forced them to dispose the scheme assets to the non-tribal of the area in the name of the developmental programmes.

Vidyarthi (1981) reviewed some of the works of anthropologists dealing with problems of tribal and development of tribal areas. The author held that the success of tribal development programmes is largely based on the approach of the official and non official agencies during implementation. Their understanding of tribal culture and traditions and appreciation of social, psychological and economic factors along with their intellectual while remembering the true objectives are important in the process of welfare and development of tribal. The services of anthropologists being utilized in governmental

agencies and their interest on tribal communities resulted in several works dealing with tribal problems, policies and implementation of development programmes for them.

Vargeshe (2010) analyse the social structure, issues and challenges of the Paniyas found in three states such as Karnataka, Tamil Nadu and Kerala. The study also highlights the socio-cultural and economic condition of the Paniyas and the social changes taking place among them in the context of modernization. Problems such as landlessness, health problem, educational backwardness, unhygienic surrounding, population issues, exploitations, water problems, indebtedness, alcoholism, family issues, child labour, social discrimination, etc have been identified. The author suggest that the paniyas must be provided a land with modern technological and scientific knowledge of cultivation to cultivate vegetables, crops and other commercial trees like rubber, cashew nut, coconut etc. to develop economically and socially. The author also suggested the government to provide employment opportunities as the main economy in handicraft has been taken over by industries. Lack of transport infrastructures and communication facilities also limit their access to development knowledge of rights and benefits which needs to be looked in to. Education and health are also needed by the community to develop. Besides, amenities like housing, water and also needs to be provided. The author suggested that all forms of direct involvement of the government is needed where developmental plan must be according to local context.

Toppo (1994) analyse five income generation schemes of the Jashpur Project of Raigarh district and also study the socio-economic conditions of target and non-target groups across schemes and blocks. Majority of the beneficiaries are agriculturalist. The author concludes that it is necessary that the programmes should be availed only to the target group so that the further income inequalities can be restrained. Grass root level approach to the selection of beneficiaries is needed for the successful implementation of

the programmes as the schemes have not reached the more vulnerable section of the tribal considerably. The author concludes that tribal society in the region demands a holistic approach to development problems. Therefore, the development of tribal is not merely implementation of work programmes but it involves social process to set in motion. It is necessary to introduce new technology with their consent and participation while preserving their native culture forms and environment.

Joseph (2004) evaluate the short comings and the challenges on the steps that have been taken by government and nongovernment agencies for development of the Malai Arayans tribal in Kerala. different parameters. Education, landholdings, employment, occupation and annual income of each family, nature of house building and availability of infrastructure facilities was studied to understand the situation. Unemployment and landlessness is the major problem identified among the Malai. In the mean time The Malai Arian has been progressing in education due to the work of Christian missionaries. Their progress in certain areas is mainly due to their own efforts and the government has done little in rehabilitating the Malai Arayans of the Kottayam district. So the author suggested that education must be reformed to empower the tribes. The selection criteria for welfare policy of the government should be based on financial status. Provisions must be made for the lowest stratum of the society. Various programmes for the tribal must be monitored properly for more effective functioning.

Varghese (2012) analyse the socio-economic development and its importance among the tribal in Sulthan Bathery teluk of Wayanad district of Kerala. The study highlight that self perceived needs of the tribal were limited to food, shelter, sex and clothing. Higher education, modern medicines and better transport and communication is beyond their imagination. Because of this awareness is low. Capital formation is almost absent and they completely lack in entrepreneurial skills. Market is available only in

villages and road site. Majority belongs to BPL and unemployment is prevalent. Housing condition, drinking water and sanitation facilities are also poor. Although government and non governmental agencies work to uplift the tribal in these areas many have not been covered. The human development index viz., life expectancy, per capita income etc. show lower status as compared to the non tribal in the area. In the light of the identified problems the author makes a policy suggestion where land alienation should be prevented. Restriction should be made on migration of non tribal in the areas and tribal culture and tradition should be protected. Education and employment opportunities must be provided to improve their socio-economic condition.

Hasnain, N. (1991) points out that the administrator must emphasize on the concept of development instead of welfare when it comes to policy. Welfare programmes are linked with the distribution of assistance which neglect the integrated growth and development of the tribal society leading conflicts and tension.

Romesh Singh (2003) examine the nature and implementation process of development programmes for tribals of Manipur and their socio-economic impact on the two selected village of Chandel district such as Khangshim village and Minou village during last five years and problems involved in their development. Agriculture mainly Jhum cultivation is the main occupation and beside this livestock rearing, handicraft, weaving, carpentry were the livelihood options available for the tribal. The author held that there is improper management of development activities. The two sample villages situated in plain and another one in hill. Villagers in the plain village have been obtaining more facilities such as irrigation, electricity, transport, market, and co-operative institutions whereas hill villagers have been deprived of such infrastructure facilities. The development schemes were implemented through various agencies for the tribal basically aim at bringing some positive changes by increasing the productivity and level of income

for beneficiaries. Efforts were made to minimize the existing gap between the tribal and non-tribal groups. However, these schemes failed to give positive impact among the tribal. This is largely due to the negligence, apathetic and biased attitude of both the government as well as the NGOs towards hill areas in the implementation of the developmental programmes. In the light of the highlighted problem the author suggested that peace in the region as the main key for development should be maintained as there is more need to enlist people's participation either by keeping this area under sixth schedule or strengthening ADC for a prosperous future of the tribal in Manipur.

Saikhia (2010) analyse innovation dynamics in shifting cultivation in Nagaland and its common association with the industrial modern societies and its dependence on fundamental scientific body of knowledge. Indigenous knowledge system of shifting cultivators in Nagaland is embedded in local, culture specific, holistic, tacit and integrative system of indigenous scientific knowledge. Two kinds of innovations are observed such as local innovations, and collaborative innovations. Local innovations are conceptualised and implemented by the local people themselves. The collaborative innovations, on the other hand, are often initiated and designed by various research organisations and governmental departments. In terms of tool use the use of rubber and iron were observed in place of bamboo and in the mean time the older versions of tools are not discarded. Innovation in crop selection influenced the farmers to select crops. Even in following the alder tree based 'Jhum' and 'Kolar Jhum' cultivation have been found to be effective in preventing soil erosion and enriching soil fertility. However collaborative innovations often have a disruptive effect on existing institutional structure. The main aim of this collaboration innovation is to integrate the community with market through promoting individual entrepreneurship, and cash cropping in 'Jhum'. These innovations introduce the element of modern scientific knowledge into the system and

replace 'Jhum' by terrace cultivation. The cases of organic farming and piggery entrepreneurship have been successful under collaborative innovation but the cases of Afforestation in 'Jhum' lands, and replacement of 'Jhum' by terrace/wet rice cultivations have not been quite successful. So the author concluded that government initiated collaborative efforts are not often in consonance with the existing institutional structure of these communities. Such efforts might lead to difficult adjustments in their cultural, social, and psychological spheres provisions were kept to accommodate the recurrence of past contingencies in future.

Singh. L. R. (1998) opined that the implementation of plans and programmes for the tribal development should be executed with the involvement of the tribal people themselves because this process will make them aware and develop consciousness about their role in development. It will change them and inspire confidence to live with others. Moreover, the author also concludes that the felt need which is an important key for development could be identified easily with the people who are actually involved.

Rizvi. B. R (1996) held that the problems of the tribal economy and culture are diverse and its development and solution of problems should be with a sympathetic understanding and based on firsthand knowledge of the tribal life and institutions. The author suggested that an attempt should be made to minimize the effects of change and transition and to solve the problems of adjustment and social conflict.

From the review of literature, it could be observed that there are a number of studies on shifting cultivation conducted in varied agrarian and tribal contexts. Social scientists especially the economists, sociologists, anthropologists, historians etc., have explored the agrarian question from their disciplinary angles and varied theoretical perspectives and methodological orientations. Among the theoretical approaches political economy is predominant while the quantitative approach is prominent methodological orientation. In spite of these, a few research gaps could be observed.

Firstly, there are some studies on shifting cultivation in the North East India (see *Shifting cultivation in North East India* (Roy et. al. 2015, Malabika DasGupta 1994, Ninan, 1989, Wadia 1980). These studies are not adequately focusing on the impact of transition to settled cultivation or the structural factors associated with such transformation.

Secondly, there are a few empirical studies on this problem in the context of Mizoram (see Sati and Rinawma 2014; Lalenzama & Kanagaraj 2013; Leblhuber, Kimi and Vanlalhruaia 2012; Lalenzama 2011; Zaitinvawra and Kanagaraj, 2008; Thangchungnunga 1997; Tawnenga et. al. 1996) at the household level. Even these studies have confined to a few villages in Aizawl district and there are no notable studies in other districts. The findings of these studies may not be reflecting the real situation in Mizoram as a whole.

Thirdly, a few studies focus on impact of transformation (switchover from shifting cultivation to settled agriculture) on agrarian structure (See except Lalenzama 2011; Zaitinvawra and Kanagaraj, 2008; Ninan, 1989). Even these studies could not demonstrate clearly the effect of agrarian change on the tribal development as they did not operationalize the concept of tribal development from theoretical perspectives.

Fourthly, social workers have not adequately focussed on tribal development i.e., tribal livelihood (except Kanagaraj 2014; Zaitinvawra and Kanagaraj, 2008) or living conditions (see; Lalenzama & Kanagaraj 2013; Lalenzama 2011; Kanagaraj, 2005).The present study tries to fill these gaps by comparison the tribal livelihood and living conditions of the shifting cultivators and settled agriculturalists.

The present chapter presented a review of literature on shifting cultivation, agrarian transformation and tribal development and identified the research gaps. In the light of these the next chapter presents the setting of the present study and methodological aspects of the present study.

CHAPTER III

METHODOLOGY

In the previous chapter, the review of literature and research gaps was presented. In this chapter the methodological aspects of the present study are presented.

A sound methodology is vital for any research; it is the heartbeat of research whether educational or scientific, which would lead the researcher to achieve the objectives. To obtain credible inference, it is crucial to select the sample of a study methodologically, select or conduct tools scientifically, collect data through reliable and valid tools, analyse data systemically and draw conclusion carefully. Thus, the success of research depends largely upon the method and techniques that are adopted by the researcher. Further, the methodological conceptual and operational framework needs to be developed to suit the local context. The present chapters aim to accomplish these.

This chapter has been presented in two major sections viz., the setting and methodological aspect of the present study. The first section that is the settings includes the profile of the study area. The second section that is methodological aspect includes research design, sampling, and tools of data collection, data processing and analysis, concept and operational definitions and limitations of the present study.

3.1 The Setting: Profile of the Study Area

The setting of the present study includes the state of Mizoram, Lunglei District and the sample villages. The New Land Use Policy is also highlighted.

3.1.1 The State of Mizoram

According to traditional source the Mizos came out of a very big stone called ‘Sinlung’ variantly ‘*Chhinlung*’. In modern scientific age it is hard to believe that a man came out of hole in a stone. There had been wide speculation regarding the location of

‘Chhinlung’ which could be identified with the Chinese city of Xinlong situated in the Szechwan province of China beside the western side of Yulung River and on the east of the Yantze Kiang river. Some sections of the Mizos however think that they are the descendants of the lost tribe of Israel in the house of Ephraim. But the majority felt that the case is not a proven fact and nothing can be gained by such claim (Sangkima 1992).

Historians believe that the Mizos are a part of the Mongolian race spilling over into the eastern and southern India centuries ago. They came under the influence of the British and Christian missionaries in the 19th century and now most of the Mizos are Christian. One of the beneficial results was the spread of education. The Christian missionaries introduced roman script for the Mizo language and formal education (Zaitinvawra and Kangaraj, 2012).

The term ‘Zo’ accommodates all tribes of the zo ethnic group. It is broadly divided into two main linguistic groups. A group that finds it difficult to pronounce ‘R’ are Lusei, Hmar, Ralte, Lai, Mara, Rangkhoh, Darlong, Khawibu, Biete, Bawm, Pang, Maring, Aimol, Kom, Chiru, Lamkang, Moyon, and Monsang. The groups that difficult to pronounce ‘G’ are Thadou-Kuki, Paite, Tiddim-chin, Gangte, Zou, Simte and vaiphei. When ZORO was founded on 18th May 1988 at Champhai, it proposed a name called ‘Zo’ to accommodate the zo ethnic group (Jangkhongam Dounjel).

The term ‘Mizo’ is a generic term and as such the different tribes or clans who inhabit the entire perimeter of the present Mizoram and whose culture, traditions, dialect etc. are similar are commonly designated by the term “Mizo”. They may be broadly classified into two groups. The first group consists of the Lusei, Hmar, Ralte, Chawngthu, Pawi, Khawhling, Khiangte, Chawhte, Ngente, Renthlei, Tlau, Pautu, Rawite, Zongte, Vangchhia, Punte, Paite, FanaiPawi, Thlado, Lakher, Pangkhua and Mawk. They inhabit the northern and middle part of Mizoram. The second group is formed by the Pawi and

Lakher with their different sub clan who are concentrated in the south and the south eastern parts of Mizoram bordering Burma.

Mizoram formerly known as the Lushai Hills was occupied by the British in 1890 and was administered from Aizawl Headquarter. It was elevated to a status of an Autonomous District Council in 1952. The North Eastern Reorganization Act of 1971 granted a status of Union Territory under its present name, Mizoram and got statehood on 20th February, 1987. The name of the state is a combination of two words '*mizo*' and '*ram*'. The word '*ram*' means country or land, thus Mizoram means a land of the Mizos.

Mizoram covers an area of 21,081 Sq. Km and located between 21° 58' and 24° 35' North latitude and 92° 15' East and 93° 29' East longitudes. Mizoram is 277 km long from north to south and 121 km wide from west to East and has 8 Districts (Mizoram Statistical Handbook 2010). It is bounded on the north by Cachar District of Assam and with state of Manipur on the north east, on the east by Manipur state and Burma and South by Burma and Bangladesh and on the west by Bangladesh.

Mizoram has a rugged mountain terrain and most of them are from north to south directions. Generally Mizoram consist of primarily sand stone and shale which are laid down in deltas and river banks and no valuable mineral deposits have been discovered in Mizoram. Most of the rivers flows north south direction and River Tlawng is the longest river in Mizoram. The rivers are fed by monsoon rains and many of them are dried up during winter. The entire area received south west monsoon wind and the average rainfall reach 254 cm per annum. The average height of the mountain ranges is 900 meters. The temperature varies from 11° C to 24° in the winter and 18° C to 29° C in summer.

Mizoram enjoys rich biodiversity. It is one amongst the mega biodiversity hotspots of the world. Natural vegetation comprises of tropical evergreen in the lower altitudes and semi-evergreen on the upper slopes (Champion & Seth, 1968). About

90.68% of the State's total geographical area is covered under forests. The land is rich in natural resources and the state has 130 Square Km very dense forest, Moderate Dense Forest 5841 Square km and 12,960 Square km of open forests (India State of Forest Report, 2013). At present, notified forests (reserved/protected forests) constitute about 38% of the geographical area and even most of these are open, degraded and subject to pressure of shifting cultivation, encroachments, fire, illicit felling etc. Mizoram has abundant natural bamboo resources which cover 31% (6446 sq km) of its geographical area and as many as 35 species of bamboo have been identified in the State. Currently the total crop area in Mizoram is 132,634,000 hectare which is 6.28% of the total area of Mizoram (Mizoram 2014).

As per 2011 census, the total population of Mizoram is 10,97,206 with growth rate of 23.40 per cent over 2001 census and 2,22,853 households. From the total population 44.36% i.e. 4,86,705 were workers and the rest 6,10,501 (52.83%) were non-workers and 47.17% of the total workers are engaged in agricultural activities. Out of the total population that is 1,036,115 persons that is 94.43% belongs to scheduled tribes. Mizos form a close knit society and one of the notable features of the Mizo society is of the so called '*Tlawmngaihna*' which means altruistic service. It stands for a compelling moral force which is expressed in self sacrifice for others.

The sex ratio is 976 females per 1000 males. About 94.48% of the state population belongs to Scheduled Tribe and Scheduled Caste population comprises about 0.11% of the State's population. The State economy (GSDP) is projected to grow at about 8.58% during 2013-14 while the national economy (GDP) is projected to grow at 4.9% during 2013-14. The Per capita income of Mizoram for the year 2012-2013 is estimated at Rs 60,836 and tertiary/Service sector constitute a share of about 60% of the total GSDP which indicates that this sector drives the economy of Mizoram. Both the industry sector

contributes about 17% and the agriculture & allied sector contribute about 19% to the GSDP respectively. About 60% of the population depends upon agriculture and allied sector. Share of Agriculture and Allied sector to the economy during the 11th Plan period could be averaged at 14 %. About 32 % of the cultivated area is under Jhum cultivation. Only 31.60 % of the demand for rice that is a total of 1,70,931.80 tons could be met within the State during 2012-13. The existing area under various horticulture crops accounts for 1.21 lakhs hectare which is only about 10.46% of the estimated potential area of 11.56 lakhs hectare.

There are 370 Health Sub Centres, 57 PHCs and 12 CHCs. About 25.2% of children (0-3yrs) are malnourished. The Infant Mortality rate (IMR) on 2009 stood at 33.67 per 1000 while it is 33 per 1000 based on 2008.

3.1.2 Lunglei District

Lunglei District is one of the districts of Mizoram, occupying more or less the central part of Mizoram which is 175 km south of Aizawl via Thenzawl road and located between 22.18 and 23.18 North Latitude and 92.15 and 93.10 East Longitude, extending more to the southern side. The area of Lunglei district is 4538 Square Km and the density of population is 36 people per square km. It is bounded on the north- west by Mamit District, on the north-east by Serchhip District, on the south by Lawngtlai District, on the southeast by Saiha District. It shares international borders with Myanmar on the east and Bangladesh on the west. The average elevation of the district is 722 mts (2369 ft). The district dense forest area cover is 524.63 sq. Kms. It has Humid tropical climate with 2566mm average annual rainfall. The numbers of household is 27995 with 161 villages and 3 notified towns. The Lunglei district is divided into four Rural Development Block namely Lunglei Block, Lungsen Block, Tuipang Block and Hnahthial Block.

According to 2011 Census, Lunglei District has a population of 161,428 of which male and female were 82,891 and 78,537 respectively. Lunglei District population constituted 14.71 percent of Mizoram's total population. In the population of Lunglei, 42.59 percent that is 68,752 people lives in urban areas where males constitute 35,314 and females are 33,438. 57. Forty-one percent of the district population that is 92,676 of live in rural areas and males and females are 47,577 and 45,099 respectively. Lunglei District has a working population of 78,292 and have the highest growth in number of cultivators in Mizoram as compared to 2001 census which constitute 45,439 (58.03%) and 13.61% agricultural labourer out of the total working population, the rest 1.03% were workers in household industries and other workers constitute 27.33%. Agriculture happens to be the main source of state income (SGDP). But only about 18.17 percent of the total SGDP comes from agriculture and its allied sectors (BSNER 2015).

Average literacy rate is 88.86 constituting 121,122 where male and female literacy were 92.04 (64,515 People) and 85.49 (56,607 People) respectively. Sex Ratio in Lunglei stood at 947 per 1000 male while the average national sex ratio in India is 940 and child sex ratio is 963 girls per 1000 boys.

3.1.3 Profile of Sample Villages

The sample villages are classified into shifting cultivator villages and settled agriculture villages. Muallianpui and Leite are shifting cultivator villages and Tawipui South and Lungsen are settled agriculture village. Muallianpui and Lungsen represent the villages located far away from the district headquarters and Leite and Tawipui South represent the villages located near the district headquarter.

Muallianpui Village

Muallianpui Village is a shifting cultivator village and situated in the northern side of Mizoram. It is situated in the southern mountainous region of *Phawngpui* which is the highest mountain of Mizoram. It was established on 1861-1964 when 30 families along with their chief, Nochhuma made their settlement in the present place. After sometime, the number of households reached 300. The settlement of the village is almost 3 (Three) Kilometers and because of this the name Muallianpui is given. The name *Muallianpui* means 'a big field'.

In 1887 when the British entered Mizoram (known as '*Vailen*'), Darbilhi, the wife of Nochhuma took the place of her husband and even took control of the the neighbouring villages such as Lungleng and Lungpuitlang as an agreement was made with Captain J. Shakespear (also known as Tarmita) who is the Bawrhsap (Deputy Commissioner) for southern Mizoram. As Christianity came, the church was established in 1912. Muallianpui is a mixture of two sub-clans. When insurgency broke out in Mizoram, Muallianpui village was grouped along with other villages to Vanlaiphai South. After sometime, a few of them went back to the present place. Majority of the sub clan belongs to *Pawih* and *Hmar*. The village is surrounded by thick forests where cultivation is one of the biggest advantages for the villagers. Presently Cultivation is still the dominant occupation in Muallianpui Village.

Muallianpui is situated in the southern side of Mizoram which is nearly 120 Kilometers from Lunglei crossing one of the biggest rivers that is Chhimtuipui River. It is presently 213 households. There are 43 families belonging to Below Poverty Line and 42 families under AAY. The population is 1253 where 591 are male and 663 are female. The strength of female is higher in the proportion. 186 households are with electric connection and there is no water connection available in the village. It is observed that connections

are prepared and they hope to get the water connection soon. Only 164 households have septic tank and the rest 99 households use pit latrine. There are 3 denominations in the village with 4 local churches such as Baptist Church of Mizoram, United Pentecostal Church (North East) and Seventh day Adventist. Baptist Church of Mizoram has the largest members. There are 2 (two) primary schools, 1 (one) middle school, 1 (one) high school and all these schools are government school and private school is absent. Higher educational institution is absent and the nearest institution is in South Vanlaiphai which is more than 12 Kilometers on un-metal road. There are 5 (five) Anganwadi centers and 1 (one) sub-center.

The occupation of the households is mainly agriculture. About 40 households depend on shifting cultivation and 50 households practice settled agriculture. 50 households depend on both shifting cultivation and settled agriculture. There are 113 households benefit from New Land Used Policy till the third phase. The trades selected under the New Land Used Policy are Orange, Coffee, Tea, Pineapple, Carpentry, Piggery and Fishery. Most of the trade links to agriculture. The criteria used for the selection of beneficiaries mainly are the membership to congress party as they are selected by the congress unit in the village which is observed from the key informant interview. There are three main Non Governmental Organisations in the village mainly the Young Mizo Association (YMA), *Mizo Hmeichhe Insuihkhawm Pawl* (MHIP), *Mizo Upa Pawl* (MUP). Young Mizo Association (YMA) is the organisation of the youth, it have the largest membership even in the whole Mizoram. There are two YMA Branch which are Chhimveng and Hmar Veng YMA branch which are established in the year 1974 and 1973 respectively. Currently the branches have 200 and 65 members respectively. The main aim of the existence of the organisation is to help the needy and to uplift mizo nationalism. *Mizo Hmeichhe Insuihkhawm Pawl* (MHIP) is an organisation of women.

There are two branches of MHIP viz., North branch and south branch established in the year 1982 and 1984 respectively which is mainly for welfare of women and women empowerment. The members are 226 and 30 respectively. Mizo Upa Pawl (MUP) is an organisation of the elderly established in the year 1978 for the welfare and protection of elderly. Currently there are 63 members. Beside these political parties also function effectively in the community.

The main activity in the village is connected and confined to agriculture (see Figure 3.3.2). January and February are used for clearing of forest and land preparation. Even fishing is also one important occupational activity as the village have small stream in their land which serve a source of income for the farmers beside cultivation. In the month of March while the shifting cultivator wait for the cleared forest to dry for burning the settled agriculturalist sow seeds and plant seedling in their field. This paved way for the farmers to practice both the method of farming. Rice are shown in the month of April and May and seeds of different crops are shown followed by weeding process in the same month in both the farming method as this is the best time for weeding as the grass died easily in this season. In June, July and August the cultivators are mainly busy with weeding as it is a rainy season and most labour employment in the field is also taking place in this season. Vegetables like leaf crops and fruits could be harvested in the fields which provide food for the farmers as well as income to the households. Although weeding process has to be undertaken almost the whole season, the needed effort is lesser in the month of September and October which enable the farmers to engage in other economic activities such as fishing, hunting crabs, collecting forest products and even involvement in community service like church service is also more frequent than the other months except Christmas season in December. November and December is mainly time for harvesting crops and land preparation for the settled agriculturalist for the next

year. Winter crops are also sown and looked after. Football tournament is the only recreational activity mentioned in the diagram which usually falls in the times where the activity in the field is less, usually in the months of May and December.

Spatial Organisation of Muallianpui Village

Social Mapping was conducted on Dt. 8th January, 2015 with 5 members where most of them are leaders and elders (see Figure 3.3.1) to understand the resource features of the village.

Muallianpui village is not a very big village where most of the settlements are concentrated in one hill. The settlement is around 1 km long and settlement is found only near the main road. The main occupation of the village is cultivation and recent house listing shows that settled agriculture though dominated the occupation many of them still practice shifting cultivation where most of the crops are cash crops. The village is not connected by metal road and as it is situated near the border with Myanmar the village is not connected by other transportation. There is no market for selling their products as vehicle passing through the village is almost absent. Most of the products are sold in their village to commissioner but the prices cannot be high like other places as transportation cost is high. Moreover the nearest village South Vanlaiphai is also separated by River Tuipui D and only light vehicle carried by engine run Boat could pass through which makes the transportation cost higher.

In terms of land ownership, most of the lands near the village are owned by private for cultivation and the community land is shrinking. Most of the land are privatized and were given to farmers for cultivation through the programme of NLUP but land is still abundantly available as the population is still less and the Village Council also gave a portion of its land for NLUP beneficiaries and called it NLUP land. The ownership of land from outside is absent as it is far from towns and cities. The village owns a forest

reserved area which indicates that the farmers are aware of the consequences of deforestation and the importance of ecology. The map shows that sport infrastructure is less for the youth. Most of the youth are engaged in cultivation and help their families. Although the process of urbanization in the neighbouring villages also impacts the life of the people in many ways, the tools, input use and techniques of agriculture were not developed as most of the households lack capital, training, awareness and supply of materials etc. But the agricultural system is also upgraded in some ways in terms of manure, pesticides and seeds used but the supply is not regular which discourage the farmers to depend on it. Growing of cash crops emerged in the village which shows their readiness to switch over to settled cultivation and they are in a transition period. Cultivation of fruits and vegetables is higher as compared to other crops such as cereals and tree crops. Fruits and vegetables are mainly cultivated as market opportunities are available and even if productions are less and marketing could be done easily as commissioners are available at village but they are not in control of the price of the products. The dependency on forest is still very high in terms of fuel, food and timber. Most of the crops are selected according to the interest of the farmers and also based on the help available from the government. The selection of crops is also influenced by neighbours. Transition from the shifting cultivation to settled agriculture occurs at a very fast rate in the recent years which is mainly due to the implementation of NLUP by the Mizoram government. Although the farming areas increase, they are not linked by roads which block the improvement of farming areas and in terms of input.

Infrastructure, Amenities and Facilities in Muallianpui: Services and Opportunities

A Services and opportunities mapping was conducted during the fieldwork to understand the availability and accessibility of resources by the villagers (see Figure 3.3.3). From the resource map, it is very clear that many resources are unavailable for the

villagers. Especially the agricultural amenities like tools for land preparation, irrigation, weeding machine and also processing equipment for products. Marketing opportunities are little as even the nearest market is 12 kms away from the village. Facilities in health, infrastructural development is out of reach for the villagers. The employment of machine is also absent in the village may be because of lack of capital and the location of the village. The transition towards settled cultivation is high but the cash crops are grown in Jhum land which clearly indicated that they do not have enough capital to run sedentary form of cultivation with their own capital. Forest department and health department are the only Government departments in the village but that is also nominal and without proper workers. The Block headquarter which is in Hnahthial is also more than 80 km from the village which makes the villagers aloof about different kinds of opportunities and even for training in agriculture, they have to travel more than 80 km which is always difficult for them.

Transport is one of the greatest challenges faced by the villages. Muallianpui village is the only sample village in the present study which is not connected by metal road, making transportation costs higher. Even though public transport like sumo service is available, the roads have not been maintained by the government for a long time which adversely affects the marketing of the products from the villages. It is almost impossible to transport products especially during rainy season.

Lungsen Village

Lungsen village is a settled agricultural village and was established in 1860 but the date is still unknown and debated till today. The place where it was first established was at the outskirts of the present place. The meaning of Lungsen is a combination of two Mizo word '*Lung*' which means stone and '*Sen*' which means red. So Lungsen means Village of Red stone. The reason of giving the name Lungsen is also not recorded

properly and verbally there are two reasons. One is that when the villagers tried to dig a spring well, the stones and soil were so red therefore its name. The other reason is that almost all the sand and rock of Lungsen village is red and because of this the name Lungsen is given.

Lungsen Village is one of the oldest villages which still exist today. The village was shifted to the present place in 1890-1900. The reason of shifting is mainly due to the death of many villagers due to disease and till today it was named '*Thihzawhna Veng*' which means a place where everyone died. The village is an important place as the British camped in its premises even before and after World War I. The first chief of the village could be known is Rothangpuia. In 1861 Rothangpuia attacked Tripura and killed almost two hundred of the people. He also brought 100 slaves and because of this the village was burned by the British. Rothangpuia was defeated and he continued to serve them. Even Mary Winchester (Zoluti) was returned by Rothangpuia to Tom Herbert Lewin. Rothangpuia was replaced by his son Lalcheuva. When chieftainship was abolished in 1954, village council was established and during that Lungsen village comprised of about 60 households. A road that linked Lunglei and Tlabung via Lungsen was made in 1889. When insurgency broke out, Lungsen became a centre of grouping and many people settled till today.

Lungsen village is presently 619 households with a population of 2342 and has 1171 male and 1171 female. It is situated in the western part of Lunglei which is around 58 km from Lunglei. There are 156 households belonging to Below Poverty Line, 90 household belonging to AAY and the rest 373 household belongs to Above Poverty Line. Almost the entire house in the village has electric connections which constitute 600 households and 343 households have water connection and 65 cluster point. Spring well is also available in the community. 614 households have septic tank and only 5

households use pit latrine. There are five church denominations which are Baptist, Presbyterian, UPC (North East), UPC (Mizoram) and Isua Krista Kohhran. Baptist Church of Mizoram constitutes three churches and has the largest members comprising 315 households with 1356 members. The Presbyterian have one church with 120 members, the United Pentecostal Church (North East) has two church comprising 462 members, United Pentecostal Church (Mizoram) has one church and comprises 126 members, Isua Krista Kohhran has 150 members. There are two (2) Government Primary Schools, two (2) Government Middle Schools and one Government High School. There is also one Private run school which is joint middle and Primary School. There are also certain government departments in the village such as eleven (11) Anganwadi Centres, one (1) public health centre, and one (1) health sub-center. There are around 46 Self Help Groups in the community.

In terms of occupation, 205 households approximately practice settled agriculture and use them for their primary source of income and household around 150 household still practice shifting cultivation and 130 household practice both shifting cultivation and settled agriculture. 384 person received assistance under New Land Used Policy till the fourth phase. This clearly indicates that most of the household receive assistance under New Land Used Policy. Mainly, the trades selected under New Land Used Policy which are related to agriculture are Pineapple, broom, oil palm, oranges, Hatkora, Nimbu and Wet Rice Cultivation-II. The non-agricultural trade some of them were also animal husbandry, petty shop, carpentry, tailoring and fishery. The mode of selection of beneficiaries is mainly by the village council and the congress unit in the village. The criteria of selection of beneficiaries are mainly based on the membership of congress and the relatives of the village council and the congress unit in the village which is observed from the key informant interview.

There are three main Non Governmental Organisations in the village mainly the Young Mizo Association (YMA), Mizo Hmeichhe Insuihkhawm Pawl (MHIP), Mizo Upa Pawl (MUP). Young Mizo Association (YMA) is the organisation of the youth and has the largest membership even in the whole Mizoram. There are three (3) YMA branch in the village namely the Lungsen South Branch, Lungsen North Branch and Lungsen Venglai Branch. Lungsen South Branch is established in the year 6th January, 1974 and currently having 555 members. Lungsen North Branch is established in the year 30th September, 1937 and currently having 340 members. Lungsen Venglai Branch is established in the year 1st February, 1997 and currently having 210 members. The main aim of the existence of the organisation is to help the needy and to uplift mizo nationalism. Mizo Hmeichhe Insuihkhawm Pawl (MHIP) is an organisation of women established mainly for welfare of women and women empowerment, before the MHIP Branch is one branch and it was distributed into three branches. There are three branches in Lungsen namely Lungsen South Branch, Lungsen North Branch and Lungsen Venglai Branch. Lungsen South Branch is established in the year 29th January, 1999 and currently having 235 members, Lungsen North Branch is established in the year 29th January 1999 and currently having 147 members and Lungsen Venglai Branch is established in the year 29th January 1999 and currently having 94 members. Mizo Upa Pawl (MUP) is an organisation of the elderly established in the year 1977 for the welfare and protection of elderly and currently there are 170 members. There are other small organisations such as self help groups, consumer association, organisation of students etc. Political party also functions effectively in the community.

The main activity in the village is connected and confined to settled agriculture although a trace of shifting cultivation could be observed (see Figure 3.4.2). January and February are used for clearing of forest and land preparation. Although the activities

require lots of efforts it could be finished in short time giving the farmers time to engage in other economic activities. February is often called '*chapchar awllen*' where vegetation in the cleared field by the shifting cultivators are let dry for burning and the time is also used for land preparation for the settled agriculturalist and fishing is also one important occupational activity. The month of March is embedded with lots of activities where one of the important festivals connected to Jhum - '*Chapchar Kut*' is celebrated and later in the month, the fields are burned and seeds are sown. Rice starts sprouting in the month of April and May which is followed by weeding as this is the best time for weeding as the grass dies easily in this season. June, July and August are rainy seasons and the weeds grow fast and the cultivators are busy with weeding. Labour employment in the field is also more in this season. Different crops which produce leaves could be harvested from the field providing food for the farmers as well as income to the households. Although weeding process have to be under taken almost the whole season, the needed efforts is more in the rainy season which force the farmers to engage more in their field and labour employment opportunities is also higher for labourer. Other economic activities which are not agricultural related such as fishing, hunting crabs, collecting firewood, collecting forest products etc. are also going on carried out by non agricultural households. Collecting forest products and involvement in community service like church service is also more frequent than the other months in September except Christmas season in December. November and December is mainly time for harvesting crops like rice, pumpkin, beans, roots, oilseeds etc. Winter crops are also sown and looked after. Recreational activity mentioned in the diagram like sports could be observed in this season where the activity in the field is less for farmers usually in the months of May and December.

Spatial Organisation of Lungsen Village

Social Mapping was conducted on Dt. 20th January, 2015 with 4 members of villagers (see Figure 3.4.1). The village situated along the road to Tlabung which is around 60 km from Lunglei. The Social map of Lungsen shows that the village is an old village approximately 1.5 km long and 1 km wide with a vast cultivated land around it. The main occupation of the village is cultivation and recent house listing shows that settled agriculture dominated the household occupation and non-agricultural occupation is also more as compared to other sample villages. Most of the settlement is away from the main road and small metal link road connect every part of the village. The schools, community hall, Health sub-centre, Public Health Centre, and other government departments were evenly situated in all the areas and were not confined to one place. As the village is situated along the road, vehicles stop by, creating employment opportunities for villagers. Most of the commercial places such as Hotels, vehicle workshops, tea stalls and shops are situated mainly along the road side and carpentry workshop also situated within the village mainly attached to their houses. The availability of market provides an opportunity for selling the products such as fruits and vegetables which triggered the cultivation of cash crops and further led to the transformation from shifting cultivation to settled agriculture. Besides this, the village is near to Lunglei the second capital and international border with Bangladesh that is Tlabung which provide better market opportunities for the farmers. The introduction of settled agriculture started a long time back mainly triggered by the availability of market but the markets are not systematized till today. In terms of land ownership, most of the lands near the road site are owned by private for cultivation and the community land is shrinking. Most of the land are privatized and were given to farmer for cultivation through the programme of NLUP. Some of the lands are reserved for beneficiaries of NLUP. Ownership of land from

outside is observed and even locally the transfer is mainly to the rich from the poorer household. The map shows that sports infrastructure is sufficient for the youth and the level of engagement is also high and in the mean time, most of the youth are engaged in cultivation and help their families. The process of urbanization in the village also impacts the life of the cultivators in many ways but the tools, input use and technique of agriculture were not highly developed as most of the households lack awareness and proper training. Moreover, the expenditure could not be high for cultivation as there is no security in marketing as prices are not stable. Besides, there is no insurance system for the farmers in case of crop failure. Fruit cultivation emerged significantly as market opportunities are available even when production is less. Marketing could be done easily as commissioners are available in the village. But the prices could not be fixed by the cultivators. Oil palm growing emerged among the farmers under the surveillance of Ruchi Soya Industries Limited and the government make contract so that all the products will be purchased by the company. Even the first products were also purchased by the company. The dependency on forest is lesser among the cultivators. Most of the crops are selected according to the interest of the farmers and also based on the help available from the government. Sometimes the government introduces crops like oil palm to the farmers resulting in the diversification of crop selection. Transition from the shifting cultivation occurred a long time ago and it occurred at a very fast rate in the recent years which is mainly due to the implementation of NLUP by the Mizoram government. But most of the lands are not linked by roads and electricity which hamper the development of farming areas and in terms of input and employment of machines for terracing and irrigation.

Infrastructure, Amenities and Facilities in Muallianpui: Services and Opportunities

Services and opportunities map of Lungsen village was prepared with the villagers during fieldwork (see Figure 3.4.3). Lungsen is more of a sub-town with a population of

2,342 persons and 619 households. The services for the villagers are situated around the village. Lungsen is the block headquarters and because of this the village has the best facilities and services among the sample villages of the present study. The PHC, Police Station, PWD Office, Forest Department, Block Development office, Sport Complex, Ruchi Soya Office, Health Sub-Centre, Anganwadi and Child Development Office stayed within a radius of 3 km from the center of the village. The availability of these facilities is reflected in the cultivation as many successful settled agriculturalists could be observed in the village. As facilities are easily available in the village the economic activity beyond agriculture is also more as compared to other sample villages. Private sector employments in carpentry, restaurant, tailoring, labour etc. are more. Transition towards settled agriculture was started long time over many decades which might be the causes of development in the village. Although other sector of employment is less people can depend on agriculture as a source of livelihood where shifting cultivation is almost absent. As the village is situated between Lunglei and Tlabung which is the border to Bangladesh, lots of marketing opportunities are available but not systematized.

Although the national highway passes through the village, the roads are very bad as they have not been maintained by the government for a long time which raise the cost of transport and affects the marketing of the products from the villages. The community is a big village where most of the household income is from agriculture. Most of the households owned land for cultivation.

Tawipui South Village

Tawipui South is a settled agricultural village and it is one of the village that is set up before insurgency in Mizoram. It is situated along the National Highway 54 which is 55km from Lunglei towards Lawngtlai. The village was set up by Chief Dokhara who came to the present place from Denlung, Hnahtial in 30th March 1898. The name of the

village was named after a big Banyan tree which was situated in the hill of the village. Dokhara the chief of Tawipui took the permission from the Lunglei Superintendent Captain JW. Shakespear and set up a village. In 1919 the village was shifted to the southern side which is the now called Minpui and Christianity reached Tawipui during this time and even church was set up by Mr Chaltuaia in the same year. In 1925 Aichhuma already took the charge from his father Dokhara. In 1946 Middle School was set up and in 1952 Village Council was also set up. The middle school was upgraded to high school in 1969. Now Tawipui is extending to the northern side and also southern side. Presently the northern side is called Tawipui North and the southern side is called Minpui Veng. The Village is mainly scattered along the road site.

The village of Tawipui South is presently 317 household with a population of 1500. The population has 850 men and 650 women. There are 117 households belonging to Below Poverty Line and 40 household belonging to AAY. The entire house in the village has electric connection whereas only 116 have water connection. This is because the village has a spring well which supplies the community throughout the year. 175 households have septic tank and the rest 142 household still use pit latrine. There are two church denominations, Baptist and Presbyterian. Baptist Church of Mizoram has the largest members. There are four (4) primary schools and among them is private run primary school. The village also has one (1) middle school and one (1) high school which is run by the government. There is no higher educational institution in the village and the nearest higher educational institution is more than 20 km away. There are also certain government departments in the village such as four (4) anganwadi centres, one (1) public health centre, and one (1) health sub-center.

In terms of occupation, 150 households approximately practice settled agriculture and use them for their primary source of income. Only few households (10) still practice

shifting cultivation. 320 person received help under New Land Used Policy till the third phase. This indicates that more than one person in one household receive help under New Land Used Policy. Mainly, the trades selected under New Land Used Policy which are related to agriculture are Pineapple, broom, oil palm, orange and Wet Rice Cultivation-II. The non-agricultural trade some of them were also animal husbandry, petty shop, carpentry, tailoring and fishery. The mode of selection of beneficiaries is mainly by the village council and the congress unit in the village. The criteria of selection of beneficiaries are mainly based on the membership of congress and the relatives of the village council and the congress unit in the village which is observed from the key informant interview.

There are three main Non Governmental Organisations in the village namely, the Young Mizo Association (YMA), Mizo Hmeichhe Insuihkhawm Pawl (MHIP), Mizo Upa Pawl (MUP). Young Mizo Association (YMA) is the organisation of the youth, it have the largest membership even in the whole Mizoram. There are three (3) YMA branch in the village namely the Minpui Branch, Tawipui South Branch and Mt. Hermon Branch. Minpui Branch is established in the year 14th February 1950 and currently having 185 members. Tawipui South Branch is established in the year 4th September 1975 and currently having 220 members. Mt. Hermon Branch is established in the year 1st November 1984 and currently comprises of 51 members. The YMA Branch was established in the year 1954 and currently has 450 members. The main aim of the existence of the oranisation is to help the needy and to uplift mizo nationalism. Mizo HmeichheInsuihkhawm Pawl (MHIP) is an organisation of women established in the year 1985 mainly for welfare of women and women empowerment. Currently there are 280 members. Mizo Upa Pawl (MUP) is an organisation of the elderly established in the year 2000 for the welfare and protection of elderly. Currently there are 120 members. There

are other small organisations such as self help groups, consumer association, organisation of students etc. Political parties also functions effectively in the community.

The rate of development in infrastructure is not very high in Tawipui village where even the government buildings are old and in need of repair. Although the national highway passes through the village, the roads were very bad as they are not maintained by the government which raise the cost of transportation and affects the marketing of products from the villages.

The main activity in the village is related to agriculture although a little trace of shifting cultivation could be observed (see Figure 3.5.2). The seasonal diagram shows that January and February are used for clearing of forest and land preparation. February is often called ‘chapchar awl len’ where vegetation in the cleared field by the shifting cultivators are let dry for burning and the time is also used for land preparation for the settled agriculturalist and collection of firewood for the coming rainy season is also one important occupational activity. One of the important festivals connected to Jhum that is ‘Chapchar Kut’ falls in the month of March and this month is embedded with many agricultural activities. The fields are burned and seeds are sowed in the later month. One of the activities is building hut in the field. Rice is shown in the month of April and May and certain crops are also planted by the settled agriculturalist such as Banana, Pineapple and Ginger. This month is the best time for weeding as the grass died easily in this season and it is needed to be done because of the requirements also. June, July and August is a rainy season and the weeds grow fast and the cultivators are mainly busy with weeding. Pineapple is harvested in the month of August. Collection of Bamboo shoots from the forest is also carried out in these months. Labour employment in the field is also more in these months. Vegetables and some leaf drops could be harvested providing income for the farmers and the expenditure on food by the tribal households also decreased as food

was provided from field which was observed during the fieldwork. Although weeding process take place in almost the whole season efforts is needed more in the rainy season and labour employment opportunities is also higher for labourers. Rice is harvested at the end of September and October along with other crops and citrus fruits cultivated in a settled land. Other economic activities which are not agricultural related such as fishing, hunting crabs, collecting firewood, collecting forest products etc. are also carried out by non agricultural households for their livelihood. November and December is mainly time for harvesting crops like rice, pumpkin, beans, roots, oilseeds etc. Winter crops are also sown and looked after. Mustard leaf is also harvested almost throughout the year because of irrigated land but majority is harvested in November and December. Economic activities beyond agriculture are also mentioned in the interactions during fieldwork. Recreational activity like sports is almost absent where the activity in the field requires more time. Besides church and community activities were also deeply rooted in the social life.

Spatial Organisation of Tawipui South Village

Social Mapping was conducted on Dt. 5th January, 2015 with 6 members of elders (see Figure 3.5.1). The Social map of Tawipui South shows that the village is an old village approximately 2 km long with a vast community land. The main occupation of the village is cultivation and a recent house listing shows that settled agriculture dominated the household occupation. Most of the settlement is along the roadside and the majority of settlement concentrated near the market. Even the schools, community hall, Health sub-centre, Public Health Centre, and other government departments were situated near the market. The village is a place where almost all the vehicle from the southern side stops for food and tea which gave the village a good opportunity of employment. The availability of market provides an opportunity for selling the products such as fruits and

vegetables which triggered the cultivation of cash crops and further led to the transformation from shifting cultivation to settled agriculture. In terms of land ownership most of the lands near the road site are owned by private for cultivation and the community land is shrinking. Most of the land are privatized and were given to farmer for cultivation through the programme of NLUP. Ownership of land from outside is almost absent but is rising as it is not very far from towns and cities. The village still owned a forest reserved area near the spring well which indicated that the farmers are aware of the consequences of deforestation. The map shows that sport infrastructure is less for the youth. Most of the youth are engaged in cultivation and help their families. Although the process of urbanization in the neighbouring villages also impacts the life of the people in many ways, the tools, input use and technique of agriculture were not developed as most of the households lack capital. Fruit cultivation emerged significantly and even the crops cultivated in the garden near the house are mostly fruits. Fruits are mainly cultivated as market opportunities are available even if productions are less. Marketing could be done easily as commissioners are available at village. The dependency on forest still exists in terms of fuel, food and timber. Farmers started cultivating oil palm which is new for the village. Most of the crops are selected according to the interest of the farmers and also based on the help available from the government. Transition from the shifting cultivation occurs long time ago and it occurs at a very fast rate in the recent years which is mainly due to the implementation of NLUP by the Mizoram government. But most of the lands along the national highway are cultivated and the lands other than that are not linked by roads which block the improvement of farming areas and in terms of input.

Infrastructure, Amenities and Facilities in Tawipui South: Services and Opportunities

A services and opportunities map of Tawipui South was prepared with the help of villagers during field work (see Figure 3.5.3). From the resource and opportunities map it is very clear that resources are not very far from the village as the village is situated between district capitals of Lunglei and Lawngtlai. The available government services except Public Health Centre (PHC) are not functioning well. District capital Lunglei is almost 51 km and Lawngtlai is nearer. Power sub-station is 8 km away from the village, all important service providers such as Post office, Anganwadi, Health Sub-Centre, Vety Office and PHE water tank located within 1 Km distance. But Gas agent is not available in the community they have to go to the next village in Thingfal which is around 15 Km from the village. Although schools up to class 10 are within the village the higher standard is not there and higher secondary school is also only 7 km from the village. The educational institution from college is located in Lawngtlai and Lunglei which are more than 50 kms away. The nearest hospital is in Lawngtlai and the PHC is not sufficient enough in terms of equipment and facilities. Although the services are near, they are not satisfactory which push the farmers to go to district headquarters. The village is located between Lawngtlai to Lunglei and the means of transport is good which push them to reach other services from other places.

Leite Village

Leite village is a shifting cultivator village situated along the national highway No. 54 between Aizawl and Lunglei via Hnahthial. It is situated only 7 km away from Hnahthial in the southern side towards Lunglei. It is an old village and a very long history could be traced back even before insurgency in Mizoram. Before, Leite was situated in 'Vaihmunlang' which was not far from the present location and bears the name itself.

The husband of a famous Queen Ropuiliani was Chief Vandula who had constantly war with the *pawih* from the Eastern Mizoram. Later on he was trying to have peace with the *pawih*. He was willing to give the place called 'Vaihmunlang' to the person who could bring peace between him and the *pawih*. So, knowing this Mr Thanhenga Khenglawt tried and succeeded to make peace between them and earned this place. The terrain of the village is rugged and they feel it safe from enemies. There are only three places for entry and the rest are high cliffs. It provided good conditions to set up a village and they grew to more than hundred households within no time. So when the highway cut through near the village, they resettled and settled in the present place. The present name is called 'Leite' which is a combination of two words '*Lei*' meaning bridge and '*te*' meaning small which means small bridge. The reason of naming the village as Leite is not known but many elders believed that as the village is surrounded by cliffs and has a rough terrain, a number of small bridges were built by the villagers to make their traveling easier. Because of this, the present name was given to the village.

Leite village presently has 190 households with a population of 723. The population has 347 men and 376 women where the number of females is higher in proportion. There are 53 households belonging to Below Poverty Line and 27 household belonging to AAY. The entire house in the village has electric connection whereas the village still does not have water connection. This is because the village has a spring well which could serve the community throughout the year. 185 households have septic tanks and the rest still use pit latrines. There are 2 (two) church denomination that is Baptist and United Pentecostal Church (North East) and some Christian without denomination. Baptist Church of Mizoram has the largest members. There are four (3) primary schools and among them one is private run primary school. The village also has one (1) government middle school and one (1) private high school. There is no higher educational

institution in the village and the nearest higher educational institution in Hnahthial is more than 8 km away. There are also certain government departments in the village such as four (4) Anganwadi centre and one (1) health sub-center.

Leite is a shifting cultivators' village. 40 households approximately practice shifting cultivation and use them for their primary source of income. A fast transformation of occupation from shifting cultivation to settled agriculture could be observed as most of the shifting cultivators owned settled land and started settled agriculture. 162 person received help under New Land Used Policy till the third phase. Mostly the trade selected under New Land Used Policy related to agriculture are Pineapple, coffee, orange and Wet Rice Cultivation-II. The non-agricultural trade some of them were also animal husbandry including cow farming and piggery, petty shop, carpentry, automobile and fishery. Non-agricultural trades are selected by larger group as most of the shifting cultivator gave up farming and move on to non-agricultural occupation. The mode of selection of beneficiaries is mainly done by the congress unit in the village. The criteria of selection of beneficiaries are mainly based on the membership of congress and the relatives of the village council. Consideration is also given to family without permanent occupation like widow which is observed from the key informant interview.

There are three main Non Governmental Organisations in the village manly the Young Mizo Association (YMA), Mizo Hemichhe Insuihkhawm Pawl (MHIP), Mizo Upa Pawl (MUP). Young Mizo Association (YMA) is the organisation of the youth, it have the largest membership even in the whole Mizoram. The YMA Branch is established in the year 1972 and currently have 285 members. The main aim of the existence of the oranisation is to help the needy and to uplift mizo nationalism. Mizo Hemichhe Insuihkhawm Pawl (MHIP) is an organisation of women established in the year 1974

mainly for welfare of women and women empowerment. Currently there are 165 members. Mizo Upa Pawl (MUP) is an organisation of the elderly established in the year 1987 for the welfare and protection of elderly. Currently there are 48 members. There are other small organisations such as self help groups, consumer association, organisation of students etc. Even political party also functions effectively in the community.

The activity in the village is related to agriculture as well as non agricultural activities and a trace of shifting cultivation could be observed (see Figure 3.6.2). The seasonal diagram shows that January and February are mainly used for land preparation which includes clearing of forest for shifting cultivators. In the month of February vegetation in the cleared field by the shifting cultivators are let dry for burning. '*Chapchar Kut*' the festival of Mizoram falls in the month of March and this month experience different agricultural activities. Burning of vegetation takes place and seeds are sowed in the later month. Rice is shown in the month of April and May in both the shifting cultivation and settled agriculture. Certain crops are planted by the settled agriculturalist such as Banana, Pineapple, Oranges, Chili and Ginger. This month is regarded as the best time for weeding because the grass died easily. Rainy season starts in the month of June and the weeds grow fast and the cultivators are mainly busy with weeding. Certain tree crops such as Zawnghah (Bitter beans), Broom, Coffee and Timber are planted in the month of July and August. Products from forest are also still collected by villagers like Bamboo Shoot, '*Pelh*' from the river bank. Labour employment in the field is also more in these months. The expenditure on food is decreased as food was provided from field which was observed during the fieldwork. Weeding process needs more efforts in the rainy season and labour employment is also higher. Rice is harvested at the end of September and October along with other crops and citrus fruits cultivated in a settled land. Other economic activities which are not agricultural related such as fishing,

hunting crabs, collecting firewood, collecting forest products etc. are also carried out by non agricultural households for their livelihood. November and December is mainly time for harvesting crops like rice, pumpkin, beans, roots, oilseeds etc. Economic activities which are non agriculture are also mentioned such as carpentry and labouring in the process of interaction with the villagers during fieldwork.

Transport is not a very big issue for the village of Leite as national highway 54 passes through it. The rate of transition from shifting cultivation to settled agriculture is also higher than other sample villages as the carpentry flourished in the villages which is strengthened by the New Land Used Policy. A labour class emerged as labouring in the area of agriculture and non-agriculture is a new profession where one finds enough to support their family. The emergence of this class is mainly due to the availability of labouring profession as many household transformed to settled agriculture and commercialised their occupation and needs labour force to maintain large area of land.

Spatial Organisation of Leite Village

Social Mapping was conducted on Dt. 18th January, 2015 with 7 members where most of them are farmer and elders (see Figure 3.6.1). Leite village is situated along the National highway 54 which is 7 km south of Hnahthial. Leite village is not a very big village where most of the settlements are along the road side which is around 2 km long. Most of the lands near settlement and along the road are owned privately. The main occupation of the village is cultivation and recent house listing shows that settled agriculture though dominated the occupation many of them still practice shifting cultivation where most of the crops are cash crops. Labour class emerged and carpentry is also practiced by many household and the village is also known for carpentry. The schools, community hall, Health sub-centre, Public Health Centre, and other government departments were distributed in all the areas and were not confined to one place. The

availability of transport provides an opportunity for selling the products such as fruits and vegetables which triggered the cultivation of cash crops and further led to the transformation from shifting cultivation to settled agriculture. Beside this the village is near to Hnahthial the block development centre and Lunglei which provide better the market opportunities for the farmers. In terms of land ownership, most of the lands near the roadside are owned privately for cultivation and the community land is shrinking. Most of the land are privatized and were given to farmers for cultivation through the programme of NLUP. Ownership of land from outside is observed at a high rate and the households with better living conditions own larger land. The map shows that sports infrastructure is not enough for the youth and most of the youth are engaged in cultivation and carpentry. The process of development also impacts the life of the cultivators in many ways but the tools, input use and techniques of agriculture were not highly developed as most of the households lack awareness and proper training. There is no security in marketing as prices are not stable and there is no insurance system for the farmers in case of crops failure. Fruit cultivation emerged as market opportunities are better than vegetables even if productions are less but crop failure is more frequent especially in orange. But the prices could not be fixed by the cultivators as most of the products are sold on commission and the farmers are exploited by intermediaries. The dependency on forest is more among the shifting cultivators and the settled agriculturalists use timber and wood products for carpentry. The farmers select crops based on their interest and market availability. Sometimes the government introduces crops based on the programme of the departments. Transition from the shifting cultivation occurs long time ago and it occurs at a very fast rate in the recent years which is mainly due to the implementation of NLUP by the Mizoram government. Most of the land are not linked by roads and there is no proper

electricity which slows down the development of farming areas in terms of input and employment of machines for terracing and irrigation.

Infrastructure, Amenities and Facilities in Leite: Services and Opportunities

Services and opportunities map of Leite village was prepared with the help of the community leaders during the fieldwork (see Figure 3.6.3). Leite village is a small village without much services and opportunities within the village especially government services. There were health services like health sub-center, Anganwadi and educational service where school up to class X is available within the village. Although the village is situated along the national highway the services are lacking in the village. But services like higher education, hospital, government departments are available only in the block headquarters that is Hnahthial which is 13 km from the village. The main water source is a public water point connected from a river which was 3 kms away from the village. There was government plan to build water storage tank for the village but it was never incorporated. Although the services within the locality are limited, the village is linked by national highway with the district headquarters, Lunglei and block headquarters, Hnahthial where services are easily available therefore the villagers do not feel the absence of those services in their village. Even the market is available in the nearby village for selling agricultural products.

3.1.4 New Land Use Policy of Government of Mizoram

The practice of jhum cultivation is a debatable subject among foresters, ecologists, economists, and policymakers. It is believed that Jhum is the main cause of deforestation and land degradation in Mizoram (Lianzela 1997). Jhum is believed to be a large emitter of carbon dioxide; therefore, the government decided that the jhum cultivation system should be stopped at all costs to protect the environment. After the colonization of the

British the practice of jhum cultivation is often declared as an extravagant and unscientific form of land use. (Leblhuber et. a., 2012).

History of New Land Use Policy

In response to the environmental degradation and to stop Jhum cultivation, the government of Mizoram introduced an alternative policy called the New Land Use Policy (NLUP) in the year 1984-85 with an aim to put an end to the practices of shifting cultivation. The Policy provides the farmers with sustainable land based activities as an alternative where 6068 households were assisted in establishing commercial plantations by the Forest Department but the policy was terminated in 1989-1990 as it was proved ineffective (Leblhuber et. a., 2012).

In 1987, National Development Council of India runs a pilot Jhum Control Project having 1936 beneficiaries in Aibawk Block and Tuipang Block through the State Agricultural Department in place of NLUP. The main trades selected are horticulture (47%), animal husbandry (20%), wet rice cultivation (10%), coffee plantation (9%), and cottage industries (5%) and the policy also soon discontinued without positive results (Mizoram 1991). NLUP was implemented once again in the year 1990 targeting Jhum cultivators who do not have other means of livelihood under the Rural Development Department. Financial assistance was given covering 30,000 to 41,000 families (Mizoram, 2000). But the policy does not have specific goals and it does not encourage the jhum cultivators' to move towards alternative livelihoods and was once again terminated in 2000–2001 without much fruit. When the Mizo National Front (MNF) formed a new ministry in the year 2000, the New Land Use Policy was reformed and was renamed the Mizoram Intodelhna Project. This project was implemented for the self-sufficiency of the Rural Poor where financial assistance of Rs 50,000 was provided to selected families especially the Jhumias to help them undertake livelihood other than

Jhum cultivation. But the programme was not effective to stop and control Jhum Cultivation (Lianzela, 2008).

Recent NLUP Programme

Later, when the Congress government in Mizoram formed a ministry in 2008, they reintroduced New Land Used policy for a period of ten years as promised during the election campaign. The Indian Central Government set aside Rs 2,416 Crores for the project. NLUP operates through Departments of Agriculture, Horticulture, Industries, Forests, Fisheries, Sericulture, and Soil and Water Conservation to cover 120,000 families. NLUP is managed in four different levels such as NLUP Apex Board at a state level headed by the Chief Minister to look after overall supervision of the implementation of the programmes. Below this, NLUP Implementing Board function which is headed by the Chief Minister to approve plans/programmes, allotment of funds and also overall supervision of the implementation of the programmes. The NLUP Implementing Board allocates funds to line departments and ensure implementation of the schemes. The management in the District Level is under the NLUP District Committee headed by the concerned Deputy Commissioner with District officers to supervise and monitor the project implementation, organize training and demonstration etc. The fourth level is the Village Development Committee (VDC) which is constituted by all the NLUP beneficiaries in the village (NLUP Manual 2009).

Beneficiaries are selected with the involvement of the community as Village Council and the beneficiaries are selected in consultation with the NGOs and even the involvement of political parties could be observed in some villages. Allotment of Land is also made for beneficiaries who require land in consultation with concerned authorities mainly Land Revenue and Village Council Authorities. Financial Assistance for the

beneficiaries as alternative to livelihood activities as envisaged under NLUP is Rs.126980.00 lakhs covering a total of 120000 families in 5 years.

It is expected that NLUP Programme will progressively wean away shifting cultivation and assist farmers to alternative livelihood activities. NLUP programme focused on increased production of essential items like paddy, pulses, oil seeds, vegetables fruits, livestock, fisheries etc. for food security and self-sufficiency. The main aim of this programme is to encourage afforestation on a large scale for environmental protection and opening up scope for carbon economy. NLUP is aiming at commercial production of agri-horticultural produces on commercial scale for which Mizoram has a great potential. It might be because of the sustained efforts in this direction that even the shifting cultivation is carried on with commercial crops in many areas. Apart from generating livelihood opportunities in rural areas, NLUP also promises Micro Enterprises in cottage and small scale industries which generate employment opportunities in non-farm sector. Commutative impact of such micro enterprise is expected to generate employment.

3.2 Methodology

The methodology of the present study is presented in different sections viz., research design, sampling, tools of data collection and data processing and analysis. The limitations of the present research are also highlighted.

3.3.1 Research Design

The present study is a cross sectional in nature and the design is a mixed method design. The study was conducted in two phases. In the first phase, qualitative data is collected with the help of PRA methods to understand the context and nature of agrarian

transformation taking place in the villages and the factors and forces at work therein. In the second phase, a quantitative data on agrarian change and development is collected using structured pretested household interview schedule. Though Qualitative as well as quantitative data are used for realizing the objectives of the study, greater weightage is assigned to quantitative data.

3.3.2 Sampling

The population of the present study constitutes all the households depending upon agriculture in rural Mizoram. The unit of the study is households. The study uses multi stage sampling procedure to select district, villages and households.

Lunglei district was chosen purposively as both the shifting cultivation as well as settled agriculture is practiced. Further, the district was chosen as it records the highest growth rate in number of cultivators in Mizoram. The number of cultivators in Lunglei district in 2001 is 65.23 per cent and the district experiences a highest growth of cultivators as compared to the other districts of Mizoram in 2011 reaching 73.27 per cent which makes it a suitable place to study transformation of agriculture from shifting cultivation to settled agriculture.

In Lunglei district, four villages were chosen purposefully based on their nature of cultivation. Two villages who are predominantly practicing settled agriculture and two village who are predominantly practicing shifting cultivation were selected. The villages are also selected based on their distance from the Lunglei headquarters classified as far and near. One shifting cultivator village and one settled agriculture village from near the district head quarters were selected and in the same way, one shifting cultivator village and one settled agriculture village from far were selected purposefully to have better representation.

In each of the villages, the lists of households in very poor (AAY), poor (BPL) and non-poor (APL) categories were collected from the village council records. However, the information from the village council was not showing the real image of occupation of the cultivators in the village and so house listing was done and fresh lists of very poor, poor and non-poor households were compiled and non-cultivator households were included. In each of the category, using systematic random sampling method, households were proportionately selected.

The sample size of the study is 282 households (Which constitute 0.85% of the households in Lunglei district). The study covers 4 villages viz., Lungsen, Tawipui South, Leite and Muallianpui. Among the villages Lungsen and Tawipui South represents settled agriculture villages and Leite and Muallianpui represent shifting cultivator villages. The villages are also selected based on their distance from the district headquarters. Villages with similar distances were selected where Tawipui South village and Leite village represent the nearby village from the district headquarters. Lungsen village and Muallianpui represent the villages far away from the district headquarters.

3.3.3 Tools of Data Collection

The present study uses both qualitative and quantitative methods of data collection. In the light of the contextual understanding developed, structured household interview schedule was used to collect quantitative data among the sample households to understand the link between agrarian transformation and tribal development. The interview schedule contains 20 sections with a number of sub-sections. The major sections are demographic profile, Profile of Respondents, Household Particulars, facilities and amenities, Financial Capital, Social Capital, Land Possession, Livestock, crops

cultivated, Tool and input use, ecological consequences of shifting cultivation, NLUP, difficulty faced by agriculturalist and suggestion made by the farmers etc.

The structured household interview schedule is pretested in the village and modifications were made in the light of the pre-test. The final survey was done during July to December 2014. Beside this village schedule was also prepared to collect information regarding the present status of the village. Qualitative on the other hand was collected using participatory method i.e. Participatory Rural Appraisal (PRA). PRA techniques like time line, social mapping, seasonal diagram, services and opportunities map were used to understand the field setting.

3.3.4 Data Processing and Analysis

The quantitative primary data collected through field survey were processed with computer packages of Microsoft Excel and SPSS. Simple statistical methods of averages, percentages, ratios and proportions are used to analyze quantitative data. For hypothesis testing, Karl Pearson's product moment correlation coefficients and 't' test are used.

3.4 Concept and Operational Definitions

Shifting Cultivation

Shifting Cultivation: Shifting Cultivation is the system of shifting cultivation to have originated in the Neolithic Period around 7000 BC (Sharma 1976). Jhuming is the only practical method of cultivation on the steep slopes of the hills which was closely linked with social customs, mythology and religion of the people especially in the North East India (Elwin Verrier 1960). Broadly speaking, these systems involves the cutting of a section of a forest, burning, planting of a variety of crops, harvesting and then moving on to cut a new patch of land after certain years of cropping seasons (Thrupp et. al. 1997).

The process of land preparation includes clearing of field by felling, cutting, slashing and burning. In many places in Europe, for instance, the practice is known as "swidden" agriculture (Pelzer 1978). It consists of highly diverse land use systems that vary from mountain to lowland ecosystems and from tropical forests to grasslands (Spencer 1966; Sharma 1976). As shifting cultivation is always attended through clearing and burning of forests which destroys forest and the environment around us (Misra, 1976) causes calamities like flood, drought, soil erosion (Das 1976; Agarwal 1985), and more recently the Global Warming (Lanly 1985). In the mean time Jaganath Pathy (1986) an anthropologist, agreeing with Elwin defends shifting cultivation as a highly organized and efficient method of mixed cropping based on sound empirical knowledge. He stressed the importance of developing shifting cultivation on scientific line so as to limit its disadvantages and promote soil fertility.

From the above discussion shifting cultivation is mainly operated in hilly region among the tribal. It involves clearing of forest and burning which is shifted from one place to another. Mixed cropping pattern is practiced as different varieties of crops are grown in one time and place. Not only the economy of the tribal depends on shifting cultivation but also linked to their culture. Many believed jhum cultivation as wasteful and degrading environment. It is also seen as a careful way of managing common land. But with the growing population the pressure on land is more and the fallow period decreased. The government also declared shifting cultivation as wasteful, and implemented a policy to stop it. In the mean time many scholar believed that it is better to improve this method rather than to stop it as the life of millions of tribal depend on it.

Agrarian Reform

Agrarian Reform is a measure designed to overcome obstacles that are the result of shortcomings in the agrarian structure and which are hindering economic and social

development such as changes in land ownership, tenancy and labour organization as well as changes in land use. It is a process through which property relations and political powers are redistributed in such a way as to favor the interests of the rural poor. Ronald Herring defined Agrarian reforms as a name worthy of the name transform rural society through alterations in the property structure and production relations, redistributing power and privilege. Agrarian reforms make use of legal force and intervene in the property and land use rights of the people, although with certain compensations.

Land reform has been used interchangeably with agrarian reform and both concepts have been equated with land distribution and sometimes even with abolition of feudalism. Land reform implies change of title to the land, change of status from tenant to owner, or from public to private ownership. Historically land reform has meant a change in tenure and generally redistribution of land in favor of the peasant and may also indicate a change from individual to collective ownership or vice versa, depending on the specific reforms measure. In this sense, land reform implies change of title to the land, change of status from tenant to owner or from public to private ownership (Tuma 1963).

Tribal Development

Development is an aspect of change that is desirable, broadly predicted or planned and administered or at least influenced by governmental action. The term 'development' is also used for the process of allowing and encouraging people to meet their own aspirations in areas of economic, social, political and administrative aspects (Basu 1985: 26). The Constitution of India entrust the State to promote special care of the educational and economic interest of the scheduled tribes and to protect them from social injustice and exploitation (GOI 2015). The development of tribal is also approached through institutions and committees. Agriculture remains the most defining factor in the development of the human society and continues to play a vital role in Indian economy

(Zaitinwra 2014). The radical approach to tribal development manifests itself in the form of tribal movement. The results are noticeable in the North East and in Central India. Some of the current tribal movements are Jharkhand Movement in Bihar, Bodo Land movement in Assam, Gorkha land movement in West Bengal, Sub-Jati Sameeti in Tripura and Tribal movement in Bastar in Madhya Pradesh etc. (Sharma, 1989:33).

3.5 Limitations of the present study

The major limitation of the present study is the accuracy of the information on the economic indicators viz., asset value, income, expenditure, savings and debts. The people do not practice book keeping or financial accounting on a daily basis and from memory recall only they could report these details. They may not be so accurate. However, efforts were made by the researcher to get the information as reliable as possible.

In this chapter an attempt has been made to present the empirical and policy contexts of the present study area. It also described the various aspects of the methodology of the present study in terms of research design, sampling design, operational design, tools of data collection, processing and analysis etc. In the next chapter, the structural bases of shifting and settled cultivators are described.

Figure 3.3.1 Social map of Muallianpui

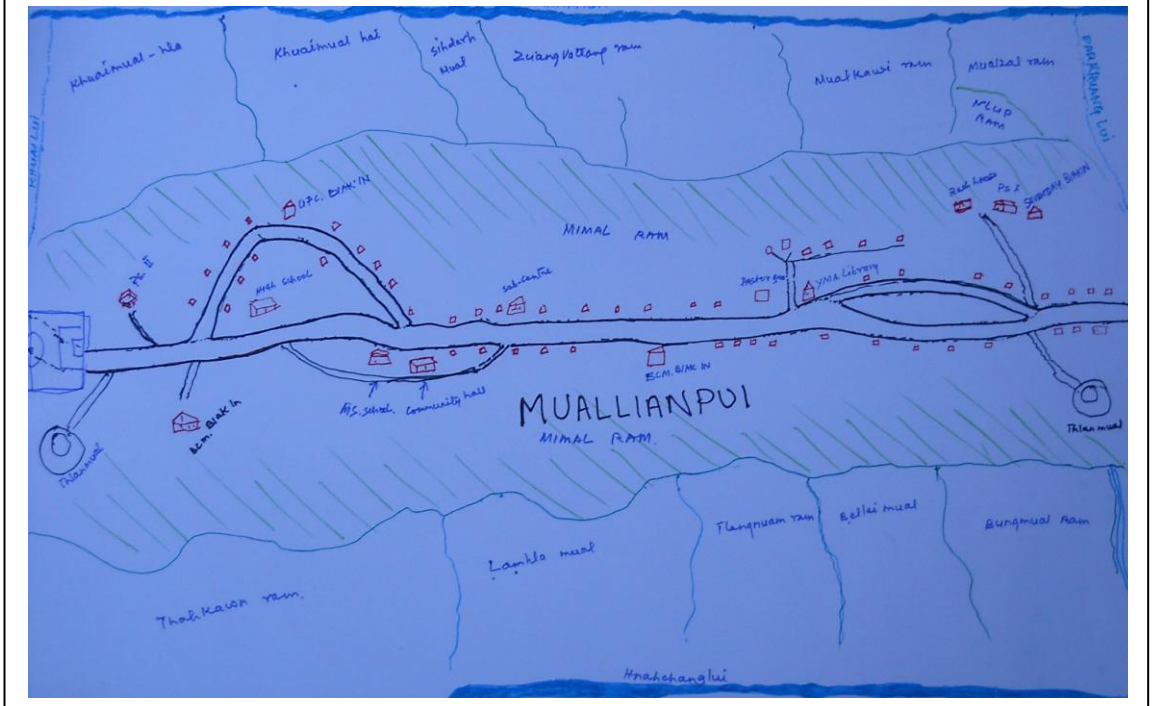


Figure 3.3.2 Seasonal Diagram of Muallianpui

SEASONAL DIAGRAM		
MONTH	ACTIVITIES	FOODS & FRUITS
January	1. D'kon ban (festival) 2. Loi noi	Zikham, baka, Anjan, wadi, Sankham
February	1. Deo dai 2. Loi noi	Zikham, Sankham, bakham, dugunoi
March	1. Deo dai 2. Chaphon noi 3. Loi noi	cham, Sankham
April	1. Loi noi 2. Loi noi 3. Loi noi	Khung, Sankham
May	1. Loi noi 2. Football Tournament 3. Loi noi	Khung, wadi, Sankham, dugunoi, Sankham
June	1. Loi noi 2. MA DAY	Anjan, wadi, bakam, machon, wadi
July	1. Loi noi 2. Loi noi 3. Loi noi	cham, wadi, Sankham, Anjan, dugunoi, Loi noi, Sankham
August	1. Loi noi 2. Loi noi	Pan, wadi, machon, Loi noi, Anjan, bakam
September	1. Loi noi 2. Loi noi 3. Loi noi	cham, Sankham, bakham, Anjan
October	1. Loi noi 2. Loi noi	cham, Loi noi, Sankham, bakham, Sankham
November	1. Loi noi 2. Loi noi 3. Loi noi	cham, Loi noi, Sankham, bakam, Loi noi
December	1. Loi noi 2. Loi noi 3. Football Tournament	Sankham, Sankham, Loi noi, Anjan, cham

Figure 3.3.3 Services and Opportunities Map of Muallianpui

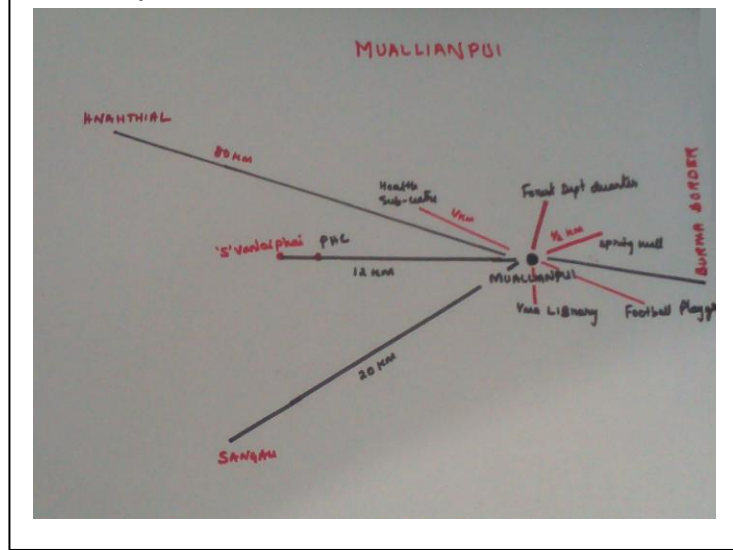


Figure 3.4.1 Social map of Lungsen



Figure 3.4.2 Seasonal Diagram of Lungsen

MONTH	ACTIVITIES	FRUITS	FOOD
JANUARY	BUKTIK LAMU, MINGGUKAN DAY, CARAB, 20 FEB, EPRIKAL DAY	BANILA, CARABUT, TONKOC	ANTAN, BANKEAM, BANKEAM, BAL, BELLANG, CHAKAI, CHENGKANG, MAIAN, MAI, SANTAN, SANDIR, SAMSTAN, TONK
FEBRUARY	BUKTI LAMU, 10 FEB, 20 FEB, 20 FEB	BANILA, CARABUT, MINGGUKAN, TONKOC	ANTAN, BANG, BANKEAM, BANKEAM, CHAKAI, CHENGKANG, MAIAN, MAIAN, SANDIR, SAMSTAN, TONK
MARCH	CHENGKANG, 10 FEB, 20 FEB, 20 FEB, 20 FEB, 20 FEB	BANILA, CARABUT, MINGGUKAN, TONKOC	ANTAN, BANG, BANKEAM, BANKEAM, CHAKAI, CHENGKANG, MAIAN, MAIAN, SANDIR, SAMSTAN, TONK
APRIL	BUKTI LAMU, 10 FEB, 20 FEB, 20 FEB, 20 FEB, 20 FEB	BANILA, CARABUT, MINGGUKAN, TONKOC	ANTAN, BANG, BANKEAM, BANKEAM, CHAKAI, CHENGKANG, MAIAN, MAIAN, SANDIR, SAMSTAN, TONK
MAY	BUKTI LAMU, 10 FEB, 20 FEB, 20 FEB, 20 FEB, 20 FEB	BANILA, CARABUT, MINGGUKAN, TONKOC	ANTAN, BANG, BANKEAM, BANKEAM, CHAKAI, CHENGKANG, MAIAN, MAIAN, SANDIR, SAMSTAN, TONK
JUNE	BUKTI LAMU, 10 FEB, 20 FEB, 20 FEB, 20 FEB, 20 FEB	BANILA, CARABUT, MINGGUKAN, TONKOC	ANTAN, BANG, BANKEAM, BANKEAM, CHAKAI, CHENGKANG, MAIAN, MAIAN, SANDIR, SAMSTAN, TONK
JULY	BUKTI LAMU, 10 FEB, 20 FEB, 20 FEB, 20 FEB, 20 FEB	BANILA, CARABUT, MINGGUKAN, TONKOC	ANTAN, BANG, BANKEAM, BANKEAM, CHAKAI, CHENGKANG, MAIAN, MAIAN, SANDIR, SAMSTAN, TONK
AUGUST	BUKTI LAMU, 10 FEB, 20 FEB, 20 FEB, 20 FEB, 20 FEB	BANILA, CARABUT, MINGGUKAN, TONKOC	ANTAN, BANG, BANKEAM, BANKEAM, CHAKAI, CHENGKANG, MAIAN, MAIAN, SANDIR, SAMSTAN, TONK
SEPTEMBER	BUKTI LAMU, 10 FEB, 20 FEB, 20 FEB, 20 FEB, 20 FEB	BANILA, CARABUT, MINGGUKAN, TONKOC	ANTAN, BANG, BANKEAM, BANKEAM, CHAKAI, CHENGKANG, MAIAN, MAIAN, SANDIR, SAMSTAN, TONK
OCTOBER	BUKTI LAMU, 10 FEB, 20 FEB, 20 FEB, 20 FEB, 20 FEB	BANILA, CARABUT, MINGGUKAN, TONKOC	ANTAN, BANG, BANKEAM, BANKEAM, CHAKAI, CHENGKANG, MAIAN, MAIAN, SANDIR, SAMSTAN, TONK
NOVEMBER	BUKTI LAMU, 10 FEB, 20 FEB, 20 FEB, 20 FEB, 20 FEB	BANILA, CARABUT, MINGGUKAN, TONKOC	ANTAN, BANG, BANKEAM, BANKEAM, CHAKAI, CHENGKANG, MAIAN, MAIAN, SANDIR, SAMSTAN, TONK
DECEMBER	BUKTI LAMU, 10 FEB, 20 FEB, 20 FEB, 20 FEB, 20 FEB	BANILA, CARABUT, MINGGUKAN, TONKOC	ANTAN, BANG, BANKEAM, BANKEAM, CHAKAI, CHENGKANG, MAIAN, MAIAN, SANDIR, SAMSTAN, TONK

Figure 3.4.3 Services and Opportunities Map of Lungsen

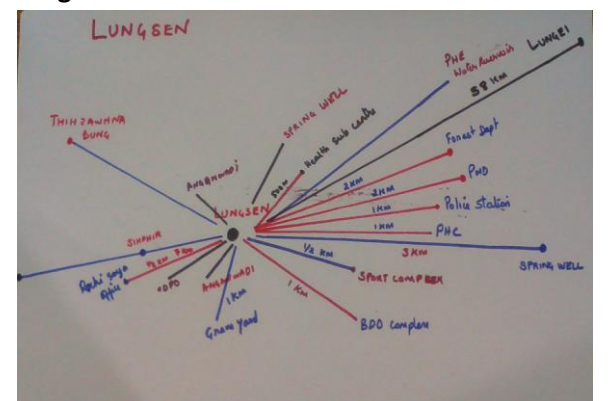


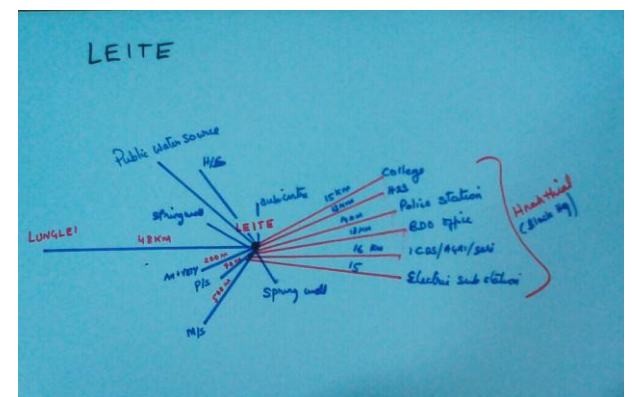
Figure 3.6.1 Social Map of Leite



Figure 3.5.2 Seasonal Diagram of Leite

MONTH	ACTIVITIES	FRUITS	FODDING
January	Lopak, Lepak, kumhar, kumhar, Niswary, Bay, kumhar, kumhar	Bottle, Coffee	Baling, Akon, kumhar, kumhar, Niswary, Bay, kumhar, kumhar
February	Lopak, Mangkuk, kumhar, kumhar, kumhar	ANPA	Southeast, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar
March	Lopak, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar	Bottle, kumhar	Klingan, kumhar, kumhar, kumhar, kumhar, kumhar
April	Buk, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar	Bottle, kumhar	Changkul, kumhar, kumhar, kumhar, kumhar, kumhar
May	Buk, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar	Bottle, kumhar	Tanjung, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar
June	Huan, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar	Lakuk, kumhar, kumhar, kumhar	Southeast, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar
July	Buk, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar	Lakuk, kumhar, kumhar, kumhar, kumhar	Southeast, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar
August	Huan, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar	Southeast, kumhar, kumhar, kumhar, kumhar	Southeast, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar
September	Lopak, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar	Bottle, kumhar, kumhar, kumhar	Tanjung, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar
October	Buk, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar	Southeast, kumhar, kumhar, kumhar	Southeast, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar
November	Buk, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar	Southeast, kumhar, kumhar, kumhar	Southeast, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar
December	Buk, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar	Southeast, kumhar, kumhar, kumhar	Southeast, kumhar, kumhar, kumhar, kumhar, kumhar, kumhar

Figure 3.5.3 Services and Opportunities Map of Leite



CHAPTER IV

SOCIAL STRUCTURAL BASES OF CULTIVATORS

The present study probes into the process of agrarian transformation from shifting cultivation to settled agriculture. The primary question that arises here is with reference to the differences in social structural background between the shifting cultivators and settled agriculturists. In other words, whether the social demographic and economic structural positions of the households contribute to the transformation is the concern here.

In this chapter, the social structural bases of Shifting and Settled Cultivators have been presented in four major sections viz., demographic structural bases, familial structural bases, social structural characteristics and economic structural bases.

4.1. Demographic Structural Bases

Demographic structure refers to the population characteristics of the respondents. The demographic structural characteristics of the respondents discussed here are gender, age group and educational status (see Table 4.1).

The first demographic characteristic taken for analysis is Gender. Gender is a crucial social structural variable that governs human relations in every society (Zaitinwawra and Kanagaraj 2008). Like most of the human societies, Mizo society is patrilineal and patriarchal in nature. On the whole, majority of the respondents were male. Male respondents constitute 53.5% and the women constitute 46.5 % of the sample. There is no much difference between the pattern of gender distribution of respondents among the shifting cultivators and settled cultivators.

Age is the second demographic variable taken up for description. Age is an important demographic variable and aged is respected in most of the traditional societies. Mizo society is no exception to this general rule (Zaitinwawra 2014). The age of

respondents in the present study was classified into three groups viz., Young (below 35 years), Middle Aged (35-60) and Old (above 60 years). The results indicate that on the whole majority of the respondents belonged to middle age group (35 - 60 years) which constitutes 53.9% of total number of respondents. Young (below 35 years) constitutes 23.4% and old (above 60 years) constitute 22.7% of the respondents. Between the shifting and settled cultivators, differential pattern of distribution in the age group could be observed. Among the shifting cultivators, middle Aged (48.6%) constitute the highest followed by Youth (32.4%) and Old (18.9%) age group. Whereas, among the settled cultivators Middle Age group (55.8%) constituted the highest proportion of the respondents. It is followed by Old (24%) and Youth (20.2%) groups respectively. The pattern shows that the shifting cultivators are relatively younger than the settled agriculturalists.

Educational status of the respondents is the third demographic characteristic taken for analysis and description. Education is one of the components of development and it can also be construed as one of the factors responsible for social transformation and development. The respondents are distributed across five categories viz., illiterate, primary, middle, higher secondary, and college and above. On the whole, almost all of the respondents (98%) were literate. Most of the respondents have education up to primary level (70%). As the level of education, the proportion of the respondents declines from middle school till the college level. The pattern of distribution of the respondents across the levels of education among the both the categories of cultivators are similar to the overall pattern.

However, the settled agriculturalist respondents seem to have slightly higher level of education as compared to those of the shifting cultivators. The settled agriculturalist (2.9) are slightly higher in College and above than the shifting cultivation (2.7). But the

shifting cultivators (4 %) are higher in higher secondary school than the settled agriculturalist (3%). In Middle School the settled agriculturalist (24%) are much higher than the shifting cultivators (15%). The lowest in the classification that is the Primary level the shifting cultivators (79%) are higher than the settled agriculturalist (67%).

4.2. Familial Structural Bases

Family is one of the primary institutions of society and universal. In this section, the family structural bases of the respondents are described in terms of four characteristics viz., type of family, size of family, forms of family and gender of head of family (see Table 4.2).

Families of the present study are generally divided into Nuclear and Joint families in terms of their generational constitution. Hence, the first indicator of the familial structural bases taken up for analysis is type of family. On the whole, a vast majority of the respondents belong to nuclear type of family (92.2%) and very few of them (7.8%) belong to structurally joint family.

In the pattern of distribution of the respondents across the nuclear and joint families, no notable difference could be observed and both of them resemble the overall pattern of distribution. Among the shifting cultivators, a predominant majority (93.3%) of the respondents belong to nuclear family while a few (6.7%) belong to Joint family. The same pattern is also seen among the settled agriculturalist where majority of the families are of nuclear type (91.8%) while a few belong to joint family (8.2%). A similar finding was reported by Zaitinvawra & Kanagaraj (2008) in Mizoram. The survival of nuclear family could be attributed to the Mizo traditional practice that only the youngest among the siblings stays with the parents to look after them, the rest move out from their house and form a nuclear family when they are in a position to look after their own family.

The size of family determines the strength of working force in the family especially those dependent on agriculture as a source of livelihood. The second indicator of the familial structural bases of respondents taken for analysis and description is the size of family. The size of family in the present study has been classified into small (1-3 members), medium (4-6 members) and large (7 members and above). Similar classification of family size has been followed in earlier studies on community development in Mizoram (see Kanagaraj 2013; Lalengzama 2011; Zaitinvawra and Kanagaraj 2008; Hmar and Kanagaraj 2007; Lalrinliana and Kanagaraj 2005).

On the whole, a simple majority of the sample households belong to Medium size family (50.4%), which is followed by Small size family (33%) and the large size family (16.7%) respectively in order. This overall pattern of distribution of family size classes is reflected among the shifting cultivators and settled agriculturists. Among the shifting cultivators, medium family (45.3%) constituted the highest proportion followed by small family (30.7%) and the large family (24%) in the order. The pattern of distribution of family size classes among the settled cultivator is the similar to the overall pattern where medium family (45.3%) contribute the highest proportion followed by small family (33.8%) and the lowest is large family (14%).

However, the family size among the shifting cultivators is found slightly greater than that of settled cultivators. The proportion of respondents with small family is slightly more among the settled agriculturalist (33.8%) as compared to that of shifting cultivators (30.7%). The proportion of medium size family is more among the settled cultivators (45.3%) as compared to that of the shifting cultivators (45.3%). The proportion of the respondents belonging to large family is comparatively more among the shifting cultivators (24%) as compared to the settled agriculturalists (14%). The pattern shows that shifting cultivator household is comparatively larger than the settled agriculturalists.

A similar pattern was also observed in the study made by Zaitinvawra & Kanagaraj (2008) and Kanagaraj & Ralte (2012).

Form of family reflects upon the marital stability and cohesion in the nucleus of the family. The form of family also determine the strength and coping abilities of a family in the process of transformation of agriculture from shifting to settled agriculture (Lalenzama 2011). As observed from the field work that stable cohesive families always work together, look after more land than the broken and reconstituted families, more productive and prosperous as compared those households broken due to marital break down. Hence, the third indicator of the structural bases of families taken up for analysis and description in the present section is the form of family. The form of family is classified as stable, broken and reconstituted (see table 4.2). A similar classification of form of family in the context of Mizoram is reported by earlier studies documented (see Lalenzama 2011; Zaitinvawra and Kanagaraj 2008).

A predominant majority of the families in the whole sample belonged to stable forms of family (93.3%) while a few families constitute broken (5%) and reconstituted structures (1.8%). Similar patterns of distribution of forms of family could be observed among shifting cultivators and settled agriculturists. Almost all of the shifting cultivators had stable form of family (92%) followed by broken family (4%) and reconstituted family (4%) equally. Similarly, the most of the settled agriculturalist had stable form of family (93.7%) followed by broken family (5.3%) and reconstituted family (1%) contributed respectively. A similar distribution of form of family was observed in Mizoram in an earlier study made by Zaitinvawra and Kanagaraj (2008).

Gender of the head of family assumes significance in the context of community development especially, poverty, inequality and livelihood security. Earlier studies on poverty in Mizoram have reported greater likelihood of poverty to female headed

households. A female headed household is more often found to be poor and vulnerable to external shocks than a male household. Hence, the fourth indicator of the structural bases of families is the gender of head of family (see Table 4.2).

On the whole, a predominant majority of the heads of family are male (83%) and the rest are female headed household (17%). The male headed household in the present study is higher among the shifting cultivators (90%) than the settled agriculture (80%). This overall pattern of distribution of gender of heads of family could be observed among both the type of cultivators. However, the proportion of female headed household is slightly greater among the settled agriculturalists (20%) as compared to that of the shifting cultivators (7%). On the other hand, the proportion of the male headed households is greater among the shifting cultivators (90%) as compared to that among settled cultivators (80%).

4.3 Social Structural Characteristics

Social structure is a pattern of social arrangement in society that are both emergent from and determinant of the actions of the individuals. Mizo social structure is supposed be constituted with major tribe, sub-tribe, clan, family pattern (Vidyarthi and Rai, 1976). The sub-tribe and type of clan are the two elements of traditional Mizo social structure while denomination constitutes a significant element of modern Mizo society (see Hmar and Kanagaraj, 2007). The social structural characteristics such as sub-tribe and religious denomination the respondents are discussed as under (see table 4.3).

The first social structural characteristic taken up for analysis and description is sub-tribe of the respondents. In the villages studied, the respondents belonged to four sub-tribes of Mizos viz., Lusei, Paite, Ralte and Hmar.

On the whole, a two third majority of respondents belonged to the Mizo sub-tribe of Lusei (68.1%) followed by Paite (20.6%), Ralte (6%) and Hmar (4.3%) while the non-Mizo settlers who married to Mizos constitute only 1.1% (see Table 4.3). Though the same pattern of distribution of sub-tribes could be observed among both the type of cultivators, the proportion of the members of Lusei tribe could be observed more among the settled cultivators (71%) as compared to that among shifting cultivators (61%). On the other hand, among the shifting cultivators the proportion of Paite (29.3%) is greater as compared to that among the settled agriculturalists (17.4%). The proportion of the members of the Paite sub tribe is greater among the shifting cultivators is greater because one of the shifting cultivator villages is situated on the Myanmar border where there were influx of the population of Paite from Myanmar.

Religion plays a significant role as one of the elements of structure of Mizo society. The 2011 census shows that Christians in Mizoram constitutes 86.97% of the population. The Mizos are Christians professing different denominations. Among the respondents the Christian denominations such as Baptist, Presbyterian, UPC (NE), UPC (Mizoram), Seventh day Adventist, Roman Catholic and a few Christians without belongingness to any denomination were reported. Also a few non-Christians could be seen (see Table 4.3).

As in the southern part of Mizoram the Baptists constitute the biggest religious denomination of all, most of the respondents belongs to Baptist Church of Mizoram (71%), followed by United Pentecostal Church (NE) (14.2%), United Pentecostal Church (Mizoram) (4.6%), Presbyterian (4.3%), Seventh Day Adventist (1.4%), Roman Catholic (1.4%) and Christians without denomination (0.7%). The Non-Christians constituted a few (3%).

The overall pattern of distribution of respondents across denominations could also be observed among both the types of cultivators. The proportion of members following Baptist church is slightly more among the shifting cultivators (72%) as compared to the settled agriculturalist (71%). The proportion of followers of UPC (NE) church is slightly greater among the shifting cultivators (19%) than the settled agriculturalist (13%). But proportion of the members of UPC (Mizoram), Presbyterian and Seventh Day Adventist are more among the settled agriculturalist.

4.4 Economic Structural Bases

The economic structural bases are discussed at the household level. The economic structural bases are discussed in terms two dimensions viz., occupational structure and Socio Economic Category (see Table 4.4).

4.4.1 Occupational Structure

Occupation indicates the class position of a household. In Mizoram, majority of the population depend on agriculture for their livelihood (GOM 2011). Primary occupation of a vast majority of the respondents was agriculture and the present study also select household with agriculture as a primary occupation for sample. The occupation of the households in the present study is classified into primary occupation, secondary occupation and tertiary occupation in terms their contribution to the household income (see Table 4.4).

Primary Occupation of the households mainly comprises of cultivation, agricultural labour, animal husbandry and government service. On the whole, cultivation (82%) was the primary occupation for a predominant majority of the households, followed by animal husbandry (14%), agricultural labour (3.5%) and government service (0.5%). Similar pattern of distribution of respondent households across the primary

occupations could be observed among both the shifting and settled cultivators. However, the proportion of the households with cultivation (94%) as primary occupation was greater among shifting cultivators as compared to that of settled cultivators (77%). On the contrary, the proportion of the households with animal husbandry as primary occupation is greater among the settled agriculturists (19%) as compared to that of the shifting cultivators (0%).

In the pattern of primary occupation of shifting cultivators, cultivation (95%) remains the main occupation which is followed by agricultural labour (4%) and government service, (1%). Animal Husbandry as the primary occupation is absent among the shifting cultivators.

Secondary occupation of households was classified into agricultural labour, animal husbandry, business, government service and cultivation (see table 4.4). Secondary occupation of households is more diversified than the primary occupation and the level of distribution is similar among the shifting cultivators and settled agriculture.

Agricultural labour (65%) forms the highest proportion of respondents' secondary occupation followed by animal husbandry (14%), business (11%), government service (6%), and cultivation (2%).

The structure of the secondary occupation among the shifting cultivators and the settled agriculturalist was observed to be similar in the present study. The proportion of households with Agricultural Labour as secondary occupation is greater among the shifting cultivators (69%) as compared to the settled agriculturalists (63%). The proportion of households relying Animal husbandry as a secondary occupation is similar across the shifting cultivators (13%) and settled agriculturalists (13%). Business as a secondary occupation needs more financial capital and so a comparatively greater proportion of respondent households among the settled agriculturalists (13%) have it as

compared to those of shifting cultivators (5%). Further, it could be observed that the Government servants are more among the settled agriculturalist (7%) as compared to the shifting cultivators (4%). Cultivation as a secondary occupation is observed among the sample household as the settled agriculturalist (2%) use Jhum cultivation as a secondary and the shifting cultivators (3%) use sedentary cultivation as a secondary occupation. This clearly indicated that although transformation takes place towards settled agriculture, a few settled agriculturalists still continue Jhum as a buffer as they perceive it a sure form of production.

Tertiary occupation is observed among both type of cultivator viz., shifting and settled. On the whole, a vast majority of the sample households (74%) do not have tertiary occupation. The pattern of distribution of tertiary occupation of the respondents could be observed as Animal Husbandry (16%), Agricultural labour (9%) and Business (1%) (see table 4.4). The settled agriculturalists (18%) have a higher percentage of animal husbandry as compared to the shifting cultivators (12%) as tertiary occupation. Agricultural labour is also more among the settled agriculturalists (11%) as compared to the shifting cultivators (4%). Business is absent among the shifting cultivators while the settled agriculturalist have 1%.

4.4.2 Socio Economic Category

Socio economic category of the households indicates their class position. The categorisation of households by village Council as beneficiary under Antyodaya Anna Yojana (AAY), Below Poverty Line (BPL) and Above Poverty Line (APL) was considered as socio economic categories viz., very poor (AAY), poor (BPL) and non-poor (APL) respectively. Sample Households were selected proportionately from these categories and this categorisation helps us to understand the socio economic background of the respondents (see Table 4.2).

On the whole, a greatest proportion of the households belong to the non-poor category (45%) which is followed by poor (39%) and very poor (16%). The same pattern of distribution of respondent households across the shifting cultivators and settled agriculturists could be observed. There was not much difference in the proportion of the very poor households between shifting cultivators (15%) and settled agriculturists (16%). However, the proportion of the non-poor households was slightly greater among the settled cultivators (47%) as compared to that of shifting cultivators (40%). This clearly shows that there is not much difference between both types of farmers regarding the socio economic status. The transformation of agriculture to settled cultivation has no impact on the status and livelihood of households which may be attributed to the fact that the transformation is still in its initial stages and results are yet to be seen.

In this chapter, an attempt has been made to discuss the differences in the demographic, familial, social and economic structural bases of the respondent households belonging to the categories of shifting cultivators and settled agriculturists. In the next chapter, an attempt has been made to discuss the results of quantitative data analysis on the agrarian transformation from shifting cultivation to settled agriculture.

Table 4.1 Demographic Characteristics of the Respondents

Sl.No	Characteristic	Type of Cultivation		Total N = 282
		Shifting n = 75	Settled n =207	
I	Gender			
	Female	33 (44.6)	98 (47.1)	131 (46.5)
	Male	41 (55.4)	110 (52.9)	151 (53.5)
II	Age Group			
	Youth (18 -35)	24 (32.4)	42 (20.2)	66 (23.4)
	Middle Aged (35 - 60)	36 (48.6)	116 (55.8)	152 (53.9)
	Old (60 and Above)	14 (18.9)	50 (24.0)	64 (22.7)
	Mean Age	45	50	49
	Standard Deviation	14	15	15
III	Educational Status			
	Illiterate	0 (0.0)	7 (3.4)	7 (2.5)
	Primary (1-4)	58 (78.4)	139 (66.8)	197 (69.9)
	Middle (5-8)	11 (14.9)	50 (24.0)	61 (21.6)
	Higher Secondary (9-12)	3 (4.1)	6 (2.9)	9 (3.2)
	College and Above	2 (2.7)	6 (2.9)	8 (2.8)

Source: Computed

Figures in parentheses are percentages

Table 4.2 Familial Characteristics of the Respondents

Sl.No	Characteristic	Type of Cultivation		Total N=282
		Shifting n = 75	Settled n =207	
I	Type of Family			
	Nuclear Family	70 (93.3)	190 (91.8)	260 (92.2)
	Joint family	5 (6.7)	17 (8.2)	22 (7.8)
II	Size of Family			
	Small(1 -3)	23 (30.7)	70 (33.8)	93 (33.0)
	Medium(4 - 6)	34 (45.3)	108 (52.2)	142 (50.4)
	Large(7 and Above)	18 (24.0)	29 (14.0)	47 (16.7)
III	Form of Family			
	Stable	69 (92.0)	194 (93.7)	263 (93.3)
	Broken	3 (4.0)	11 (5.3)	14 (5.0)
	Reconstituted	3 (4.0)	2 (1.0)	5 (1.8)
IV	Gender of Head			
	Female	7 (9.6)	42 (20.1)	49 (17.4)
	Male	66 (90.4)	167 (79.9)	233 (82.6)

Source: Computed

Figures in parentheses are percentages

Table 4.3 Social Characteristics of the Respondents

Sl.No	Characteristic	Type of Cultivation		Total N=282
		Shifting n = 75	Settled n =207	
I	Sub tribe			
	Lusei	46 (61.3)	146 (70.5)	192 (68.1)
	Paite	22 (29.3)	36 (17.4)	58 (20.6)
	Ralte	2 (2.7)	15 (7.2)	17 (6.0)
	Hmar	4 (5.3)	8 (3.9)	12 (4.3)
	Non-Mizo	1 (1.3)	2 (1.0)	3 (1.1)
II	Denomination			
	Baptist	54 (72.0)	146 (70.5)	200 (70.9)
	UPC (NE)	14 (18.7)	26 (12.6)	40 (14.2)
	UPC (Mizoram)	2 (2.7)	11 (5.3)	13 (4.6)
	Presbyterian	1 (1.3)	11 (5.3)	12 (4.3)
	The Seventh Day Adventist	0 (0.0)	4 (1.9)	4 (1.4)
	Roman Catholic	2 (2.7)	2 (1.0)	4 (1.4)
	Christians without Denomination	0 (0.0)	2 (1.0)	2 (0.7)
	Others	2 (2.7)	5 (2.4)	7 (2.5)

Source: Computed

Figures in parentheses are percentages

Table 4.4 Economic Characteristics of the Respondents

Sl.No		Type of Cultivation		Total N=282
		Shifting n = 75	Settled n =207	
I	Primary Occupation			
	Cultivation	71 (94.7)	160 (77.3)	231 (81.9)
	Animal Husbandry	0 (0.0)	40 (19.3)	40 (14.2)
	Agricultural Labour	3 (4.0)	7 (3.4)	10 (3.5)
	Government Service	1 (1.3)	0 (0.0)	1 (0.4)
II	Secondary Occupation			
	Agricultural Labour	52 (69.3)	130 (62.8)	182 (64.5)
	Animal Husbandry	10 (13.3)	27 (13.0)	37 (13.1)
	Business	4 (5.3)	26 (12.6)	30 (10.6)
	Government Service	3 (4.0)	15 (7.2)	18 (6.4)
	Cultivation	2 (2.7)	4 (1.9)	6 (2.1)
	None	4 (5.3)	5 (2.4)	9 (3.2)
III	Tertiary Occupation			
	Animal Husbandry	9 (12.0)	37 (17.9)	46 (16.3)
	Agricultural Labour	3 (4.0)	23 (11.1)	26 (9.2)
	Business	0 (0.0)	2 (1.0)	2 (0.7)
	None	63 (84.0)	145 (70.0)	208 (73.8)
IV	Socio Economic Category			
	Very Poor (AAY)	11 (14.66)	33 (15.94)	44 (15.60)
	Poor (BPL)	31 (41.33)	80 (38.64)	111 (39.36)
	Non-Poor (APL)	30 (40.0)	97 (46.85)	127 (45.04)

Source: Computed

Figures in parentheses are percentages

CHAPTER V

AGRARIAN STRUCTURE AND TRANSFORMATION

Agrarian structure has long been recognized as one of the most important determinants of agricultural development (Ghosh 1998). Boserup (1956) argues that societies under pressure from population growth, invent their own technologies to increase food production. In the same way as it is mentioned in Boserupian theory the change from shifting to permanent cultivation does not take place automatically with increasing population pressure. The landless households also earn their livelihood with others means of economic activities such as wage labour, carpentry and other non agricultural occupation (Shekhar and Chand 2015).

Agrarian transition is driven by transformations in social property relations, which are witnessed in the emergence of differentiated access to productive assets and the commoditisation of labour. It takes place when the favourable condition created by population growth is reinforced by ownership rights to land, development of infrastructure and provision of necessary support services and facilities (Rasul and Thapa, 2003). When people are going for commercial farming, the jhum cultivation is replaced by settled cultivation.

In this chapter, the discussion on Agrarian Structure and Transformation is presented into six major sections viz., Nature of land possession, Pattern of land possession, Ownership of livestock, Cropping pattern, Tools used in cultivation, Input use and Perception on ecological consequences of shifting cultivation.

5.1. Nature of Land Possession

Land constitutes the chief basis of productive activity in the rural society (Joshi, 1969). Land is also an important asset for human survival and represents natural capital. It

is an important factor that determines the living condition of the rural households and individuals. In the rural and tribal context of Mizoram too land is pivotal for survival, livelihood sustenance and development of the people. Land is the major source of livelihood for farmers in Mizoram and elsewhere in Tribal India. The pre-colonial Mizo society held land important as their dependence and connection with the forest is still very high. The land was considered to be owned by the chief but the population had communal rights over the forest and the resources. The chief levy taxes on his subjects in kind as a symbol of political authority. The chief has supreme authority over land distribution. The livelihood and survival of culture and religion depends on forest and land (Vanlalruati, 2015).

The nature of land possession has been analysed in terms of five sets of indicators viz., number of plots possessed, area of land holding, distributions of land, duration of land holding and source of land. The following subsections discuss the results of analysis of variation in the pattern of land possession between the shifting cultivators and settled agriculturists (see Table 5.1).

5.1.1 Number of Plots Possessed

The first dimension of agrarian transformation taken for analysis is the number of plots possessed. In an earlier study on shifting cultivation, the number of plots was considered as an indicator of agrarian structure and transformation (see Zaitinvawra and Kanagaraj 2008).

In the context of Lunglei district in Mizoram, four modes of land possession were observed in earlier studies viz., Land Settlement Certificate (LSC), Periodic Land Pass (PLP), temporary pass(also known as VC pass) and Common Land (see Lalenzama and Kanagaraj 2013, Zaitinvawra and Kanagaraj 2008). These modes of land possession are

assessed for differences in the pattern of land distribution and variation in size across the two types of cultivators (see Table 5.1).

As regards the pattern of land distribution across the different modes of land possession (ownership) viz., Land Settlement Certificate (LSC), Periodic Land Pass (PLP), temporary pass and Common Land there is significant difference between the shifting cultivators and settled agriculturists. On the whole, more than one half of the land is reportedly under periodic land pass (56%), which is followed by the land under LSC (23%), Common land (20%), and least under temporary pass (0.5%). The pattern of land distribution across these four modes of possession among the settled cultivators is by and large similar to the overall pattern as majority of the respondent households are settled cultivators. One exception is that there is no land under temporary pass (TP) with the settled cultivators. On the other hand most of the land with shifting cultivators is under common land (54%), which is followed by PLP (34%), LSC (11%), and TP (2%).

The average number of plots of land possessed by settled agriculturists is significantly greater than that of the shifting cultivators. On the whole, the average number of plots of land possessed by respondent households is 1.5. The number of plots of land possessed by the shifting cultivator households (1.6) is greater than that of the settled agriculturalist households (1.4). The computed t value (2.0) is significant at 5 percent level.

The number of plots possessed under PLP and LSC are significantly greater with the settled cultivators as compared to shifting cultivators while the number of plots under common land is greater with shifting cultivators as compared to settled cultivators. The t ratios of PLP (4.3) and LSC (2.7) were significant at 1 percent level. The average number of plots possessed under PLP is significantly higher among the settled agriculturalists (0.9) as compared to the shifting cultivators (0.5). On the contrary, the possession of

number of plots under common land is significantly higher among the shifting cultivators (0.9) as compared to the settled agriculturalists (0.1). However, there is no significant difference in the land possessed under temporary pass between the two types of cultivators. The computed t ratio (1.7) is not even significant at 5 percent level.

5.1.2 Area of Land Holding

The indicator of nature land possession analysed is the area of land under different modes viz., Periodic Land Pass (PLP), Land Settlement Certificate (LSC), Common land and Temporary Pass. The area of land possessed by the respondent households is measured in terms of Acres and analysed for differences in pattern and variation in size (see Table 5.1).

The pattern of area of land distributed across the various modes of ownership/possession is similar to that of the pattern of distribution of number of plots observed in the last section. The order of distribution is periodic land pass (56), land settlement certificate (23.0), common land (20.3) and temporary pass (0.5). The pattern of land distribution of land across these four categories among the settled cultivators is similar to the overall pattern. The mean area under PLP is greatest (60%) is the largest followed by the LSC (41%), Common Land (3%) and no land is under TP. However, the pattern of land distribution among the shifting cultivators is different. The Common Land is the largest (57%) followed by PLP (29%) and LSC (14%). Most of the area of land of the shifting cultivators is under common land (CL) while that of settled cultivators is under periodic land pass (PLP).

The average area of land held by the settled cultivators is significantly greater than that of the shifting cultivators. It is clear that the switchover from shifting to settled cultivation results in increase in the size of land holding. The average area of land possessed by both the shifting cultivators' households and the settled agriculturalists'

households in the present study is 6 acres. The settled agriculturalists (6.4 Acres) possessed greater area of land than the shifting cultivators (5.1 Acres). The difference is statistically significant at 5 percent level ($t = 2.4$).

The area under PLP and LSC are significantly greater among the settled cultivators as compared to that of shifting cultivators. The t ratios for difference between shifting and settled cultivators with reference to PLP (5.2) and LSC (2.8) are significant at 1 percent level. Under PLP the average area of land for shifting cultivators was worked out to 1.5 acres while it is 3.6 acres for settled cultivators. Likewise, the settled cultivators on an average have 2.6 acres of land under LSC while shifting cultivators have 0.7 acres of land under this title.

On the other hand, the area under common land (CL) is significantly greater for the shifting cultivators as compared to the settled cultivators. The t ratio 19.8 of differences in common land between the two types of cultivators is significant at 1 percent level. The average area under common land held by settled cultivators was just 0.2 acres while it was worked out to 2.9 acres.

5.1.3 Duration of Land Holding

The duration of land holding is the third indicator of structural change and transformation in agrarian structure in the context of Mizoram. The major feature of shifting cultivation is that its temporary and cyclical nature. Hence, duration of land holding is considered for assessing transformation. The number of years holding land was assessed for different modes of possession (ownership) Periodic Land Pass (PLP), Land Settlement Certificate (LSC), Common land and Temporary Pass. The mean years of duration of land holding was analysed for the difference between the shifting cultivators and settled cultivators (see Table 5.1).

The pattern of duration of land holding across the modes is similar to those of the number of plots and area of land holding. It also follows the same pattern Periodic Land Pass (PLP), Land Settlement Certificate (LSC), Common land (CL) and Temporary Pass (TP) on the whole. The pattern of land possession across these four modes by the settled cultivators is similar to that of the overall pattern.

The duration of Land holding under PLP and LSC is significantly greater among the settled agriculturalists as compared to the shifting cultivators. The computed t ratio for PLP(2.8), and LSC(1.9) are significant at 1 and 5 percent respectively. The mean duration of land under periodic land pass for shifting cultivators is 6 years while it was 10 years for settled cultivators. Likewise, the duration of land under LSC is greater for settled cultivators (5 Years) as compared to that of shifting cultivators (2 Years).

On the other hand, the duration of cultivation of common land is significantly greater for shifting cultivators as compared to settled cultivators. The computed t ratio (10.2) is significant at 1 percent level. The mean duration of cultivation of common land worked out for shifting cultivation is 1 years while it was just 1 month to settled cultivators.

5.1.4 Source of Land Holding

The fourth indicator studies for assessing the transformation in the agrarian structure in the wake of transition from shifting cultivation to settled agriculture is that of source of land. This is to know whether the privatisation of land ownership results in transfer of ownership. An open ended question was how the respondent got the land. The source of land possessed by respondents across the different modes viz., Periodic Land Pass (PLP), Land Settlement Certificate (LSC), Common land and Temporary Pass (see Table 5.2).

The results indicate that there are two major sources of landholding or ownership viz., allotment by village council and purchase. Land under common land and TP held by both the shifting cultivators and settled cultivators were allotted by the village councils. On the other hand, there are some who own land under LSC and PLP purchased land also. Though most of the respondent households do not own land under LSC (72%), a significant proportion of them got land from village council (18%) and a few have purchased land also (9%). The proportion of the respondents got land allotment by the village council is significantly greater among the settled cultivators (22%) as compared to the shifting cultivators who got land from village council (7%). This clearly shows the emergence of market for rural land in the wake of land settlement. On the contrary, the proportion of the respondents who purchased land with LSC is slightly greater among the shifting cultivators (11%) as compared to those of settled cultivators (9%). A similar pattern of source of land can be observed in the case of PLP also. A two third majority of the households among the settled cultivators got land from the village council (69%) while more than one third of the respondents got PLP from the village council (37%). The proportion of the respondents who have purchased land with PLP is slightly greater among the shifting cultivators (9%) as compared to the settled cultivators (8%).

5.2. Pattern of Land Distribution

The fifth indicator of agrarian structure taken up for analysis is the pattern of distribution of land among the cultivators. The size of land in the present study has been classified according to the classification of the Ministry of Rural Development Classification The households have been divided into three classes viz., Marginal (Below 2 acres), Small (2-5 Acres), and Medium (5-10 Acres) on the basis of the total area possessed by them. The pattern of distribution of land among the sample households and

the distribution of households across the classes both were analysed for their difference across the shifting cultivators and settled cultivators (see Table 5.3). Further, the inequality in the distribution of land across these two categories of the farmers has been compared with the help of Gini coefficients.

As seen in the earlier section, the size of land holding increases with land settlement. The settled cultivators own slightly greater size of land holding as compared to the shifting cultivators. This overall increase in the size of land holding seems to be accompanied by increase in the inequality in the distribution of land. The Gini coefficients and the Lorenz curves clearly show that the inequality in area of land owned by the shifting cultivators is lower than that among the settled cultivators. The computed Gini coefficient of land distribution among the shifting cultivators was 0.271 while it was worked to be 0.397. Four percent of large farmers among the shifting cultivators own more than 10 percent of land. On the other hand, 12 percent of the large farmers among the settled cultivators own 35 percent of land. Among the shifting cultivators, 15 percent of the marginal farmers own 6 percent of the total land area. On the other hand, 17 percent of the settled cultivators who are marginal farmers own only 5 percent of land.

As transition from shifting cultivation to settled agriculture takes place, two major trends are emerging. There seems to be operation of centripetal and centrifugal tendencies in the agrarian transformation due to the transition from shifting to settled cultivation. The first trend is embourgeoisement whereby the medium farmers are becoming large farmers. This could be observed from the increase in the proportion of the number of households and proportion of area under large size of holding class as the cultivators switch over from shifting to settled cultivation. The proportion of large farmers among the settled cultivators (12%) is greater than that among the shifting cultivators (4%). Similarly, the proportion of area under large holdings under shifting cultivators (11%)

was significantly lower than that among the settled cultivators (35%). On the other hand the proportion of the medium farmer households among the settled cultivators (18%) is significantly lower than that among the shifting cultivators (28%). Similarly, the proportion of the area with the medium farmers among the shifting cultivators (39%) was greater than that among the settled cultivators (24 %).

The second trend is similar to that of proletarianisation. In the context of Mizoram, though the cultivators are not becoming labourers and depeasantisation is not taking place, the small farmers are becoming marginal farmers and the proportion of number of households increases while the area under small size of landholding class decrease. Among the shifting cultivators 15 percent of the marginal farmers possess only 6 percent of land. On the other hand, 17 percent of the marginal farmers among the settled cultivators own only 5 percent of area of land. As regards small farmers, the proportion of number of households remains same while the area under their holding declines. Among the shifting cultivators 53 percent of the small farmers hold 44 percent of land area while among the settled cultivators 53 percent of the small farmers own only 35 percent of land.

5.3 Ownership of Livestock

Livestock ownership is the sixth indicator of agrarian structural transformation probed in this study. Livestock rearing is one of the sources of livelihood in tribal communities from time immemorial. Livestock can be construed as one of the forms of capital or livelihood assets viz., natural capital and plays a vital role in sustaining the well being of households in rural and tribal areas.

In the context of Mizoram, it was customary for the Mizos to rear only pigs and cow rearing was unknown (Lalenzama and Kanagaraj 2013). In an earlier study Lalenzama and Kanagaraj (2013) found the emergence of cow rearing practice among

the settled cultivators. They observed significant increase in value of livestock owned as result of switch over to settled cultivation from shifting cultivation. They also observed livelihood diversification due to the increase of livestock ownership. The livestock owned among the shifting and settled agriculturalists in the present study comprises of six types viz., Pigs, Cow, Poultry, Fish, Goat and Horse. The rupee values of these forms of livestock owned by the households was analysed for difference and their share in the total value of livestock owned for pattern variation between shifting and settled cultivators (see Table 5.4).

There is significant difference in the total value of livestock owned between the shifting cultivators and settled agriculturists. It is clear that as the farmers switch over to settled cultivation from shifting cultivation there is no change in the livestock owned by them. This finding is contradictory to the finding of earlier study by Lalenzama and Kanagaraj (2013). The observation in the field shows that the rearing of cows has emerged among the shifting cultivators also. The computed t ratio (0.36) is not significant even at 5 percent level. The value of livestock owned by the farmers as a whole is Rs 11,699. Though the value of livestock owned by the settled agriculturalists (Rs 12,164) is slightly higher than the livestock owned by shifting cultivators (Rs 10,413), the difference is not statistically significant.

Between the shifting cultivators there are differences in the values of the various forms of livestock owned viz., Pigs, Cow, Poultry, Fish, Goat, and Horse. The computed t ratios for assessing the significance of differences between the shifting and settled cultivators viz., Pigs(0.02), Cow(0.54), Poultry(1.13), Fish(0.97), Goat(1.16), and Horse(1.67) were not even significant at 5 percent level.

As a whole, the pattern of the value of livestock owned in the present study shows that the share of Pig (55%) contributed the highest which is followed by Cow (28%),

Poultry (14%), Fish (2%), Goat (1%) and Horse (0.2%). This overall pattern of livestock ownership is similar to that of the settled cultivators alone. The pattern of livestock ownership among the shifting cultivators' household shows that Pig (62%) contributed the highest which is followed by Poultry (22%), Cattle (15%), Horse (1%), Goat (0.2%) while Fish is absent. Whereas a different pattern is observed among the settled agriculturalist where Pig (53%) contributed the highest which is followed by Cow (32%), Poultry (12%), Fish (2%), Goat (1%) and Horse is absent.

Cattle rearing have emerged among both the settled cultivators and the shifting cultivators mainly because it is one of the trades selected under NLUP. The settled cultivation and livestock rearing are interdependent as the bi-products of cultivation are useful to feed the livestock. Moreover in return, livestock rearing helps in weeding and they also supply organic manure for the cultivation (Lalenzama 2011).

5.4 Cropping Pattern

Cropping pattern is the seventh aspect of agrarian structural transformation probed in the present study. The question here is that how cropping pattern changes in response to transition from shifting cultivation to settled agriculture.

A remarkable feature of shifting cultivation is crop diversity. Datta (1992:32) reports that almost all varieties of cereals and vegetables are grown in one field, which is rather impossible to have in wet plain land. Zaitinvawra and Kangaraj (2008) reported similar picture of diversity among the crops diversity. They have also reported that a cropping pattern shift from food crop to vegetable crops and also a shift from subsistence cultivation to commercial agriculture as the transition from shifting cultivation to settled agriculture happen. A recent study by Lalenzama and Kanagaraj (2013) also found similar changes in the cropping pattern due to the transition. They held that the transition

from shifting to settled cultivation resulted in commercialisation and emergence of mono cropping with a single vegetable crop.

To probe into the changes in the cropping pattern the crops cultivated are divided into four categories viz., cereals, pulses and oilseeds, vegetable and fruits. This classification was used in earlier studies conducted in Mizoram (see Lalenzama and Kanagaraj 2013; Zaitinvawra and Kangaraj 2008). The fruits cultivated by the respondents are Pineapple, Orange, Banana, and Passion fruit, lemon, wild orange (*Hatkora*) and Mango. Major crops under Vegetable are Mustard, Cabbage, Beans, Cauliflower and Pumpkin, Brinjal. Cereals cultivated among the respondents are Rice and Corn. Coffee, Broom, Bitter Bean and Teak are the tree Crops cultivated by the households. Oil Palm is a new crop introduced few years back cultivated among the respondents, Cultivation of Pulses is almost absent among the farmers studied.

The differential patterns of cropping across the shifting and settled cultivators in the present study has been probed in terms of number of crops cultivated by farmers, number of farmers cultivating different crops, purpose of cropping and area under cropping (please refer tables 5.5 -5.7).

5.3.1 Number of Farmers Cultivating Different Crops

Number of farmers cultivating the different types of crops viz., Fruits, Vegetables, Cereals, Tree Crops, Oil Seeds and Pulses is the first indicator of cropping pattern. The pattern and proportion are compared between shifting and settled cultivators (see Table 5.5).

The pattern of cultivation of different crops by sample households differs between the shifting cultivators and the settled agriculturalists. On the whole, the majority of the respondent households cultivate fruits (67%) which are followed by the proportion of farmers cultivating Tree Crops (46%), Vegetables (45%), Cereals (32%) and Oil Seeds

(12%). The cropping pattern of the settled cultivators is similar to that of overall pattern where the proportion of farmers cultivating fruits (77%) is the highest which is followed by those cultivating Tree Crops (38), Vegetables (30%), Cereals (27%) and Oil Seeds (16%) respectively. A different pattern of cropping could be observed among the shifting cultivators. The cropping pattern among shifting cultivators shows that Cereals (96%) and Vegetables (91%) are cultivated by most of the farmers which followed by those who cultivate Fruits (39%), Tree Crops (17%), Oil Seeds (1%) and Pulses (1%).

The proportions of farmers cultivating commercial crops such as fruits, tree crops and oil seeds are significantly greater among the settled agriculturalists as compared to those of the shifting cultivators. Among the settled cultivators 77% households cultivated fruits as compared to the 39% of shifting cultivators who cultivate fruits. Likewise, the more proportion of farmers cultivate Tree Crops among the settled agriculturalists (38%) as compared those among shifting cultivators (17%). Similarly, the proportion of farmers cultivating Oils seeds is greater among the settled cultivators (16%) as compared to that of shifting cultivators (1%). On the other hand the crop meant for subsistence i.e. cereals are cultivated by a greater proportion of the shifting cultivators (96%) than the settled agriculturalists (27%). However, the proportion of farmers cultivating the vegetables is more among the shifting cultivators (91%) as compared to the settled agriculturalists (3%).

The results of analysis of number of farmers cultivating different crops clearly show that the shift from subsistence to commercialisation has happened in the context of the present study too as already reported (see Lalenzama and Kanagaraj 2013; Zaitinwawra and Kangaraj 2008).

5.3.2 Number of Crops Cultivated

The second indicator of cropping pattern is the number of crops cultivated. In earlier studies on shifting cultivation, significantly greater number of crops cultivated by shifting cultivators over the settled cultivators were reported (see Lalenzama and Kanagaraj 2013; Zaitinvawra and Kangaraj 2008). In the present study also the number of crops cultivated per farmer was computed and shifting cultivators and settled cultivators were compared.

The number of crops cultivated is greater among the shifting cultivators (8.3) as compared to the settled agriculturalists (3.3). A typical shifting cultivator grows 6 vegetables, and two cereals in a year. Two shifting cultivators grow at least one fruit crops. One among the five of them cultivates at least a tree crop. And they rarely cultivate oilseeds or pulses. On the other hand, a typical settled cultivator cultivates at least 2 fruits, and a1 vegetable. Two settled cultivators cultivate at least one tree crop and cereal. One among five of them cultivate oil seed i.e. oil palm tree. However, this difference in the number of crops cultivated between the shifting cultivators and settled agriculturists are not statistically significant. The computed t ratio (0.75) is not even significant at 5 percent level. This result is contrary to the observation made in the earlier studies on agrarian transform in Mizoram (Lalenzama and Kanagaraj 2013; Zaitinvawra and Kanagaraj 2008).

The cropping pattern in terms of the number of crops is different among the shifting cultivators from the settled agriculturalists. The cropping pattern of the shifting cultivation shows that the proportion of number of crops per farmer is the highest on vegetables (70.2 %) which is followed by the share of Cereals (1.7) and Fruits (0.5), Pulses (0.01) and Tree Crops (0.2) while Oil Seed is absent. The settled agriculturalist had a different pattern where the proportion of crops per farmer is the highest in Fruits

(44.4%) which is followed by Vegetables (0.8), Tree Crops (0.5), Cereals (0.4), and Oil Seed (0.2) while Pulses are absent.

On the whole, the largest number of farmers cultivating vegetables (2.2), who are followed by those who cultivate fruits (1.2), cereals (0.7), Tree Crops (0.7), and Oil seeds (0.3). The overall cropping pattern resembles that of the settled cultivators. The field observation of the present researcher indicates that the number of farmers cultivating the Oil Palm trees is increasing since 2008 as there is government support for cultivation under NLUP.

Significantly greater number of fruits, tree crops, and oil seeds are cultivated among the settled cultivators as compared to those among the shifting cultivators. On the other hand, the number of vegetables, cereals, and pulses are significantly cultivated in greater number among the shifting cultivators as compared to those of settled cultivators. The number of fruits cultivated is greater among the settled agriculturalists (1.5) as compared to that of shifting cultivators (0.5). Similar differences can be observed in case of tree crops between the settled cultivators (0.5) and shifting cultivators (0.2). The number of oil seeds cultivated by the settled cultivators (0.2) is significantly greater than that of the shifting cultivators (0.0). On the contrary, the number of vegetables cultivated is comparatively more among the shifting cultivators (5.8) as compared to the settled cultivators (0.8). Likewise, the number of cereals cultivated is significantly greater among the shifting cultivators (1.7) as compared to the settled agriculturalists (0.4).

5.3.3 Area under Different Crops

The third indicator of cropping pattern is that of area under crop which is used by most of the scholars. As measurement of area is difficult in the context of Mizoram because the farmers do lack the knowledge and in the hilly topography of land further complicates the measurement. In addition to area, the number of crops and farmers were

used as indicators so as to gain greater clarity on the matter. The area of cropping in the present study is measured in acres which are presented across the classification of crops in the previous sub section viz., Fruits, Vegetables, Cereals, Tree Crops, Oil Seeds and Pulses. This indicator was analysed for variation in the pattern and level (see Table 5.7). Gross cropped area as well as crop diversity index was also computed and variation between the shifting and settled agriculturists was analysed.

The gross cropped area is measured by the sum total of the area under all the crops. There is no significant difference in the gross cropped area under cultivation between the shifting cultivators and settled cultivators. The computed t ratio is not even significant at 5 percent level. The gross cropped area among both the type of cultivator households is calculated to be 5 acres. The settled cultivators had significantly greater area under cultivation of fruits, tree crops and oil seeds while the shifting cultivators have significantly greater area under cultivation of cereals, and vegetables.

Crop diversity was assessed in terms of Simpson's Index of Diversity (SID)ⁱ. The crop diversity index value is significantly greater among the shifting cultivators as compared to settled cultivators. The mean SID (0.5) is significantly greater among the shifting cultivator households as compared to that of the settled cultivators (0.3). The computed 't' ratio for the mean difference in SID (5.67) is significant at 1 percent level.

On the whole, the pattern of cropping in terms of area shows that the proportion of area under Fruits (43%) is the largest area followed by Cereals (21%), Vegetables (15%), Tree Crops (14%), Oil Seeds (6%), and Pulses (0.4%). This overall cropping pattern is similar to that of the settled cultivators while that of the shifting cultivators is different. Among the shifting cultivators, the greatest share of area under cultivation is held by the share of area under cereals (49%) which is followed by Vegetables (27%), Fruits (17%), and tree crops (6%).

5.3.4 Purpose of Cropping

Earlier studies on transition from shifting to settled cultivation showed significant qualitative transformation from subsistence to commercialisation in the Mizoram context (see Lalenzama 2011). Closer observation in the field shows that it is a matter of attitude and motivation rather than the crops themselves can be classified as commercial and subsistence. To probe further, the respondents were asked to state purpose of their cultivation of different crops. There are three purposes identified. They are for household consumption, for market and both for household consumption and market across the categories of crops such as vegetables, fruits and cereals (see Table 5.8).

The results of analysis of the purposes reveal that greater proportion of the settled cultivators is producing crops for sale in the market while a greater proportion of shifting cultivators produce for both market and household consumption. Thus the idea of the production for market has entered into the minds of the shifting cultivators also. Among the settled cultivators, most of the cultivators of fruits (77%), and vegetable (18%) grow their crops for selling in the market. On the other hand, most of the shifting cultivators who cultivate vegetables (60%), Cereals (69%) produce it for both selling in the market and for domestic consumption. Both the type of cultivators produces fruits for selling in the market. Among the settled cultivators 77 percent produce fruits for markets while only 37 percent of the shifting cultivators produce fruits for market. The proportions of farmers producing crops exclusively for market is greater in case of vegetables and fruits among the settled cultivators as compared to those of shifting cultivators.

5.4 Tools Used in Cultivation

Tools and its uses form technology which is necessitated for economic development especially in agriculture (Zaitinwawra and Kanagaraj 2008). Studies on tool

use and its implementation among the Mizos is also studied by the Thangchungnunga (1997), Lalenzama (2011), Lalenzama and Kanagaraj (2013).

The tools used by the respondent households in farming in the present study are classified into four types such as Forest clearance tools, Weeding tools, Harvesting tools and Irrigation tools. Forest clearance tools mainly include Chempui, Hreipui and Chemsei. Land Preparation tools mainly include *Thirtieng*, *suahdur* (spade), Power tiller and Tractor. Weeding tools includes *Chemkawm*, *Chemsei*, *Tuthlawh* and Mechanical weeding machine. Harvesting tools includes *Dawrawn*, *Em*, *favah*, *Empai*, *Paikawng* and *Thlam Em* which are mainly for carrying. Irrigation tool is almost absent and one Diesel Water Pump set was observed (see Table 5.9 & Table 5.10).

5.4.1 Number of Farmers Using Agricultural Tools

The proportion of respondents employing tools in the present study is presented across classification of tools viz., Forest clearance tools, Weeding tools, harvesting tools and Irrigation tools (see Table 5.9).

On the whole, land preparation tool (76.9%) is used by the largest number of cultivators in the present study which is followed by Forest clearance tools (62.2%), Harvesting tools (59.4%) and Weeding tools (47.8%). The switchover from shifting cultivation to settled agriculture resulted in the decrease of forest clearing tools and increase in land preparation tools.

The number of farmers employing Land preparation tool is almost the same between both the farmers but the settled agriculturalist (78%) employ which is more than the shifting cultivators (75%). Surprisingly, forest clearance tools are also almost the same but higher among settled agriculturalist (63.6%) as compared to shifting cultivators (61.3%). As different crops needs specific harvesting tool, harvesting tools is more employed by the shifting cultivators (68%) more than the settled cultivators (63.6%) as

crop diversity is more among the shifting cultivators. Weeding tool is employed by both the farmers where settled agriculturalist (48.3) is slightly more than the shifting cultivators (47.7).

The shifting cultivation pattern of tool used shows that employment of Land Preparation tool (75.3%) is the highest followed by Harvesting tool (68%), Forest clearing tool (61.3%) and Weeding tool (47.7%). The settled agriculturalist also have pattern of tool used almost similar where employment of land preparation tool (78.3%) is the highest followed by Forest clearance (63.6%), Harvesting tools (56.8%) and weeding tools (48.3%). The employment of irrigation tools is almost absent. This is mainly because of the lack of capital as most of the samples are taken in southern Mizoram where rate of development is lower. But some improvement in irrigation facilities could be observed during the fieldwork in some areas.

5.4.2 Number of Tools Used by the Cultivators

The lack of agricultural tools is a major problem in Lunglei district which clearly shows lower development in agriculture as compared to other districts (GOM 2014). There are 13 tools used by the shifting cultivators and 16 tools used by the settled agriculturalist in the present study area. The number of tools owned in the present study is presented across the classification of tools made in the previous sub section viz., Forest clearance tools, Weeding tools, harvesting tools and Irrigation tools (see Table 5.10).

Moreover the tools owned are more among the settled agriculturalists except in harvesting tools. This is mainly due to existence of mono cropping among the settled agriculturalist which requires lesser types but more number of tools. Employment of machine like tractor, power tiller, mechanical weeding machines are almost absent but settled agriculturalists started using it but were still very few due to financial constrain.

The pattern of number of tools is different among both the shifting and settled cultivators. The shifting cultivators use forest clearance tools (4.2) as the highest followed by the weeding tools (4.0), Land preparation tools (1.9), harvesting tools (1.1) and irrigating tools are absent. In the mean time a different pattern is seen among the settled agriculture where the proportion of use of forest clearance tool (3.9) is the highest followed by land preparation tool (2.1), weeding tools (1.0), harvesting tools (0.9) and irrigating tools are absent.

5.5 Input Use

Many Economists believe that the level of productivity, production and income of the cultivator is determined by pattern of inputs used in cultivation. Input use has a series of impact on agriculture and agricultural production declined primarily due to reduced inputs and credit supplies especially in settled agriculture (Moyo, 2011). Increased input also increases production in both type of farming (Khan, 1983). Sachchidananda (1989) observed the changing patterns of input use in terms of increase in use of chemical inputs, human labour and animal power as the transformation from shifting cultivation to settled agriculture takes place. Agricultural output declined primarily due to reduced inputs and credit supplies, and natural calamities (Moyo 2011).

The input use among the respondent households in the present study is analysed in terms of use of Seeds, Human Labour, Animal Labour, Machinery, Manure, Pesticide and Irrigation (see Table 5.11).

5.5.1 Seeds

Seed is a primary input. The seeds used by the respondents in the present study are mainly categorised into Local Seeds and High Yielding Variety Seeds (HYV).

The Local seeds (2.2) are used more frequently than the HYV (0.8) seeds among both the type of cultivators. The frequency of use of local seeds is significantly higher among the shifting cultivators (2.5) as compared to the settled agriculturalist (2) which is mainly because of the unavailability of HYV seeds and lack of technical knowhow to cultivate High Yielding Variety Seeds. The use of High Yielding Variety Seeds is comparatively more among the settled agriculturalists (0.9) as compared to shifting cultivators (0.5) which are mainly from the supply of government and from the market. The same finding was observed in Aizawl district of Mizoram by Lalenzama (2011). In the process of switchover, the mizo farmers change the type of crops from local to Hybrid seeds which they believe as more productive and easy to look after which is strongly emphasised by the government departments especially agriculture department and horticulture department in their own areas.

5.5.2 Human labour

Human labour is an inevitable input in cultivation whether the form of it is shifting or settled. Human labour among the respondent households in the present study is categorized into male hired labour, female hired labour, male family labour and female family labour (see Table 5.11).

There no significant change in the frequency as well as pattern of human labour use. Contrary to reports in the increase in the human labour use due to transition from shifting cultivation to settled cultivation, there is no significant difference in the frequency of use of male hired labour, female hired labour, male and female family labour. On the whole, the male hired labour use was greatest which is followed by the female labour use, use of female family labour, and male family labour. The same pattern could be observed across the shifting cultivators and settled cultivators.

On the whole, the frequency of employment of male hired labour (1.4) is the greatest followed by female hired labour (0.8), male family labour (0.6) and female family labour (0.6) among both the cultivators viz., shifting and settled cultivators. The frequency of employment of male hired labour is similar among the shifting cultivators (1.4) and the settled agriculturalist (1.4). The frequency of employment of female labour is slightly higher among the shifting cultivators (0.9) as compared to the settled agriculturalists (0.8) as the female members have more work in jhum cultivation especially in weeding and harvesting. The employment of male and female family labour is higher among the shifting cultivators as compared to the settled agriculturalist which indicated that more input in the form of labour is required in shifting cultivation. Moreover Mizo had a traditional way of helping each other in Jhum cultivation called '*In Lawm*' where services are rendered to each other and this increases the number of employment of free labour.

5.5.3 Animal Labour

Animal labour use in agriculture is a major feature of settled cultivation in India. Animals especially bulls and buffaloes are used in agricultural operations such as ploughing, threshing and transportation of harvest and inputs. The question here is whether the use of animal labour emerges in the settled cultivation (see table 5.11).

Employment of animal labour is absent among both the shifting cultivators and the settled agriculturalists in the present study area. This is mainly because the area of land holding in the area of study is small and the terrain is slope which restricts the use of animal labour to some extent.

5.5.4 Employment of machines

Use of machines in agriculture is a modern phenomenon which is believed to enhance production and reduce the cost of production. The employment of machinery by

the respondents in the present study is categorised into owned and hired. The results of analysis of data shows that the employment of machinery is absent among the shifting cultivators but a few among the settled agriculturalists have started using it. This shows that the employment of machinery emerges among the settled agriculturalists in southern Mizoram.

5.5.5 Manure

Timely access to fertilizer emerges as one of the most forceful determinants of yields and their consistency (Arslan.et.al. (2015). Commercial certified organic agriculture has spread to over 130 countries worldwide and demand for organic pesticides is driven by belief that organic pesticides are more healthy, tasty, and environmentally friendly than conventional products (Lotter, 2008). Hence, the manure used by respondents in the present study has been categorised into Organic Manure, Chemical Fertilizers (major ones viz., NPK) and Chemical Fertilizers (Minor) (see Table 5.11).

There is no difference in the pattern of manure use between the shifting cultivators and settled cultivators, the latter significantly use the organic and chemical fertilisers in greater frequency as compared to the former type of farmers. On the whole, use of Organic fertilizers (0.4) as an input among the respondents is the highest which is followed by Chemical Fertilizers (NPK) (0.2) and Chemical Fertilizers (Minor) (0.2). Use of organic fertilizer is significantly higher among the settled agriculturalist (0.5) as compared to the shifting cultivators (0.2). The use of NPK Chemical Fertilizers and Minor Chemical Fertilizers are also higher among the settled agriculturalist which indicated that sedentary form of cultivation requires more input in terms of manure.

One very promising finding is the use organic manure (0.4) is the highest among all the fertilizers and even the government of India allocated Rs 100 crores with a view to develop commercial organic farming in the North Eastern Region (GOI, 2015). Although

the use of manure is observed, the rate of using yield increasing inputs especially manure and pesticides per hectare were still very less as compared to other cultivators in India and they were less significant in the process of transformation (Thiesenhusen, 1974; Schweiser 2006). Minimum soil disturbance and crop rotation have no significant impact on these yield outcomes (Arslan et al. 2015). The input of chemical and organic fertilizers requires capital which is a problem for the shifting cultivators and Jhum requires very minimum manure and without it the farming system also can somehow survive. Moreover scarcity of continuous supply also decreases the frequency of use. The application of organic fertilizers in sustainable agriculture systems improves yield sustainability of field crop production and changing over to sustainable agriculture by organic product can truly bring in development for the farmers and the nations with environmental security (Hajghani et al, 2014; Luetchford and Pratt, 2011).

5.5.6 Pesticides

Pesticide use in Agriculture is practiced in India for centuries but use of the poisonous chemical pesticide is a modern trend fuelled by agricultural extension agencies. The pesticide used by respondent households in the present study is categorised into organic pesticides and chemical pesticides.

In the pattern and frequency of use of pesticides there is no significant difference between the shifting and settled cultivators. Both organic and chemical pesticides are used rarely. On the whole, both the farmers used Organic pesticides (0.5) and chemical pesticides (0.5) equally. The use of organic pesticides is higher among the settled agriculturalist (0.3) as compared to the shifting cultivators (0.2). The use of chemical pesticides is also higher among the settled agriculturalist (0.3) than the shifting cultivators (0.2). The data might show low rate of input in terms of pesticides among the farmers it is

indicative of the fact that use of pesticides has no much effect and contribution in agrarian transformation in Mizoram.

5.5.7 Irrigation

Production in settled agriculture depends heavily on irrigation (Ajami 2005). There are some who argued that high levels of irrigation and mechanization have ensured high incomes from the cultivation (Kannan, 2015). The inputs use in irrigation in the present study has been categorised into dependence on rainfall, rain water harvesting and water from river (see Table 5.11).

In the pattern and frequency of use of various sources of irrigation viz., rainfall, rain water harvesting, and river water are not significantly different between the shifting and settled cultivators. Both of them mostly depend on rail fall and use rarely practice the rain water harvesting or using river water. The dependence on rainfall (2.9) is still the highest among both the farmers followed by rain water harvesting (0.1) and water from river (0.1). The dependence on rainfall is same among the shifting cultivators (2.9) and the settled agriculturalist (2.9). Although some rain water harvesting mechanism was introduced among the settled agriculturalist, the process of agrarian transformation in Mizoram lack improvement in irrigation which is vital for the development of agriculture especially sedentary form.

5.6 Perception on Ecological Consequences

Shifting cultivation has negative impact on the environment although it is the main socio-economic activity of the tribal people (Sati and Rinawma, 2014). Many believe that if the jhum cultivation continues in its present form then land degradation, ecological balance, deforestation, soil loss and fertility, destabilization of slopes may

happen and the impoverished living conditions of the shifting cultivators (Das and Das 2014).

The pre-tested perceived ecological consequences of shifting cultivation among the cultivators in the present study are rated by the farmers as Agree, Disagree, Strongly Agree and Strongly Disagree across seven different problems viz., soil erosion, loss of top soil, loss of forest, fire accidents due to Jhum fire, water retention capacity of soil is reduced, reduces rainfall, loss of wild animals, birds and insects (see Table 5.12).

There is no significant difference in the farmers' perceptions on the whole. The farmers agreed to the ecological consequences (3.2) mentioned in the present study and they are all aware of it. Both the shifting cultivators (3.1) and the settled agriculturalist (3.2) agreed on certain problems such as Soil Erosion, Loss of Forest, Fire accidents, Reduced Water retention capacity, Reduces rainfall, Loss of wild animals. The opinion and perceived ecological consequences of the farmers shows that in the process of agrarian transformation one of the main reasons of switchover is due to the awareness on ecological consequences.

The present study highlights how far the farmers perceive the ecological consequences of the shifting cultivation reported by natural and social scientists alike such as loss of wild animals birds and insects (see Buchi 1997), soil erosion (see Singh et al 2000; Agarwal 1985; Patnaik 1982; Majumdar 1947; Das (1976), loss of forest cover (Chatterjee 1993), reduction of water retention capacity of soil, reduced rainfall (see Buchi 1997), fire accidents due to Jhum (Jha 1997). Jhum farmers are aware of the harmful effects of shifting cultivation as it depletes and degrades soil besides other environmental problems. They know the need to stop shifting cultivation from the experience of decreasing crop yield over time. Despite this knowledge, however, they have continued Jhum farming partly due to historical reasons and partly due to poverty

related reasons such as lack of settled agricultural field, irrigation facilities, remoteness, high cost of labour and energy inputs involved in terrace cultivation, and absence of other viable alternatives to shifting cultivation and technical knowhow (Das and Das 2014; Miah and Islam 2007).

5.7 Agrarian Transformation

In the previous sections, the Agrarian transformation due to the transition from shifting cultivation to settled agriculture has been probed in terms of five interrelated aspects of agrarian structure viz., nature of land possession, ownership of livestock, cropping pattern, tools use, and input use. One important question that arises here is that how these aspects are related to each other. To answer this question, Karl Pearson's coefficient of correlation coefficients have been worked out (see Tables 5.13-5.15).

5.7.1 Distance to Head Quarters and Agrarian Transformation

The Distance of the villages to the District Head quarters has been reported as an important determinant of social change, transformation and development. The villages located in the proximity to the district head quarters are expected to have better infrastructure, amenities, facilities and thus better forward and backward linkages. Better access to resources and services is expected to contribute to greater level of development and socio economic transformation. The question here is that whether this proposition is true in respect of agrarian transformation in Mizoram.

Distance of the village to district head quarters has significant negative effect on the type of cultivation (-0.21). The distant villages have lesser proportion of settled cultivators as compared to that of the proximate villages.

Though distance of the villages to district head quarters has no significant relationship with area of land possessed and size of land holding, it has positive effect on

area of land under common land and has negative relation with the area of land possessed with LSC(-0.27). The distant villages have greater area of land under common land as compared to that of proximate villages. On the other hand, the proximate villages have greater area under LSC.

The distance of villages to district head quarters has negative impact on duration of land possessed by households under LSC(-0.15), while having no significant effect on the duration of land possessed by households under common land(0.00). However, it has positive relationship with duration of land possessed by households under PLP (0.24). Interestingly, the households in distant villages have greater duration of land possessed under PLP as compared to those in the proximate villages. On the other hand, the households in the proximate villages have greater duration of land under LSC.

The distance of the villages to district head quarters has no significant positive effect on the livestock ownership (0.01) of households and gross cropped area (-0.10) under cultivation. However, it has significant positive effect on the crop diversity (0.22). It is clear that the crop diversity is greater among the households in the distant villages as compared to the households in the proximate villages.

The distance of the villages to district head quarters has significant negative effect on the respondents perceived ecological consequences (-0.30) of shifting cultivation. The respondents in the proximate villages perceive greater extent of ecological consequences of shifting cultivation as compared to those in the distant villages.

The distance of the villages to district head quarters has significant positive effect of the frequency of local seeds use(0.28), use of chemical fertilizers NPK(0.18), and use of chemical fertilizers Minor(0.20). On the other hand, it has significant negative effects on the frequency of use of HYV seeds (-0.28) and organic manure (-0.19). It is clear that the cultivator households in the distant villages more frequently use local seeds, major

(NPK) and minor chemical fertilizers. On the contrary, the households in the proximate villages use more frequently HYV seeds and organic manure as compared to those in the distant villages.

5.7.2 Type of Cultivation and Agrarian Transformation

The present study probed in to the level of agrarian transformation by comparing the living condition of shifting cultivators and settled cultivators. The proportions of settled cultivators are more in the village near to the headquarters. The type of cultivation is having positive relationship with the area of land possessed. The computed t ratio value 0.17 shows that the type of cultivation is having significant relationship with area of land under LSC. In other word the area of land possession is more among the settled cultivator household. On the other hand the area of land under common land, area of land and size of land holding are not significant even at 5 percent level.

The type of cultivation of household in the present study also has significant relationship with the duration of land holding. The type of cultivation has significant relationship with the duration of land holding under PLP (0.17) and LSC (0.12). Land possession for agriculture occurs earlier among the household near to the district headquarters and among the settled cultivators. In the mean time the duration of land holding on common land (-0.52) is having negative relationship with the type of cultivation and in other words the duration of land holding under common land declines significantly among the settled cultivators.

Type of cultivation of the household in the present study also has significant negative relationship with the crop diversity index (-0.32) where the diversity of crop decrease among the settled cultivators. But surprisingly the gross cropped area (0.00) is not significant even at 5 per cent level.

The type of cultivation of household in the present study also has significant relationship with the input use. The use of local seeds (-0.23) has a negative significant relationship while the use of HYV (0.20) and organic manure (0.17) are positively related with the type of cultivation. In other words the use of local seeds declines among the settled cultivators while the use of HYV and organic manure increases significantly. On the other hand the use of minor and major (NPK) chemical fertilizers has no significant relationship with the type of cultivation.

5.7.3 Number of Plots Possessed and Agrarian Transformation

The number of plot possessed by the cultivators is an important determinant of level of agrarian transformation and the number of plot is expected to increase as the agrarian transformation takes place from shifting cultivation to settled agriculture. The number of plot possessed increase among the settled cultivators while it decreases among the cultivators in distant village.

The number of plot possessed by the cultivators in the present study is significantly related to the area of land possessed under LSC (0.30) and common land (0.20). Similarly the area of land holding (0.45) and size of land holding (0.54) are also significantly related to the number of plots. In other words the area of land under LSC and common land possessed by the cultivators increases with the increase in number of land possessed by cultivators. Similarly the area and size of land holding also increases significantly.

The number of plot possessed by the cultivators in the present study is significantly related to the duration of land holding under LSC (0.80) and PLP (-0.16). In other words the duration of land holding under LSC is more among the household who possessed more number of plots. On the other hand the duration of land holding under PLP decreases among the household who possessed more number of plot. The duration of

land holding on common land and ownership livestock are not significant even at 5 per cent level.

The number of plot possessed by the cultivators in the present study is significantly related to gross cropped area (0.65). On the other hand the crop diversity index (-0.03) is not significantly related to the number of plot possessed. In other words, when the number of land possession increase the gross cropped area increases but the diversity of crops is not increased.

The input use of the cultivators in the present study is not having a significant relationship with the number of plot possessed by the cultivators. The use of local seed (-0.16) have a negative relationship while the use of HYV (0.16) and organic manure (0.14) have positive relationship. In other words, the use of local seeds decline while the use of HYV and organic manure increases significantly when the number of plot possessed increases.

5.7.4 Area of Land Possessed and Agrarian Transformation

Area of land possession is an important indicator of the level of agrarian transformation in the present study and the area of land possession is expected to increase when the cultivators transformed to settled cultivation from shifting cultivation. The area of land possessed is more among the household in proximate area and also greater among the settled cultivators.

The area of land possessed under LSC is significantly related with the area of land possessed (0.81) and size of land holding (0.56). This clearly indicated that the area and size of land possessed is greater among the cultivator households who owned land under LSC.

The area of land possessed under LSC is significantly related to the duration of land holding under LSC (0.80) and PLP (-0.16). In other word the household owning land

under LSC have greater duration of land holding under LSC while the duration of land holding under PLP is less. The gross cropped area also has a significant relationship with the area of land possessed. It is natural that the household with more number area of land possessed have greater cropping area.

The area of land possessed under LSC has significant relationship with input use where use of HYV (0.16) and use of organic manure (0.14) are positively related significantly. On the other hand the use of local seed (-0.16) have negative significant relationship with the area of land possessed under LSC. In other word the household who owns land under LSC use greater HYV and organic manure and use of local seeds declined among them.

The area of land possessed under common land is significantly related with size of land holding (0.15), duration of land holding under PLP (-0.18) and common land (0.52). It also has significant relationship with gross cropped area (0.12) and crop diversity index (0.31). Input use such as use of local seeds (0.20) have positively related where use of HYV seed and use of organic fertilizers are negatively related to the area of land possessed under common land. In other words the household who owns common land are having larger area of land holding and the gross cropped area and crop diversity also increased. The use of local seed is more among the household who owns common land. In the mean time the use of HYV seed and organic manure declines among the household who owns common land.

5.7.5 Cropping Pattern and Agrarian Transformation

The gross cropped area increases among the household who have greater number and area of plot possessed. The gross cropped area has a significant relationship with crop diversity index (0.26). In other word the cropping pattern is more diversified among the household who has a greater gross cropping area.

The gross cropped area has a significant relationship with input use where use of HYV seed (0.16) and use of chemical fertilizer NPK (0.16) is significant at 5 percent level. When the cropping area increased the use of HYV seed and chemical fertilizers also increases. The use of local seed, organic manure and minor chemical fertilizer are not significant even at 5 per cent level.

Crops are more diversified among the household in the distant village and among the shifting cultivators household. Diversity of crops increased when the cropping area increased. Crop diversity index has a significant relationship with the input use where local seed (0.12) is significantly related at 5 per cent level. In the mean time the use of chemical fertilizer NPK (-0.18) is negatively significant. In other words increase in crop diversity let to greater use of local seed and decrease in use of chemical fertilizer NPK.

5.7.6 Input Use and Agrarian Transformation

Input use is believed to have effects on the rate of production in agriculture. The present study holds that use of local seed is higher among the households in distant villages and among the shifting cultivator households as discussed in the earlier chapter. Use of local seeds is significantly related to use of HYV seed (-0.81) where the use of HYV seed significantly declined among households who use more local seeds.

In this chapter an attempt has been made to discuss the patterns of agrarian transformation due to the transition from shifting cultivation to settled agriculture. Five major aspects of agrarian structure viz., nature of land possession, cropping pattern, livestock ownership, tools use, and input use have been discussed. In addition to them, the perception of the respondents on the ecological consequences of the shifting cultivation has also been discussed. Further, the interrelationship between the various aspects of agrarian transformation has also been discussed. In the next chapter, the various aspects

of tribal development are discussed. Also the bearing of the various aspects of agrarian structure on the tribal development are discussed.

ⁱ The Simpson Index of diversity is defined as:

$$SID = 1 - \sum_1 P_i^2$$

Where, P_i as the proportion of area under crop i . The value of SID always falls between 0 and 1. If there farmer cultivates just one crop, $P_i = 1$, so $SID = 0$. As the number of crops increase, the shares (P_i) declines, as does the sum of the squared shares, so that SID approaches to 1. If there are k sources of number of crops, then SID falls between zero and $1-1/k$. accordingly, households with most diversified number of crops will have the largest SID, and the less diversified number of crops are associated with the smallest SID. In computing the crop diversification, the classification of crop is used rather than single crops.

Table 5.1 Pattern of Land Possession: No. of Plots, Area and Duration

Sl. No	Indicator	Type of Cultivation				Total N = 282		't'
		Shifting n = 75		Settled n = 207		Mean	S.D	
		Mean	S.D	Mean	S.D			
I	Number of Plots of Land Possessed							
	Periodic Land Pass(PLP)	0.5 (33.9)	0.6	0.9 (65.3)	0.7	0.8 (56.2)	0.7	4.3**
	Land Settlement Certificate (LSC)	0.2 (10.7)	0.4	0.4 (27.9)	0.7	0.3 (23.0)	0.6	2.7**
	Common Land (CL)	0.9 (53.7)	0.3	0.1 (6.7)	0.3	0.3 (20.3)	0.5	17.8**
	Temporary Pass (TP)	0.0 (1.7)	0.2	0.0 (0.0)	0.0	0.0 (0.5)	0.1	1.7
	Number of Plots	1.6 (100)	0.6	1.4 (100)	0.7	1.5 (100)	0.7	2.0*
II	Area of Land Possessed (Area in Tins)							
	Periodic Land Pass(PLP)	1.5 (28.6)	1.9	3.6 (56.9)	3.4	3.1 (50.4)	3.2	5.2**
	Land Settlement Certificate (LSC)	0.7 (14.4)	2.0	2.6 (40.5)	5.5	2.1 (34.5)	4.9	2.8**
	Common Land (CL)	2.9 (57.0)	1.8	0.2 (2.6)	0.6	0.9 (14.8)	1.6	19.8**
	Temporary Pass (TP)	0.0 (0.0)	0.0	0.0 (0.0)	0.0	0.0 (0.0)	0.0	NA
	<i>Area of Land Possessed</i>	5.1 (100)	2.8	6.4 (100)	6.0	6.1 (100)	5.3	2.4*
III	Duration of Land Possessed (in years)							
	Periodic Land Pass(PLP)	6.2	8.6	9.9	10.1	8.9	9.9	2.8**
	Land Settlement Certificate (LSC)	2.4	5.9	4.9	10.4	4.2	9.4	1.9*
	Common Land (CL)	1.1	1.4	0.1	0.3	0.4	0.9	10.2*
	Temporary Pass (TP)	0.0	0.0	0.0	0.0	0.0	0.0	NA

Source: Computed

Figures in parentheses are percentages

** P < 0.01

* P < 0.05

Table 5.2 Source of Land

Sl.No		Type of Cultivation		Total N=282
		Shifting n = 75	Settled n =207	
I	Land Settlement Certificate (LSC)			
	No Land Possessed	62 (82.7)	143 (69.1)	205 (72.7)
	Village Council	5 (6.7)	46 (22.2)	51 (18.1)
	Purchased	8 (10.7)	18 (8.7)	26 (9.2)
II	Periodic Land Pass (PLP)			
	No Land Possessed	40 (53.3)	48 (23.2)	88 (31.2)
	Village Council	28 (37.3)	143 (69.1)	171 (60.6)
	Purchased	7 (9.3)	16 (7.7)	23 (8.2)
III	Temporary Pass (TP)			
	No Land Possessed	74 (98.7)	207 (100)	281 (99.6)
	Village Council	1 (1.3)	0 (0.0)	1 (0.4)
IV	Common Land (CL)			
	No Land Possessed	9 (12.0)	188 (90.8)	197 (69.9)
	Village Council	66 (88.0)	19 (9.2)	85 (30.1)

Source: Computed

Figures in parentheses are percentages

Table 5.3 Pattern of Distribution of Land across Size of Land Holding Classes

Sl.No	Size of Land Holding	Type of Cultivation				Total N = 282	
		Shifting n = 75		Settled n = 207		Number	Acres
		Number	Acres	Number	Acres		
1	Marginal(Below 2 Acres)	11 (14.7)	21 (5.5)	35 (16.9)	68 (5.1)	46 (16.3)	89 (5.2)
2	Small(2 - 5 Acres)	40 (53.3)	169.5 (44.1)	110 (53.1)	470 (35.5)	150 (53.2)	640 (37.5)
3	Medium(5 - 10 Acres)	21 (28.0)	150 (39.0)	38 (18.4)	318 (24.0)	59 (20.9)	468 (27.4)
4	Large(10 Acres and Above)	3 (4.0)	44 (11.4)	24 (11.6)	467 (35.3)	27 (9.6)	511 (29.9)
	<i>Mean Size of Land Holding</i>	5.1 ± 2.8	385 (100)	6.4 ± 6.0	1323 (100)	6.1 ± 5.3	1708 (100)
	Sample Gini coefficient	0.271279		0.397311		0.372066	

Source: Computed

Figures in parentheses are percentages

Mean ± SD

Table 5.4 Pattern of Livestock Ownership

(Value in Rupees)

Sl. No	Livestock	Type of Cultivation				Total N = 282		‘t’
		Shifting n = 75		Settled n = 207		Mean	S.D	
		Mean	S.D	Mean	S.D			
1	Pigs	6453 (62.0)	17284	6420 (52.8)	11801	6429 (55.0)	13445	0.02
2	Cow	1600 (15.4)	11745	3865 (31.8)	35315	3262 (27.9)	30848	0.54
3	Poultry	2277 (21.9)	8818	1469 (12.1)	3203	1684 (14.4)	5303	1.13
4	Fish	0 (0.0)	0	290 (2.4)	2591	213 (1.8)	2222	0.97
5	Goat	16 (0.2)	139	121 (1.0)	776	93 (0.8)	670	1.16
6	Horse	67 (0.6)	577	0 (0.0)	0	18 (0.2)	298	1.67
7	Total Value	10413 (100)	22170	12164 (100)	39406	11699 (100)	35615	0.36

Source: Computed Figures in parentheses are percentages ** P < 0.01 * P < 0.05

Table 5.5 Cropping Pattern: No. of Farmers

Sl. No	Crops	Type of Cultivation				Total N = 282		‘t’
		Shifting n = 75		Settled n = 207		Number	Percent	
		Number	Percent	Number	Percent			
1	Fruits	29	39	160	77	189	67	6.52**
2	Vegetables	68	91	62	30	130	46	10.68**
3	Cereals	72	96	55	27	127	45	13.1**
4	Tree Crops	13	17	78	38	91	32	3.28**
5	Oil seeds	1	1	33	16	34	12	3.38**
6	Pulses	1	1	1	0	2	1	0.75

Source: Computed Figures in parentheses are percentages ** P < 0.01 * P < 0.05

Table 5.6. Cropping Pattern: Number of Crops per Farmer

Sl. No	Crops	Type of Cultivation				Total N = 282		't'
		Shifting n = 75		Settled n = 207		Mean	S.D	
		Mean	S.D	Mean	S.D			
1	Vegetables	5.8 (70.2)	3.0	0.8 (24.5)	1.7	2.2 (46.2)	3.1	17.34**
2	Fruits	0.5 (6.6)	0.8	1.5 (44.4)	1.2	1.2 (26.4)	1.2	6.34**
3	Cereals	1.7 (20.7)	0.6	0.4 (10.6)	0.6	0.7 (15.4)	0.9	16.4**
4	Tree Crops	0.2 (2.2)	0.4	0.5 (15.5)	0.8	0.4 (9.2)	0.7	6.00**
5	Oil Seeds	0.0 (0.2)	0.1	0.2 (4.8)	0.4	0.1 (2.6)	0.3	3.55**
6	Pulses	0.01 (0.2)	0.12	0.00 (0.1)	0.07	0.01 (0.2)	0.08	3.38**
7	Number of Crops	8.3 (100)	0.84	3.3 (100)	0.8	4.7 (100)	1.0	0.75

Source: Computed Figures in parentheses are percentages ** P < 0.01 * P < 0.05

Table 5.7. Cropping Pattern: Area under Cultivation

(Area in Acres)

Sl. No		Type of Cultivation				Total N = 282		't'
		Shifting n = 75		Settled n = 207		Mean	S.D	
		Mean	S.D	Mean	S.D			
1	Fruits	0.8 (16.5)	1.3	2.7 (52.9)	2.9	2.2 (43.2)	2.7	5.29**
2	Cereals	2.5 (49.4)	1.1	0.6 (11.3)	1.2	1.1 (21.4)	1.4	12.22**
3	Vegetables	1.4 (27.4)	0.8	0.5 (9.9)	0.9	0.7 (14.6)	1.0	7.21**
4	Tree Crops	0.3 (5.7)	0.7	0.9 (17.2)	1.5	0.7 (14.2)	1.3	3.28**
5	Oil Seeds	0.0 (0.5)	0.2	0.4 (8.4)	1.3	0.3 (6.3)	1.1	2.69**
6	Pulses	0.0 (0.5)	0.2	0.0 (0.3)	0.2	0.0 (0.4)	0.2	0.42
7	Gross Cropped Area	5.0 (100)	2.1	5.0 (100)	3.5	5.0 (100)	3.2	0.01
8	Crop Diversity Index	0.5	0.2	0.3	0.3	0.4	0.25	5.67**

Source: Computed ** P < 0.01 * P < 0.05

Table 5.8 Cropping Pattern: Purpose of Cropping

Sl.No	Crop/ Purpose	Type of Cultivation		Total N=282
		Shifting n = 75	Settled n =207	
I	Vegetables			
	Household Consumption	16 (21.3)	11 (5.3)	27 (9.6)
	Market Sales	7 (9.3)	37 (17.9)	44 (15.6)
	Both for Household and Market	45 (60.0)	14 (6.8)	59 (20.9)
II	Fruits			
	Market Sales	28 (37.3)	159 (76.8)	187 (66.3)
	Both for Household and Market	0 (0.0)	1 (0.5)	1 (0.4)
III	Cereals			
	Household Consumption	19 (25.3)	21 (10.1)	40 (14.2)
	Market Sales	1 (1.3)	5 (2.4)	6 (2.1)
	Both for Household and Market	52 (69.3)	29 (14.0)	81 (28.7)

Source: Computed

Figures in parentheses are percentages

Table 5.9 Pattern of Tools Used in Cultivation: No. of Farmers Using

Sl. No	Tool	Type of Cultivation				Total N = 282	
		Shifting n = 75		Settled n = 207			
		Number	Percent	Number	Percent	Number	Percent
1	Chempui	74	98.7	204	98.6	278	98.6
2	Hreipui	59	78.7	169	81.6	228	80.9
3	Chemsei	5	6.7	22	10.6	27	9.6
4	Thirtieng	58	77.3	162	78.3	220	78.0
5	Suahdur	55	73.3	162	78.3	217	77.0
6	Chemkawm	71	94.7	196	94.7	267	94.7
7	Tuthlawh	67	89.3	179	86.5	246	87.2
8	Dawrawn	57	76.0	132	63.8	189	67.0
9	Em	45	60.0	114	55.1	159	56.4
10	Favah	61	81.3	126	60.9	187	66.3
11	Empai	44	58.7	88	42.5	132	46.8
12	Paikawng	66	88.0	155	74.9	221	78.4
13	Thlam Em	33	44.0	91	44.0	124	44.0
14	Diesel Water Pump	0	0.0	1	0.5	1	0.4
15	Electric Water Pump	0	0.0	2	1.0	2	0.7
16	Power Tiller	0	0.0	0	0.0	0	0.0
17	Tractor	0	0.0	0	0.0	0	0.0
18	Mechanical Weeder	0	0.0	3	1.4	3	1.1
19	Drip Irrigation	0	0.0	0	0.0	0	0.0
20	Sprinkler Irrigation	0	0.0	0	0.0	0	0.0
	Type of Tools						
I	Forest Clearance Tools	46	61.3	132	63.6	178	62.6
II	Land Preparation Tools	57	75.3	162	78.3	219	76.9
III	Weeding Tools	36	47.7	100	48.3	136	47.8
IV	Harvesting Tools	51	68.0	118	56.8	169	59.4
V	Irrigation Tools	0	0.0	2	0.7	2	0.53

Source: Computed

Figures in parentheses are percentages

Table 5.10. Pattern of Tools Used in Cultivation: Number of Tools Used

Sl. No	Tool	Type of Cultivation				Total N=282	
		Shifting n = 75		Settled n =207			
		Mean	S.D	Mean	S.D	Mean	S.D
1	Chempui	2.9	1.2	2.8	1.5	2.8	1.4
2	Hreipui	1.2	0.9	1.0	0.7	1.1	0.7
3	Chemsei	0.1	0.4	0.1	0.5	0.1	0.5
4	Thirtieng	1.1	0.9	1.1	1.0	1.1	0.9
5	Suahdur	0.9	0.6	0.9	0.6	0.9	0.6
6	Chemkawm	2.1	1.1	2.1	1.0	2.1	1.1
7	Tuthlawh	1.8	1.0	1.7	1.1	1.7	1.1
8	Dawrawn	1.1	1.0	0.8	0.9	0.9	0.9
9	Em	0.9	1.1	0.9	1.1	0.9	1.1
10	Favah	2.1	1.3	1.5	1.6	1.6	1.5
11	Empai	0.6	0.6	0.5	0.7	0.5	0.6
12	Paikawng	1.2	0.7	1.0	0.8	1.1	0.8
13	Thlam Em	0.5	0.6	0.5	0.6	0.5	0.6
14	Diesel Water Pump	0.0	0.0	0.0	0.1	0.0	0.1
15	Electric Water Pump	0.0	0.0	0.0	0.1	0.0	0.1
16	Power Tiller	0.0	0.0	0.0	0.0	0.0	0.0
17	Tractor	0.0	0.0	0.0	0.0	0.0	0.0
18	Mechanical Weeder	0.0	0.0	0.0	0.1	0.0	0.1
19	Drip Irrigation	0.0	0.0	0.0	0.0	0.0	0.0
20	Sprinkler Irrigation	0.0	0.0	0.0	0.0	0.0	0.0
I	Forest Clearance Tools	4.2	0.9	3.9	0.9	1.3	0.9
II	Land Preparation Tools	1.9	0.7	2.1	0.7	1	0.7
III	Weeding Tools	4.0	0.7	1.0	0.7	1	0.7
IV	Harvesting Tools	1.1	0.9	0.9	0.9	0.9	0.9
V	Irrigation Tools	0.0	0.9	0.0	0.9	0	0.9

Source: Computed

Table 5.11. Pattern of Input Use in Cultivation: Frequency of Use

Sl. No.	Input	Type of Cultivation				Total N=282		't'
		Shifting n = 75		Settled n =207		Mean	S.D	
		Mean	S.D	Mean	S.D			
I	Seed							
	Local Seeds	2.5	0.7	2.0	0.9	2.2	0.9	4.0**
	High Yielding Seeds	0.5	0.7	0.9	0.9	0.8	0.9	-3.5**
II	Human Labour							
	Male Hired Labour	1.4	0.8	1.4	0.8	1.4	0.8	0.4
	Female Hired Labour	0.9	0.5	0.8	0.5	0.8	0.5	0.3
	Female Family Labour	0.7	0.6	0.5	0.5	0.6	0.5	1.7
	Male Family Labour	0.7	0.6	0.5	0.5	0.6	0.5	1.8
III	Animal Labour							
	Owned Animal Labour	0.0	0.0	0.0	0.0	0.0	0.0	NA
	Hired Animal Labour	0.0	0.0	0.0	0.0	0.0	0.0	NA
IV	Machinery							
	Owned Machinery	0.0	0.0	0.1	0.4	0.0	0.3	-1.3
	Hired Machinery	0.0	0.0	0.0	0.1	0.0	0.1	-0.9
V	Manure							
	Organic Manure(Specify)	0.2	0.4	0.5	0.8	0.4	0.7	-2.9**
	Chemical Fertilizers(NPK)	0.1	0.3	0.2	0.4	0.2	0.4	-1.7
	Chemical Fertilizers(Minor)	0.1	0.3	0.2	0.5	0.2	0.4	-2.0*
VI	Pesticide							
	Organic Pesticides	0.2	0.4	0.3	0.5	0.3	0.5	-1.6
	Chemical Pesticides	0.2	0.5	0.3	0.5	0.3	0.5	-1.0
VII	Irrigation							
	Dependence on Rainfall	2.9	0.4	2.9	0.6	2.9	0.5	1.0
	Rainwater Harvesting	0.1	0.3	0.1	0.4	0.1	0.4	-1.2
	River Water	0.1	0.2	0.1	0.4	0.1	0.4	-0.8

Source: Computed

** P < 0.01

* P < 0.05

Table 5.12. Perceived Ecological Consequences of Shifting Cultivation

Sl. No	Perception	Type of Cultivation				Total N=282		't'
		Shifting n = 75		Settled n =207		Mean	S.D	
		Mean	S.D	Mean	S.D			
1	Soil Erosion, loss of top soil	3.0	0.5	3.2	0.8	3.2	0.7	-1.61
2	Loss of Forest and destruction of trees	3.2	0.5	3.3	0.7	3.3	0.6	-0.87
3	Fire accidents due to Jhum Fire	3.1	0.6	3.3	0.7	3.3	0.6	-1.98*
4	Reducing soil water retention capacity	3.2	0.6	3.2	0.7	3.2	0.7	-0.21
5	Reduces rainfall	3.0	0.7	3.1	0.8	3.1	0.8	-0.61
6	Loss of wild animals, birds and insects	3.0	0.7	3.2	0.7	3.1	0.7	-2.64**
7	Ecological Consequences of Shifting Cultivation	3.1	0.5	3.2	0.6	3.2	0.6	-1.57

Source: Computed

** P < 0.01 * P < 0.05

Table 5.13 Agrarian Transformation: Zero Order Correlation Matrix

Variable	Indicator	Var01	Var02	Var03	Var04	Var05	Var06	Var07
Var01	Number of Plots	1	0.30**	0.20**	0.20**	0.45**	0.54**	-0.31**
Var02	Area of Land Possessed with LSC	0.30**	1	-0.11*	-0.10	0.81**	0.56**	0.03
Var03	Area of Land Possessed with PLP	0.20**	-0.11*	1	-0.30**	0.41**	0.40**	-0.09
Var04	Area of Common Land Possessed	0.20**	-0.10	-0.30**	1	0.03	0.16**	-0.31**
Var05	Area of Land Possessed	0.45**	0.81**	0.41**	0.03	1	0.79**	-0.11**
Var06	Size of Land Holding	0.54**	0.56**	0.40**	0.16**	0.79**	1	-0.21**
Var07	Crop Diversity Index	-0.31**	0.03	-0.09	-0.31**	-0.11*	-0.21**	1

Source: Computed

** P < 0.01 * P < 0.05

CHAPTER VI

TRIBAL DEVELOPMENT: LIVELIHOOD AND LIVING CONDITIONS

Development is social economic and political transformation that enhances the objective and objective aspects of human life. It is in fact a planned social change. The term 'development' is also used for the process of allowing and encouraging people to meet their own aspirations in areas of economic, social, political and administrative aspects (Basu, A.R.1985: 26). Development also means change plus growth (Colm and Geiger 1962). Development is a process of growth in the direction of nation building and socio-economic progress which stands for transformation of society (Chaturvedi 1978; Weidner 1970; Chi Yum 1978). It is a multi-dimensional process, and it involves changes in structure, attitudes and institutions as well as the acceleration of economic growth, the reduction of inequality and the eradication of absolute poverty (Todaro 1977). The Constitution of India entrust the State to promote special care of the educational and economic interest of the scheduled tribes and to protect them from social injustice and exploitation. Their development is a special responsibility of the President of India and the Governors are responsible for reviewing the administration and development of tribal areas (GOI 2015).

In the context of socio culturally and economically diverse tribal people and areas, tribal development could be conceived as process of transformation in their economic and socio political life that enhances the livelihood assets and living conditions. Hence in this chapter, results of analysis of tribal development have been discussed in terms of patterns and levels of livelihood assets and living conditions.

This chapter is presented in four major sections viz., Pattern of tribal livelihood, Patterns of Living Conditions, Patterns of Relationship between Livelihood and Living

Conditions, Patterns of Relationship between Agrarian Transformation and Tribal Development.

6.1 Patterns of Tribal Livelihood

In the Sustainable Livelihood Framework, a livelihood asset served as the basis for people's survival, sustenance and development which includes different forms of capital such as human capital, natural capital, physical capital, financial capital and social capital (DFIB 2000; Carney 1998; Chambers and Conway 1992). Drawing inspiration from the SLF, Tribal livelihood assets among the respondents in the present study are classified as physical capital, financial capital and social capital. As land and livestock are discussed as part of agrarian transformation, they have been excluded. Education and human capital has also been excluded from analysis as the transition is not expected to have effect on them.

6.1.1 Physical Capital

Physical capital has been conceptualised as the amenities owned by the households. The pattern of physical capital in the tribal household is probed by describing the housing amenities of the respondents household which is categorised into Own House, Housing Plot with LSC, Ration Card, Electricity, Phone, Toilet, Gas Connection, Water Connection, Two Wheeler, Three Wheeler and Four Wheeler (see Table 6.1).

The physical capital endowment of the settled cultivators is significantly greater than that of the shifting cultivators. The computed t ratio for the difference between shifting and settled cultivators in housing amenities index (3.46) is significant at 1 percent level. The comparison of housing amenities Index between the shifting and settled cultivator shows that the amenities owned among the settled agriculturalist (0.57) is significantly higher as compared to the shifting cultivators (0.48).

There are significant differences in housing amenities between the shifting cultivators and settled cultivators in terms of housing plot with LSC (2.22), electricity (4.35), LP Gas connection (3.73), and water connection (2.15). As compared to the shifting cultivators, a significantly greater proportion of settled cultivators have the amenities such as own housing plot, electricity, LP Gas connection and water connection. However, there is no significant differences between the shifting and settled cultivators in the access to amenities like own house(1.26), ration card(0.07), phone(1.64), toilet(0.85), two wheeler(1.76), four wheeler(0.93), and three wheeler(0.6).

6.1.2 Financial Capital

The financial Capital of the respondents' households in the present study is probed into terms of household saving and household debt. The net difference between the household debt and saving is considered as financial capital of the households (see Table 6.2).

The forms of household saving of the respondents in the present study were categorised into Savings in Cash, Saving in Banks, Saving in Post Office and Saving in Self Help Group. On the other hand household debt has been reported by the respondents in aggregate terms.

There is no significant difference between the shifting cultivators and settled cultivators in their household financial capital endowment and in its both components household saving and debt. The computed t ratios for the difference between shifting and settled cultivators in financial capital(1.27), per capita financial capital(1.76), household saving(1.14), per capita household saving(1.68), household debt(1.30) and per capita household debt(0.59) are all not even significant at 5 percent level.

In the pattern of household savings, there is no difference between the shifting and the settled cultivators. On the whole, the major portion of the saving of the respondent

households is in the form of saving in the Banks (68%), which is followed by saving in cash (26%), saving in SHGs (4%), and saving in post office (2%). Among the shifting cultivators, the major form of savings is in the form of saving in the Banks (71%), which is followed by saving in cash (22%), saving in SHGs (6%), and saving in post office (1%). Similar pattern could be observed in the case of settled cultivators also.

Although the study made by Zaitinwawra and Kanagaraj (2008) indicate that there is no savings with self help group, money lenders, insurance company, but the present study observed upward change and highlight that saving started in the process of agrarian transformation in Mizoram.

6.1.3 Social Capital

The social capital of respondent households in the present study is conceptualised in terms of households' community participation and political participation. Community participation of the respondents' household in the present study is measured in terms of terms of frequency of participation of household in different community organisations viz., Church, Young Mizo Association (YMA), Youth Wing of Churches, Mizo Hmeichhe Insuihkhawm Pawl (MHIP), Games and Sports Association (G&SA), Self Help Group (SHG) and Mizo Upa Pawl (MUP). Four point scale with always (3), mostly (2), sometimes (1), and never (0) responses was used to measure the households participation in the meetings of these organisations. On the other hand, political participation of the households has been conceptualised in terms of voting behaviour of the members of the households in general, assembly and village council elections. A four point scale was used to measure these items. The four points were all (3), most (2), some (1), and none (0). Both the dimensions of social capital community participation and political participation were analysed for variations in pattern and level. For arriving at the

scores of the households in each of the component of social capital simple average was used (see table 6.3).

Social capital in terms of community participation is significantly greater among the settled cultivators as compared to shifting cultivators. On the contrary, in terms of political participation, there is no significant difference between them. The t ratio of community participation (1.96) is significant at 5 percent level while that of political participation (1.25) was not even significant at 5 percent level. Community Participation is significantly higher among the Settled Agriculturalist (1.4) as compared to the Shifting Cultivators (1.3). As the settled cultivators are economically better their participation level is also higher than the shifting cultivators. Moreover, the activity in shifting cultivation is continuous almost the entire year and on the other hand the settled cultivator had more time as weeding is the only main activity in a year.

However, between the shifting and settled cultivators no significant difference could be observed in their participation in the meetings of Church, YMA, MHIP, GS&A, SHGs and MUP. Only in case of the participation in Youth wing of Church the participation is significantly greater among the settled cultivators as compared to the shifting cultivators.

As regards the pattern of community participation, no difference could be noted between the shifting and settled cultivators. On the whole, the participation in church (2.4) is the highest followed by YMA (2.0), Youth wing of church (1.8), MHIP (1.5), G&SA (0.9), SHGs (0.8) and MUP (0.5). The patterns of participation among the shifting cultivation and the settled agriculturalist are similar.

Voting and involvement in election campaign are the main ways of political participation for the rural farmers in Mizoram. Participation as a leader is mainly at the level of Village Council. Political Participation of the respondents' household in the

present study was probed into by analysing voting in general elections, voting in legislative assembly and voting in village council (see Table 6.3).

In political participation, there is no significant difference between the shifting and settled cultivators in frequency as well as pattern. On the whole, the political participation in terms of voting in village council (2.6) is the highest followed by voting in assembly election (2.5) and voting in general election (2.2). The patterns of political participation of the shifting and settled cultivators are similar to that of the overall pattern.

6.2 Patterns of Living Conditions

How far the transformation in the agrarian structure has contributed to change in the living conditions at household level is the major question that arises here. To answer this question, the pattern of living conditions of respondent households is analysed in terms of variation in the pattern and level of household income and household expenditure (see Table 6.4).

6.2.1 Pattern of Household Income

Household Income is the first indicator of the standard of living of the family. It is observed in terms of annual income accrued to the household from the sources like crop husbandry, labour, business, animal husbandry, government service and other sources. The aggregate income, per capita income and diversity of income were analysed for difference (see Table 6.4).

The Annual Household Income is significantly higher among the settled agriculturalists (Rs 83,290) as compared to the shifting cultivators (Rs 51,960). Similarly, the annual per capita income of the household income of the former (Rs 20997) is significantly greater than that of the shifting cultivators (Rs 11997). The computed t ratio for difference between the shifting cultivators and settled agriculturists in annual

household income (2.92) and per capita annual household income (3.41) are significant at 1 percent level.

The difference in household income between the shifting and settled cultivators is mainly because of the latter's greater income from crop husbandry. And there is no significant difference between the shifting cultivators and settled cultivators in their household income from labour, business, animal husbandry, government service, and other sources.

In the pattern of household income, only a marginal difference could be observed between the shifting and settled cultivators. On the whole, the main concentration of Annual Household Income is from Crop Husbandry (64%) as almost all the respondents selected are cultivators. Surprisingly labour (18%) contributed the second highest followed by Business (7%), Animal husbandry (7%), Government Service (5%) and Other Sources (0.2%) which includes assistance and irregular income of families. The pattern of household income among shifting cultivators shows that income from crop husbandry (64%) contribute the highest followed by Labour (24%), Animal husbandry (5%), Government service (4%) and Business (3%). The pattern is different among the settled agriculturalist where crop husbandry (63%) contribute the highest followed by Labour (16%), Business (8%), Animal husbandry (7%) and Government service (5%).

As there is no significant difference in the pattern of household income, no significant difference in the income diversity could be observed between the shifting and settled cultivators. The computed t ratio for the difference in income diversity index (1.43) was not significant even at 5 percent level. The income diversity index for the shifting cultivators was worked out to 0.42 while it was 0.44 for the settled cultivators.

The results of the analysis of household income of the shifting cultivators and settled cultivators show the significant difference and increase the same due to the

transition from shifting cultivation to settled cultivation. This result is contrary to the findings reported in an earlier study by Zaitinvawra and Kanagaraj (2008). However, this is in tune with the finding of the study by Chawngthu and Kanagaraj (2013). However, this finding is contradictory to that was reported by Chawngthu and Kanagaraj (2013) that the transition results in livelihood or income diversification.

6.2.2 Pattern of Household Expenditure

The pattern of household expenditure is the second indicator of the standard of living of the tribal households studied. The monthly household expenditure of the respondent households was observed in terms of a number of items viz., food, donations, transport, medication, clothing, phone, electricity and water. The monthly household expenditure and per capita household expenditure were also analysed to see the difference between the shifting and settled cultivators (see Table 6.5).

The Per capita Monthly Household Expenditure is significantly higher among the settled agriculturalist (Rs 1,644) as compared to shifting cultivators (Rs 1,175). The monthly household expenditure is also significantly higher among the settled cultivators (Rs 6,745) as compared to that of shifting cultivators (Rs 5,022). The computed t ratio on monthly household expenditure (2.4) and per capita monthly household expenditure (3.3) are significant at 5 per cent levels. Similar result was reported by Chawngthu and Kanagaraj (2013) in the context of Mizoram.

However, there is no significant difference between the shifting and settled cultivators in the pattern of monthly household expenditure. Most of the monthly household expenditure was incurred on non-food (68%) while less than one third of that was incurred on food (32%). On the whole, the pattern of monthly household expenditure is concentrated mainly on food (32%) and donation in the church and NGOs (26%) is also relatively high which shows that the participation in community requires more

expenditure to do so, which is followed by expenditure on Transport (15%), Medication (10%), Clothing (8%), Phone (4%), Electricity (3%) and Water (1%). The expenditure on water is comparatively low among the shifting cultivators as many of them still depend on spring well and do not have water connection. This finding is contradictory to the pattern of household expenditure by Chawngthu and Kanagaraj. They have reported significant difference in the pattern of household expenditure. The greater share of non-food expenditure was found among the shifting cultivators while food expenditure constituted the greatest share of household expenditure.

6.3 Tribal Livelihood and Living Conditions

In the present study, tribal development is assessed in terms of livelihood and living conditions. Tribal livelihood is assessed in terms of physical capital(housing amenities index), and Financial Capital(per capita household saving and per Capita household debt), social capital(community participation, political participation) while living conditions are assessed in terms of Per Capita Income, Income Diversity Index, and Per Capita monthly households expenditure . In the present study, the major focus is on the contribution of agrarian transformation to tribal development. It is essential to understand the pattern of relationship among the indicators of livelihood, living conditions and between them. Karl Pearson's product moment correlation coefficients were used to understand the pattern of relationship within and between the indicators of livelihood and living conditions.

The relationship of the indicators of tribal livelihood viz., Housing amenities index, and Financial Capital(per capita household saving and per Capita household debt), social capital (community participation, political participation) and indicators of tribal living conditions viz., Per Capita Income, Income Diversity Index, and Per Capita

monthly households expenditure was analysed using Karl Pearson's product moment coefficients of correlation(see table 6.6).

6.3.1 Relationship among Indicators of Tribal Livelihood

The tribal livelihood is assessed in terms of physical capital (housing amenities index), and Financial Capital (per capita household saving and per Capita household debt), social capital (community participation, political participation). The pattern of relationship among them is discussed in this subsection.

As expected, a significant positive relationship was observed among the different forms of capital endowments of households, viz., physical capital (housing amenities index), financial capital and social capital. The correlation coefficients of housing amenities with financial capital (0.34), per capita household saving (33), community participation (0.40) were all positive and significant at 1 percent level. Likewise, the financial capital is having significant positive relationship with household saving (0.94), and community participation (0.16). However, physical capital (housing amenities index), has no significant relationship with per capita household debt (0.02) and political participation (-0.07). Similarly, financial capital is not having significant relationship with one of its components household debt (0.05). Likewise, community participation a measure of social capital does not have significant relationship with per capita saving (0.13) or debt (-0.13). Another measure of social capital does not have significant relationship with any of the forms of capital physical, financial, or social. Its correlations with housing and amenities (-0.07), financial capital (0.04), per capita saving (0.09), per capita debt (0.03), and community participation (-0.02) are not significant even at 5 percent level.

6.3.2. Relationship among Indicators of Living Conditions

Tribal living conditions constitute the second set of indicators of tribal development. The indicators of tribal living conditions are per capita income, income diversity index, and per capita monthly household expenditure. Karl Pearson's coefficients of correlation were used to probe into the relationship among them (see table 6.6).

As expected, the per capita household income and expenditure have significant positive relationship between them (0.61). Contrary to expectations, livelihood diversification (income diversity index) has significant negative effect on the household income (-0.13) while having no significant effect on the household expenditure (-0.02).

6.3.3. Relationship between Tribal Livelihood and Living Conditions

Most of the components of the tribal livelihood assets have significant positive effect on both the indicators of tribal living conditions viz., per capita income and per capita monthly household expenditure. Physical capital, financial capital, and social capital have positive effect on per capita income and per capita monthly household expenditure. Physical capital (housing and amenities) has significant positive effect on per capita income (0.30), per capita monthly household expenditure (0.33). Likewise, financial capital and one of its components per capita household saving have significant positive effect on per capita household income (0.61) and per capita household expenditure (0.50). However, per capita household debt does not have significant relationship with household income (0.11) or per capita household expenditure (0.06). Community participation does not have any significant effect on the household living condition indicators viz., per capita income (0.05), per capita monthly expenditure (0.04). On the other hand another indicator of social capital, political participation has significant positive effect on per capita income (0.18) and monthly expenditure (0.12).

However, in terms of livelihood diversification, only physical capital and social capital have significant negative effect. The housing amenities index and community participation have significant negative effect on the per capita income and expenditure. On the other hand, financial capital does not have any effect on the income diversification of the household.

6.4. Agrarian Transformation and Tribal Development

In the previous sections, the patterns of tribal livelihood, patterns of living conditions and the relationship between them are discussed. One important question that arises here is that how these aspects of agrarian transformation are related to tribal development. To answer this question Karl Pearson's coefficient of correlation has been worked out (see table 6.7).

The agrarian transformation is discussed in terms of distance to headquarters, type of cultivation, number of plots, areas of land possessed, duration of land possessed, livestock value, gross cropped area, crop diversity index, and input use. On the other hand the tribal development indicators probed into the present study is discussed under housing amenities index, financial capital, per capita household saving, per capita household debt, community participation, political participation, per capita income, income diversity index, and per capita monthly household expenditure.

6.4.1 Distance to Headquarter and Tribal Development

Distance to headquarter is significantly related with tribal livelihood and living condition.

It is having negative effect on livelihood assets viz., physical capital (housing amenities index) (-0.12), and financial capital (-0.13). Similarly, it has negative effect on both the indicators of living conditions viz., per capita income (-0.27), and per capita monthly

household expenditure (-0.18). In other words the households in the distant villages have significantly lesser physical and financial capital as compared to those who live in proximate villages. Their per capita income and financial capital are also lower among those households in distant villages as compared to those live in villages proximate to the district head quarters. On the other hand distance to headquarter is not significantly related to per capita household saving, per capita household debt, community participation, political participation, income diversity index, and per capita monthly household expenditure even at 5 percent level.

6.4.2 Type of Cultivation and Tribal Development

The type of cultivation is significantly related to tribal livelihood and living conditions. It has positive effect on tribal livelihood in terms of physical capital (housing amenities index) (0.20), and Social capital (community participation) (0.12), while it does not have any significant effect on financial capital. Similarly, it has significant positive effect on both the indicators of living conditions viz., per capita income (0.20) and per capita expenditure. In other words, the settled cultivator households are having better livelihood in terms of housing amenities, and frequency participation in the community activity is also higher as compared to the sifting cultivator households. The living condition of the settled cultivators is better in terms of per capita income and per capita household expenditure than those of the shifting cultivators.

On the other hand, the type of cultivation is not significantly related to financial capital, per capita household saving, per capita household debt, political participation, income diversity index, and per capita monthly household expenditure even at 5 percent level. In other words, there are no significant differences between the shifting and settled cultivators in financial capital.

6.4.3 Number of Plot of Land possessed and Tribal Development

The number of plot of land possessed by households has significant positive effect on tribal livelihood and living condition. It has significant positive effect on the livelihood assets viz., physical capita (housing amenities index) (0.27), financial capital (0.26), per capita household saving (0.25), social capital (community participation) (0.16). Similarly it has significant positive effect on the living condition in terms of per capita monthly household expenditure (0.17) only. In other words, as the number of plots possessed by the household increases the volume of physical, financial and social capital also increases.

On the other hand, the number of plots of land possessed is not significantly related to per capita household saving, political participation, per capita income, and income diversity index even at 5 percent levels.

6.4.4 Area of Land Possessed and Tribal Development

The area of land possessed is the second set of indicator of agrarian transformation. There are four indicators of area of land possessed analysed for their effect on tribal livelihood and living conditions. They are the area under LSC, Common land, total area of land possessed and size of land holding.

The area of land possessed and size of land holding have significant positive effects on the tribal livelihood and living conditions. The area of land possessed has significant positive effect on the various livelihood assets viz., physical capital (housing amenities index) (0.44), financial capital (0.36), per capita household debt (0.36), social capital (community participation) (0.32). It also positively impacts the living conditions of the households in terms of per capita income (0.27) and expenditure (0.32).

Area of land possessed under LSC has significant positive effect on livelihood and living conditions while area of land possessed under common land has negative effect. Area of land under LSC has positive effect on physical, financial and social capital. It similarly impacts the living conditions of the households in terms of household income

and expenditure. The area under common land has negative effect on physical capital while having no such effect on financial or social capital endowments of the households. Yet it has significant negative effect on both the indicators of living conditions viz., per capita income (-0.18) and expenditure (-0.16).

6.4.5 Livestock Ownership and Tribal Development

Contrary to expectation, livestock value does not have any significant effect on the livelihood assets viz., physical, financial, and social capital. But it has significant positive effect on one of the indicators of living conditions viz., per capita monthly expenditure.

6.4.6 Cropping and Tribal Development

Two indicators of cropping viz., gross cropped area and crop diversity index were analysed for their effects on the tribal livelihood and living conditions. The gross cropped area has significant positive effect on tribal livelihood and living condition. It has positive effect on physical capital, (housing amenities index) (0.35), financial capital (0.31), per capita household debt (0.33), social capital (community participation) (0.22). Similarly, it has positive effect on the living conditions in terms of per capita income (0.21), and per capita monthly household expenditure (0.22). In other words the household with greater cropped area have better livelihood in terms of housing amenities, financial capital, per capita household debt, community participation and living conditions in terms of per capita household expenditure. However, it has significant negative effect on the income diversity index.

The crop diversity index has significant negative effect on political participation (-0.14) and income diversity index (-0.23). It does not have significant effect on the livelihood assets or living conditions. The household with diversified crop usually shifting cultivators have lesser diversified income and lesser political participation. On

the other hand crop diversity index is not significantly related to housing amenities index, financial capital, per capita household saving, per capita household debt, community participation, per capita income, and per capita monthly household expenditure.

6.4.7 Input use and Tribal Development

The effect of input use on the tribal livelihood and living conditions has been analysed in terms of the frequency of use of local seeds, use of HY Seeds, use of organic manure, chemical fertilisers (NPK) and chemical fertilisers (Minor).

The results show that the frequency of use of local seeds has negative effect on the livelihood and living conditions. Livelihood assets such as physical capital, financial capital (saving) are negatively impacted by the frequency of the use of local seeds. Similarly, it has negative impact on the living conditions in terms of per capita income and expenditure. Input use in terms of use of local seed is significantly related to housing amenities index (-0.17), per capita household saving (0.13), per capita income (-0.12) and per capita monthly household expenditure (-0.19). Although household with greater use of local seed have lesser per capita income and housing amenities, the household expenditure decrease and this in turn resulted in increase in household saving. On the other hand financial capital, per capita household debt, community participation, political participation, and income diversity index are not significantly related with use of local seed even at 5 percent level.

Input use of HYV seed has significant positive effect on physical asset (housing amenities index) (0.15) and living conditions in terms of per capita monthly household expenditure (0.22). In other words, with the increased use of HYV seeds, the household's physical capital and living condition (household expenditure) also increase. On the other hand the financial capital, per capita household saving, per capita household debt,

community participation, political participation, per capita income, and income diversity index are not significant even at 5 percent level.

Interestingly, the use of organic manure also has significant positive effect on the tribal livelihood and living conditions. It has positive effect on the tribal livelihood assets such as physical capital (housing amenities index) (0.26), financial capital (0.28), and social capital (community participation) (0.15). It has similar effect on the living conditions viz., per capita household debt (0.22), per capita income (0.25), income diversity index (0.20), and per capita monthly household expenditure (0.15). In other words, household using greater organic manure has greater physical capital (housing amenities), financial capital, social capital, per capita income, diversified income. The households have more expenditure and debt when they use more input in terms of use of organic manure. On the other hand per capita household saving and political participation are not significantly related to use of organic manure even at 5 percent level.

Use of chemical fertilizer (NPK) has a significant positive effect on livelihood and living conditions. It has significant positive effect on financial capital (0.20), per capita household debt (0.18), while having no significant effect on social or physical capital. It has significant positive effect on both the indicators of living conditions viz., per capita income (0.17) and per capita monthly household expenditure (0.18).

Use of minor chemical fertilizers has significantly positive effect on livelihood and living conditions. It has significant positive effect on physical capital (housing amenities index) (0.13), financial capital (0.26), and per capita household debt (0.23). Similarly, it has significant positive effect on the indicators of living conditions viz., per capita income (0.14) and per capita monthly household expenditure (0.17). In other words, with the use of minor and major (NPK) chemical fertilizers the household

expenditure and household debt, household per capita income and household per capita income also increase.

In this chapter, an attempt has been made to discuss the results of analysis of quantitative data collected through pretested structured household interview schedule. This chapter was devoted to discuss tribal development in terms of emerging patterns of tribal livelihood and living conditions. The differential patterns of tribal livelihood and living conditions across the shifting and settled cultivators were discussed. Further, the effects of various dimensions of agrarian transformation from shifting cultivation to settled agriculture on tribal livelihood and living conditions were discussed. In the light of the results of this, the next chapter is devoted to discuss the agrarian challenges and new land use policy.

Table 6.1 Pattern of Physical Capital Endowment: Housing and Amenities

Sl. No	Indicator	Type of Cultivation				Total N=282		‘t’
		Shifting n = 75		Settled n =207		Frequency	Percent	
		Frequency	Percent	Frequency	Percent			
1	Own House	16	21.3	31	15.0	47	16.7	1.26
2	Housing Plot with LSC	18	24.0	79	38.2	97	34.4	2.22*
3	Ration Card	74	98.7	204	98.6	278	98.6	0.07
4	Electricity	66	88.0	205	99.0	271	96.1	4.35**
5	Phone	62	82.7	186	89.9	248	87.9	1.64
6	Toilet	37	49.3	114	55.1	151	53.5	0.85
7	Gas Connection	18	24.0	100	48.3	118	41.8	3.73**
8	Water Connection	19	25.3	81	39.1	100	35.5	2.15*
9	Two Wheeler	9	12.0	44	21.3	53	18.8	1.76
10	Four Wheeler	4	5.3	18	8.7	22	7.8	0.93
11	Three Wheeler	0	0.0	1	0.5	1	0.4	0.60
12	Housing Amenities Index	0.48	0.18	0.57	0.20	0.55	0.20	3.46**

Source: Computed

** P < 0.01 * P < 0.05

Table 6.2 Pattern of Financial Capital Endowment

Sl. No	Form	Type of Cultivation				Total N = 282		‘t’
		Shifting n = 75		Settled n = 207		Mean	S.D	
		Mean	S.D	Mean	S.D			
I	Household Saving							
1	Saving in Cash	4889 (22.0)	6990	10681 (26.3)	27073	9141 (25.6)	23595	1.83
2	Saving in Bank	15747 (70.8)	115803	27615 (67.9)	112063	24459 (68.4)	112984	0.78
3	Saving in Post Office	267 (1.2)	2309	937 (2.3)	7431	759 (2.1)	6479	0.77
4	Saving in Self Help Groups	1333 (6.0)	2547	1429 (3.5)	5366	1403 (3.9)	4777	0.15
5	Household Saving	22235 (100)	116720	40662 (100)	121525	35761 (100)	120337	1.14
6	Per capita Household Saving	3756	14776	9373	27621	7879	24959	1.68
II	Household Debt							
7	Household Debt	5653	11479	3844	9860	4325	10325	1.30
8	Per capita Household Debt	1107	1842	892	2942	949	2692	0.59
III	Financial Capital							
	Per capita Financial Capital	16582	108466	36818	121672	31436	118453	1.27
		2649	13928	8481	27461	6930	24710	1.76

Source: Computed

Figures in parentheses are percentages

** P < 0.01

* P < 0.05

Table 6.3 Pattern of Social Capital

Sl. No	Mode	Type of Cultivation				Total N=282		t
		Shifting n = 75		Settled n =207		Mean	S.D	
		Mean	S.D	Mean	S.D			
I	Community Participation							
	Church	2.3	0.8	2.4	0.7	2.4	0.7	1.32
	YMA	1.9	0.8	2.0	0.9	2.0	0.8	0.72
	Youth Wing of Church	1.5	1.2	1.9	1.1	1.8	1.1	2.26*
	MHIP	1.4	0.8	1.6	0.9	1.5	0.9	1.10
	Games & Sports Association	0.7	0.8	0.9	1.0	0.9	0.9	1.79
	Self Help Groups	0.8	1.1	0.8	1.1	0.8	1.1	0.20
	MUP	0.5	0.8	0.5	0.9	0.5	0.9	0.37
	Community Participation	1.3	0.5	1.4	0.5	1.4	0.5	1.96*
II	Political Participation							
	Voting in Village Council Election	2.5	0.7	2.6	0.6	2.6	0.6	1.08
	Voting in Assembly Election	2.5	0.7	2.5	0.6	2.5	0.6	0.79
	Voting in General Election	2.1	0.9	2.2	0.9	2.2	0.9	1.35
	Political Participation	2.4	0.7	2.5	0.6	2.4	0.6	1.25

Source: Computed

** P < 0.01 * P < 0.05

Table 6.4 Pattern of Annual Household Income

Sl. No	Source	Type of Cultivation				Total N=282		t
		Shifting n = 75		Settled n =207		Mean	S.D	
		Mean	S.D	Mean	S.D			
1	Crop Husbandry	33373 (64.2)	17456	52823 (63.4)	53980	47650 (63.6)	47859	3.06**
2	Labour	12267 (23.6)	8853	13530 (16.2)	14427	13194 (17.6)	13174	0.71
3	Business	1547 (3.0)	6683	6854 (8.2)	24169	5443 (7.3)	21107	1.87
4	Animal Husbandry	2673 (5.1)	6302	5709 (6.9)	22647	4902 (6.5)	19704	1.14
5	Government Service	2100 (4.0)	11365	4193 (5.0)	20842	3637 (4.9)	18797	0.83
6	Other Sources	0 (0.0)	0	180 (0.2)	1487	132 (0.2)	1276	1.05
7	Annual Household Income	51960 (100)	24823	83290 (100)	91549	74957 (100)	80615	2.92**
	Per capita Income	11997	6579	20997	22466	18603	19932	3.41**
	Income Diversity Index	0.42	0.14	0.44	0.12	0.44	0.12	1.43

Source: Computed Figures in parentheses are percentages

** P < 0.01 * P < 0.05

Table 6.5 Table Pattern of Monthly Household Expenditure

Sl. No	Item	Type of Cultivation				Total N=282		't'
		Shifting n = 75		Settled n =207		Mean	S.D	
		Mean	S.D	Mean	S.D			
1	Food	1637 (32.6)	819	2170 (32.2)	1212	2028 (32.3)	1144	3.5**
2	Church and NGOs Donations	1100 (21.9)	767	1834 (27.2)	3725	1638 (26.1)	3230	1.7
3	Transport	794 (15.8)	683	962 (14.3)	1822	917 (14.6)	1601	0.8
4	Medication	608 (12.1)	758	671 (10.0)	775	655 (10.4)	770	0.6
5	Clothing	442 (8.8)	537	528 (7.8)	1480	505 (8.0)	1298	0.5
6	Phone	193 (3.8)	188	278 (4.1)	348	255 (4.1)	315	2.0*
7	Electricity	178 (3.5)	161	209 (3.1)	193	201 (3.2)	185	1.2
8	Water	70 (1.4)	90	94 (1.4)	101	87 (1.4)	99	1.7
9	Monthly Household Expenditure	5022 (100)	2335	6745 (100)	5966	6287 (100)	5302	2.4*
10	Per capita Monthly Household Expenditure	1175	588	1644	1182	1519	1076	3.3*

Source: Computed

Figures in parentheses are percentages

** P < 0.01

* P < 0.05

Table 6.6 Relationship among the Indicators of Tribal Development: Zero Order Correlation

Variable	Indicator	Livelihood						Living Conditions		
		Va01	Va02	Va03	Va04	Va05	Va06	Va07	Va08	Va09
Va01	Housing Amenities Index	1	0.34**	0.33**	0.02	0.40**	-0.07	0.30**	-0.14*	0.33**
Va02	Financial Capital	0.34**	1	0.94**	0.05	0.16**	0.04	0.48**	-0.08	0.45**
Va03	Per capita Household Saving	0.33**	0.94**	1	0.15**	0.13*	0.09	0.61**	-0.06	0.50**
Va04	Per capita Household Debt	0.02	0.05	0.15**	1	-0.13*	0.03	0.11	0.03	0.06
Va05	Community Participation	0.40	0.16	0.13	-0.13	1	-0.02	0.05	-0.12*	0.04
Va06	Political Participation	-0.07	0.04	0.09	0.03	-0.02	1	0.18**	0.07	0.12*
Va07	Per capita Income	0.30**	0.48**	0.61**	0.11	0.05	0.18*	1	-0.13**	0.61**
Va08	Income Diversity Index	0.14**	0.08	0.06	0.03	0.12*	0.07	0.13*	1	0.02
Va09	Per capita Monthly Household Expenditure	0.33**	0.45**	0.50**	0.06	0.04	0.12**	0.61**	-0.02	1

Source: Computed

**** P < 0.01**

*** P < 0.05**

Table 6.7 Agrarian Transformation and Tribal Development: Correlation Matrix

Agrarian Transformation	Tribal Livelihood					Living Conditions			
	Var01	Var02	Var03	Var04	Var05	Var06	Var07	Var08	Var09
Distance to HQ	-0.12*	-0.13*	0.08	-0.10	0.03	-0.07	-0.27*	0.06	-0.18*
Type of Cultivation	0.20*	0.10	-0.04	0.08	0.12*	0.07	0.20**	0.08	0.19
Number of Plots	0.27**	0.26**	0.09	0.25**	0.16*	0.08	0.09	-0.10	0.17*
Area of Land Possessed									
with LSC	0.45**	0.37**	0.00	0.36**	0.28**	0.06	0.31**	0.02	0.27**
on Common Land	-0.20**	-0.03	0.06	0.03	-0.05	0.01	-0.18**	-0.07	-0.16*
Area of Land Possessed	0.44**	0.36**	0.10	0.36**	0.32**	0.09	0.27**	0.00	0.32**
Size of Land Holding	0.48**	0.33**	0.16*	0.33**	0.32**	0.04	0.27**	0.03	0.28**
Duration of Land Possessed									
with LSC	0.45**	0.23**	-0.05	0.24**	0.23**	0.01	0.23**	0.05	0.21**
with PLP	0.00*	-0.01	0.18**	-0.03	0.02	0.11	0.01	0.00	0.03
on Common Land	-0.19**	-0.07	-0.01	-0.06	-0.09	-0.05	-0.17**	-0.15*	-0.08
Livestock Value	0.10	0.10	0.00	0.13	0.09	-0.06	-0.01	0.10	0.13*
Cropping									
Gross Cropped Area	0.35**	0.31**	0.07	0.33**	0.22**	0.00	0.21**	-0.12*	0.22**
Crop Diversity Index	0.01	0.06	0.06	0.05	-0.05	-0.14*	-0.09	-0.23**	-0.01
Input Use									
Local Seeds	-0.17**	-0.06	0.13*	-0.06	-0.08	0.04	-0.12*	0.03	-0.19**
High Yielding Seeds	0.15*	0.04	-0.11	0.04	0.08	-0.04	0.11	-0.06	0.22**
Organic Manure(Specify)	0.26**	0.28**	0.07	0.22**	0.15*	0.04	0.25**	0.20**	0.15*
Chemical Fertilizers(NPK)	0.08	0.20**	0.08	0.18**	0.09	-0.09	0.17**	0.06	0.18**
Chemical Fertilizers(Minor)	0.13*	0.26**	0.06	0.23**	0.10	-0.07	0.14*	0.05	0.17**

Source: Computed

** P 0.01

* <0.05

CHAPTER VII

AGRARIAN CHALLENGES AND NEW LAND USE POLICY

This chapter is highlighted into two major sections viz., Challenges faced in agriculture and New Land Used Policy. The chapter will try to explain the nature of problem faced by the farmers in Mizoram and how the New Land Use Policy implemented by the government helps the farmer to cope with the existing problems.

7.1 Challenges Faced by Farmers

Farmers as a socio economic category faced with a number of social economic political challenges in globalisation context today. The plight of the tribal jhum cultivators with their simple technology is is not exception to this. One of the objectives of the present study is to find out the difficulties and problems in shifting cultivation as perceived by the farmers. In the context of switching over from Jhum to settled agriculture, the farmers may have a number of constraints, problems or obstacles (see Datta 1992; Ramakrishnan 1992; Ninan 1992; Dasgupta and Banerjee 1984; Hungyo 1982). The present section seeks to explore the problems of them.

The farmers were asked to list out the challenges faced by them with an open ended question during the pre testing. The farmers' responses were coded and then during the final survey the respondents were requested to rate these problems on a four point scales (Always (3), Mostly (2), Sometimes (1) and Never (0) (see Table 7.1).

The problems faced by farmers are Lack of agro based industries, Lack of storage facilities, Inadequate availability of organic manure, Inadequate supply of chemical fertilizer, Inadequate supply of chemical pesticide, Inadequate electricity supply, Inadequate funds, Poor roads, Lack of transport services, Non remunerative price, Inadequate animal labour, Lack of marketing facilities, Lack of Irrigation facilities or

sources, Non suitability of land for cultivation, Lack of Information on Market, Lack of technical knowhow to practice and Inadequate human labour.

On the whole, lack of agro based industries, lack of storage facilities, and inadequate availability of organic manure are problems that are always faced by the farmers in Mizoram. Even the settled agriculturalist also rated these three challenges as a problem which they always faced. In the mean time the shifting cultivation with more challenges held that lack of agro based industries, lack of storage facilities, inadequate availability of organic manure, inadequate supply of chemical fertilizer, and inadequate supply of chemical pesticide as challenges they always face. Most of the challenges which are always faced by the farmers are mainly connected to settled agriculture and commercialisation and shifting cultivators also felt the need for industries and fertilizers for development of agriculture.

On the whole, both the farmers rated inadequate supply of chemical fertilizer, inadequate supply of chemical pesticide, inadequate electricity supply, inadequate funds, poor roads, lack of transport services, non remunerative price, inadequate animal labour, lack of marketing facilities, and lack of irrigation facilities or sources as a challenges which they mostly faced. The pattern is same with the settled agriculturalist where the problems cited above are mostly faced as a result of commercialisation and capitalism in agriculture. In the mean time, the shifting cultivators rated inadequate electricity supply, inadequate funds, poor roads, lack of transport services, non remunerative price, inadequate animal labour, and lack of marketing facilities are rated as challenges which was faced most of the time. The shifting cultivators with their simple tools are more affected by these problems in the process of transformation.

Non suitability of land for cultivation, lack of information on market, lack of technical knowhow to practice and inadequate human labour are rated as challenges

which are sometimes faced by both the cultivators. Non availability of land is not a challenge to the cultivators because of the availability of land under common land and land allotment under present NLUP. The NLUP have positive impact on some areas where trainings are provided through the government department which helps the farmers to develop in technical knowhow and information on market and human labour also increases as work for agricultural labourer have increase tremendously giving employment to the labourer and labourer for the farmers.

The problems rated by settled agriculturalist (1.7) on inadequate animal labour is significantly higher than the shifting cultivators (1.2) towards acceptance as the tendency to utilize animal labour arises with the settled agriculture.

The shifting cultivators (1.7) perceived the lack of market facilities as mostly faced problem while the settled agriculturalists (1.4) faced this problem sometimes. The reason is not far to seek. The shifting cultivators are cultivating most of the crops for domestic consumption and only for surplus market are expected. On the other hand, the settled cultivators produce their products primarily for market. Hence, inadequate or lack of markets seem to be hurting the settled cultivators as compared to the shifting cultivators.

Although land is always available from common land for *Jhum* cultivation, the shifting cultivators (1.8) accept non suitability of land for cultivation which is significantly higher than settled agriculturalist (1.1). This is mainly due the agrarian transformation influencing the shifting cultivators who are ready to switchover towards settled agriculture if land is available. Insecurity in renting land, financing constraints, and the absence of insurance make the farmer to pursue diversified income strategies (Kevane, 1996). If the problem on land and irrigation are solved, the role of agriculture in

providing food security to the vast numbers of food insecure people will be easier to achieve (Vyas 2002).

Lack of adequate infrastructure and economic incentives has contributed to the agrarian stagnation (Kishore, 2004). The farmers always face problems such as Lack of agro based industries (2.7) in Mizoram and they do not have the place for processing their products for market. Surprisingly, the shifting cultivators (2.8) rate the lack of agro based industries higher than the settled agriculturalist (2.7) as a problem.

Lack of storage facilities (2.7) which is almost absent is also rated as a problem by both types of farmers as they lose many of their products especially fruits and vegetables because of the lack of storage facilities. Certain small scale industries, animal based farming system and agricultural are some other alternative should be practiced in order to improve social economic status of farming community where some of the suggestion are made on Tea Plantation, Horticultural Crops, Dairy Farming, Poultry and Duck farming, Cultivation of Medical and Aromatic Plants (Das, 2013)

Inadequate availability of subsidised organic manure (2.5), chemical fertilizer (2.4) and chemical pesticide (2.4) also has effects on the number of product. The land especially settled cultivators land needs more preparation and protection from insects. The unavailability at cheaper rate and unavailability of continuous supply discourage the farmers to depend on them. So, even sedentary form of farming is practiced without subsidised organic manure, chemical fertilizer and chemical pesticide which might be because of the availability of capital among the settled agriculturalist. A very disturbing finding is that the shifting cultivators (2.5) rated use of inadequate supply of chemical fertilizers and pesticides higher than the settled agriculturalist (2.4) as a problem which might be because the fallowing period of jhum land in Mizoram is shortened among the shifting cultivators and the land needs more input in terms of fertilizers.

Mostly the farmers rated inadequate electric supply (2.2) as a problem and most of the cultivated lands are not connected with electricity. The amount of electric consumption in agriculture in 2013-2014 is 0.059 kw/h which contributes only 0.01% of the total units of electricity consumed in Mizoram (Mizoram, 2014). This in turn makes the irrigation system not possible as most lands are in the mountains and irrigation from river without power is not possible. Moreover the use of certain machinery to upgrade farming technique is also not possible without power. Rural electrification is one of the main initiatives of the government which can provide development towards agriculture. It can bring down the cost of irrigation and improve the working capital situation of farmers. It can also trigger growth in storage and processing infrastructure which will permit value addition and the much needed crop diversification in the state (Kishore, 2004).

Inadequate funds and capital (2.2) is rated as a problem which crippled the farmers in increasing products. Moreover the funds received through New Land Used Policy and other programmes for farmers are not sufficient and the supply of material assistance and seedlings are also not regular and the quality is not good which create lots of problem for the farmers in Mizoram.

Poor roads (1.8) and Lack of transport services (1.6) are rated as a problem by the farmers as it affected the market. Low transport facility can distort the allocation of resources across geographically dispersed production units and would reduce their income. So, one way to raise agricultural and aggregate productivity in rural and tribal areas would be to encourage the improvement of transportation networks (Adamopoulos, 2011). Government allocations to the agricultural sector for the years under review have not benefited the sector significantly. Transparency and accountability should be encouraged to ensure judicious use of funds appropriated to agriculture. Mechanisms

should be put in place to ensure increased release and disbursement of budgetary allocations to agriculture, as well as other sectors to promote sustainable development. There is also an increased need for adequate monitoring, evaluation, and control of budget implementation, because a misappropriation of funds tends to nullify the magnitude of governments' contributions to the sector (Ani et.al. 2014).

Moreover the value of products decreases because of the high cost of transport. The improvement in infrastructural facilities like road network, increased commercialization and development of trade, crop pattern got adjusted because of advantages of trade in commodities which is almost absent in Mizoram that was observed during fieldwork of the present study. The state can overcome supply constraints by investing in agricultural infrastructure although this may create inflationary pressures by increasing the rate of growth of the industrial sector which also relaxes them by removing supply constraints in agriculture. Improved income distribution also raises the rate of growth in agriculture (Dutt, 1991).

Moreover, the farmers have less access to technology and training because of lack of transport facilities. Jha (1976) emphasised the need for education and proper guidance of the jhumias to adopt the modern methods of permanent culture and scientific cultivation. Technological change for agriculture is the major source of economic growth (Spolador and Roe, 2013). Agricultural modernization has been always the national development goal and primarily involves specialization, mechanization, scaling up and technocracy (Jingzhong, 2015).

Non remunerative price can be the effect of multiple problems such as lack of marketing facilities, lack of transport facilities and low quality of products. The prices of products especially fruits and vegetables are not stable and there is no proper rate that is fixed. The farmers are bargained by local buyers and contract farmers from outside where

they are forced to sell their product by force as the farmer do not have other choice. The high prices on the international markets in did not benefit local farmers and even increased food insecurity, as they were unable to immediately respond to the new opportunity (Temudo and Abrantes, 2013). Being exposed to international competition does not necessarily make producers more efficient users of resources. Globalized agriculture has put all sorts of stringent quality specifications on internationally traded crops and most small producers have not been able to meet them due to their insufficient land ownership, finances and knowledge (Aydin, 2010). Poor infrastructure and under-developed primary agricultural marketing network further worsen the problem of farmers by increasing the cost of marketing and price fluctuations (Kishore, 2004).

Access to markets both for selling products and buying goods has helped improve livelihood and food security in many indigenous communities. Better access to the market for selling goods and the labour market has increased opportunities for cash income The farmers surprisingly state problems in marketing facilities (1.5). This is mainly because the products are still just enough to sell in local market although it is cheaper. Moreover the commissioner buys the products in their fields which saved lots of trouble for the farmers. The present agricultural marketing system is abysmal and the farmers are not getting the appropriate price for their crops. This situation demands urgent attention of the government, policy makers and planners to save the farmers and to re-boost the agricultural economy of the tribal. The forces of globalization have overtaken the traditional and commercialization has in turn faced the burden by turning the occupation in to high cost based cultivation. This clearly implies that, if the farmers continue to respond to the demands of the market forces in this manner only then they may get indebted in future (Sajjad and Chauhan 2012; Hungyo, 1982).

Lack of irrigation facilities (1.5) is rated as a problem which is faced for sometimes because of the dependency on rain and also irrigation facilities is almost absent. Mizoram is a terrain where irrigation is suitable only through the use of power and rain water harvesting. Cheaper access to irrigation also encouraged farmers to bring larger areas under summer crops where higher yields can be obtained under more controlled conditions (Kishore, 2004). Access to soil and water of good quality in sufficient quantity are vital for successful small scale farming. Informal fresh produce markets are efficiently supplied by small scale irrigation farmers which develop the living condition of the tribals. Widespread horticulture production in the São Francisco valley was made possible only by large scale state investments in irrigation, and later in facilitating a shift by producers away from basic food crops towards higher value fruit crops (Selwyn, 2010). Due to the absence of irrigation facilities it was hardly possible to have a second crop in the district of West Bengal but the Mayurakshi River irrigation system has changed all this and made possible additional crops on a considerable part of the land reducing the frequency of crop failures due to drought (Newaj, 1975).

Non suitability of land for cultivation (1.2) is rated as a problem which is sometimes faced. Many farmers do not see it as a problem as the implementation of NLUP helps the farmer to acquire land through the revenue department which is easier than before.

Lack of Information on Market (1.2) and Lack of technical knowhow (1.1) is not a very big problem for the farmers as most of them have experience on farming and marketing is still somehow sufficient within the local market for certain crops especially fruits and vegetables. More shifting cultivators rated the lack of information on market and lack of technical knowhow higher than the settled agriculturalist. This indicated that

the settled agriculturalist received better training on agriculture and awareness on marketing.

Inadequate human labour (0.9) is not faced by both the farmers as labourers are available any time of the year. The key informant interviews and survey also indicate that landless labour class has started to exist in Mizoram. Inadequate animal labour is not rated as a problem by farmers because the use of animal is absent.

7.2 New Land Used Policy

Jhum or shifting cultivation is always perceived as a threat to ecology and environment. The Jhum system has been held responsible for tribal poverty due to its low productivity in the academic and policy circles. In response to the environmental degradation the Government of Mizoram introduced a policy called the New Land Use Policy (NLUP) in the year 1984-85 to stop Jhum cultivation. This was the flagship programme of the Indian National Congress party's government led by Sri. LalThanhawla. The main aim of the policy is to put an end to the practices of shifting cultivation by giving the farmers alternative sustainable land-based occupations. NLUP operates through Agriculture, Horticulture, Industries, Forests, Fisheries, Sericulture, and Soil and Water Conservation Departments of the Government of Mizoram. The policy covers 120,000 families and the Indian Central Government recently set aside Rs 2,416 Crores for the project.

The intervention of the sample farmers of the present study in the implementation of New Land Use Policy and the contribution of the New Land Use Policy towards the challenges of agriculture in Mizoram could be highlighted into five sections viz., Beneficiaries, Trade selected and Year of receiving, Nature of assistance, Ways of

utilization, Reason of not receiving and expectation and Impact of NLUP on sample beneficiaries.

7.2.1 Beneficiaries, Trade selected and Year of receiving

New Land Used Policy of the Mizoram Government is a policy related with agriculture development to wean away shifting cultivation. A question was asked whether the respondent household benefitted under NLUP. On the whole, a predominant majority of the respondents have benefitted under this scheme. Over three fourth of the respondent households (84%) have benefitted under the NLUP implemented by the state government. There was not much difference in the proportion of beneficiaries across the two types of cultivator viz., shifting and settled cultivators. Among the settled agriculturists, 84 percent of the respondents benefitted while among the shifting cultivators 83 percent of the households benefitted under the NLUP.

The trades selected by the shifting cultivators are mostly agricultural which shows that there is transition taking place from shifting cultivation to settled agriculture. Although the trade selected by the shifting cultivators are under agriculture many household do not materialize as expected under NLUP norms (see Table 7.2).

The trades selected by the sample households under NLUP of Mizoram Government are Orange (23.8%), Rubber (14.9%), Broom (8.5%), Pineapple (8.2%), Oil Palm (5.3%), Sericulture (4.6%), Coffee (3.2%), Wet Rice Cultivation (2.8%), Areca nut (2.8%) and Tea (1.4%). 8.2% households select non agriculture trade such as automobiles, carpentry, petty shop and tailoring. 16% of the sample households do not receive assistance under NLUP.

The beneficiaries in Orange trade are more among the shifting cultivator (26.7%) than the settled agriculturalist (22.7%). Rubber trade is more common among the settled agriculturalist (15%) than the shifting cultivators (14.7). Broom trade is more selected by

the settled agriculturalist (8.7%) as compared to the shifting cultivators (8%). Pineapple is significantly higher among the settled agriculturalist (10.1%) than the shifting cultivators (2.7%). Surprisingly Oil palm trade selected is almost the same between the settled agriculturalist (5.8%) and shifting cultivators (4%). Coffee trade is higher among the shifting cultivators (5.3%) than the settled agriculturalist (2.4%). Arecanut is also higher among the shifting cultivators (4%) than the settled agriculturalist (2.4%). Tea is also higher among the shifting cultivators (2.7%) than the settled agriculturalist (1%). Most of the trade with commercial crops are more among the shifting cultivators which shows that the agrarian transformation with the assistance of NLUP pulled the farmers towards commercialisation of agriculture.

The year of receiving assistance from NLUP range from the year 2008 to 2014. Majority of the sample households (52.5%) receive the assistance in the year 2013. Assistance is distributed on instalment basis which are distributed in three instalments. These instalments are distributed in consecutive years which confuse the year of receiving but clearly shows that assistance are distributed on instalment which is not enough for farmers.

7.2.2 Nature of assistance

The nature of assistance under NLUP among sample household of the present study is classified as financial assistance, subsidised equipments and subsidised seeds (see Table 7.6).

The average financial assistance for a particular household is Rs 44,651 which constitutes 99.1% of the proportion of assistance under NLUP. Financial assistance is distributed on instalment. The amount of financial assistance under NLUP depends on the trade selected; therefore it is slightly more among the settled agriculturalist (Rs 45,013) as

compared to the shifting cultivators (Rs 43,653) as the settled agriculturalist selects trade beyond agriculture.

Subsidised equipment and tools is absent among the shifting cultivators and very few is observed among the settled agriculturalist (0.7%). The mean subsidised seed received by the beneficiaries is 175 seeds which is more among the settled agriculturalist (190) as compared to the shifting cultivators (132). The mean financial assistance, subsidised equipment/tools and subsidised seeds is higher among the settled agriculturalist as compared to the shifting cultivators.

7.2.3 Ways of utilization of assistance

The utilisation of assistance under NLUP by the beneficiaries in the present study is categorised into Plantation, Preparation, Buying tools and others (see Table 7.5).

Majority of the beneficiaries of the sample household use the assistance for plantation (56%). The rest (12.4%) use the assistance for preparation of land and farming fields. Although equipments are provided in certain trade, 1.4% of the sample household beneficiaries utilized the financial assistance from NLUP for buying tools.

Use of assistance for plantation is more among the settled agriculturalist (59.4%) as compared to shifting cultivators (46.7%). Land preparation is also higher among the settled agriculturalist (13.5%) than the shifting cultivators (9.3%). In the mean time using assistance for buying tools is more among the shifting cultivators (2.7%) than the settled agriculturalist (1%). This is mainly as the settled cultivators are more advanced in sedentary agriculture and land preparation is not needed to a large extends. The assistance received was also used more on plantation other than land preparation and for buying tools.

Utilizing assistance for other purposes include the use of assistance beyond the NLUP trade which is used for other household needs and some are beyond farming

activity. Many households use the financial assistance for buying television, refrigerator and two wheelers which is against the rules and regulations of NLUP. The awareness regarding the effective utilisation of assistance is minimal and the ethical values of the mizo are questioned as most of them used it for other purposes.

7.2.4 Reason of not receiving and expectation

The reasons for not receiving assistance under NLUP among the sample household as a whole in the present study are categorised as favouritism based on political party, no proper selection criteria, not accepted by self and no comment (see Table 7.4).

Among the sample households, majority (84%) gave no comment as most of the sample households are beneficiaries. Only 16% of the sample household are non-beneficiaries where favouritism based on Political Party (8.2%) contributed the highest followed by no proper selection criteria (5.3%) and not accepted by self (2.5%).

Party favouritism is more among the settled agriculturalist (8.7%) than among the shifting cultivators (6.7%). The shifting cultivators (9.3%) felt that the NLUP lack selection criteria more than the settled agriculturalist (3.9%). Similar observations was made by Lalenzama (2011) where many NLUP beneficiaries who failed are mainly party workers who are selected based on political affiliation as there was no proper criteria in selection process.

One very notable reason for not receiving assistance is that the assistance is not accepted by them/self (2.5%) although they are selected to receive assistance. More settled agriculturalist (2.9%) do not accept the assistance from NLUP than the shifting cultivators (1.3%). The assistance is rejected mainly because of the ethical values and religious values wanting to be truthful. This clearly shows that there are no proper criteria for selection or the persons involved are not careful enough in the process of selection.

The farmer's expectations on receiving NLUP in the future were also studied (see Table 7.4). The major response was no comment (85.8%) as most of the sample households receive assistance. 10.6% household do not have expectations which is mainly because they believed that there is no proper criteria for selection of beneficiaries under NLUP which is similar for the settled cultivators (10.7%) and the shifting cultivators (10.6%). Shifting cultivators households (6.7%) expect to receive the NLUP assistance in the future which is more than the settled agriculturalist (2.4%).

7.2.5 Impact of NLUP on sample beneficiaries

The successful implementation of the schemes depends on earnest zeal, un-exhausted patience and with follow up programmes (Bordoloi 1976). To assess the impact of NLUP on household economy of the respondents, they were asked to rate thirteen items viz., conferred land rights on men, conferred land rights on women, settled your family in permanent land, increased your household wealth, increased your household income, increased your employment opportunities, it persuaded you to work harder for more hours, increases your household expenditure, increases your households saving, increases agricultural production, increased the market opportunities, increased knowledge on modern agricultural practices, and increased skills in modern agricultural practices with four point scale such as strongly agree (4) agree (3), disagree (2) and strongly disagree (1) (see Table 7.7).

Unfortunately, majority of the respondents across the type of cultivation disagree with all these improvements expected at the outset of implementation of the NLUP. Both the farmers disagreed that NLUP conferred land rights (2.0) on men as most land are allotted under periodic land pass and strongly disagreed that the NLUP confer land rights to women (1.2) this is mainly because the mizo society follow a patriarchal form of family and most of the lands received by the household under NLUP are in the name of

the male member of family and only widow received land in their names. Although the shifting cultivators disagreed to NLUP conferring land rights to men and women, their perception is more positive than the settled agriculturalist.

The farmers as a whole disagreed that the NLUP will settle their family in permanent land (1.8) but the shifting cultivators (2.0) are more positive than the settled agriculturalist (1.8). The land ownership under the NLUP is under periodic land pass and land pass is not given permanently and they will automatically lose their land if not used for cultivation. For the shifting cultivators the cultivation on permanent land other than common land allotted for one year is regarded as permanent.

The farmers do not agree that the NLUP increase employment opportunities (2.2), increase household income (2.1) and increase the wealth of the household (1.9). The trade mainly selected are under agriculture and do not contribute to the family income immediately. Although some beneficiaries use the trade for starting family occupation it is observed that many use it for other household needs beyond the trade selected which makes the farmer disagree that NLUP will increase employment opportunities. The shifting cultivators although they do not agree have more positive mindset toward the impact of NLUP in increase of employment opportunities (2.4), increase of household income (2.2) and increasing the wealth of the household (2.0) as compared to the perception of the settled agriculturalist on impact of NLUP in increase of employment opportunities (2.2), increase of household income (2.1) and increasing the wealth of the household (1.8).

The farmers disagree that the NLUP will increase household expenditure (2.3) and persuade the farmers to work harder (2.2). Most of the beneficiaries utilized the assistance incorrectly which clearly bring out the mindset of the farmers incline not towards

development but easy money making which is against hard work. When the income is not much the expenditure is also not more among the farmers.

The farmers disagreed that NLUP increase agricultural production (1.9) as farming needs more than a year to produce so the cultivation still do not yield production. Even in terms of marketing opportunity (1.7) also both the farmers disagreed and it is not available although marketing facilities are a part of NLUP programme.

Savings have not increased after the implementation of NLUP as most of the beneficiaries have only started their livelihood practice and it is still early to evaluate how it affects household income. So, the farmers disagreed that saving will increase (1.9) after the implementation of NLUP.

The beneficiaries disagreed that the NLUP increased the knowledge and skills (2.1) of the farmers on modern agriculture. Most of the trades were not supported with enough training and the place of training was mainly in district capitals and block headquarters which is not accessible for the farmers from the remote areas. Trainings are also not benefited by the farmers as the quality of some of the training are not helpful the farmers.

It is very distressing to point out these perceptions towards NLUP which are all negative from the beneficiaries themselves. As it is the flagship programme of the congress government, it is highly politicised in many areas. There is a dramatic transformation in the institutional infrastructure of agriculture through NLUP, but there is observation of fewer changes in its content (Hebink et. al. 2011). The limitations of the farming policies from the government is the selection of trade done by the farmers without expertise and interest which diversify their activities, shifting from food to cash crops and from one cash crop to another all according to changing policies which causes destruction of farming activities in many areas (Temudo and Abrantes, 2013. The failures of policy in

some areas were due to the fact that the agrarian barrier could not be overcome by new technologies which were operated without traditional input and mostly irrigation (Roy, 2007). Besides some beneficiaries are observed among the sample households but were already settled farmers who have done quite well even before receiving assistance.

In this chapter, an attempt has been made to discuss the challenges faced by the shifting and settled cultivators with the help of the primary data analysis. In the next chapter, the social dynamics of agrarian transformation and tribal development is described in terms of case studies.

Table 7.1 Problems Faced by Farmers

Sl. No	Problem	Type of Cultivation				Total N = 282		't'
		Shifting n = 75		Settled n = 207		Mean	S.D	
		Mean	S.D	Mean	S.D			
1	Lack of Agro Based Industries	2.8	0.9	2.7	0.9	2.7	0.9	0.65
2	Lack of Storage Facilities	2.8	0.9	2.7	0.9	2.7	0.9	0.86
3	Inadequate Availability of Organic Manure	2.5	1.1	2.5	1.0	2.5	1.0	0.28
4	Inadequate Supply of Chemical Fertilizers	2.5	1.1	2.4	1.1	2.4	1.1	0.93
5	Inadequate Supply of Chemical Pesticides	2.5	1.1	2.4	1.1	2.4	1.1	0.97
6	Inadequate Electricity Supply	2.2	1.2	2.2	1.0	2.2	1.1	0.42
7	Inadequate Funds	2.2	0.8	2.2	0.8	2.2	0.8	0.59
8	Poor Roads	1.8	1.0	1.9	0.9	1.8	1.0	0.42
9	Lack of Transport Services	1.7	1.0	1.6	1.0	1.6	1.0	0.77
10	Non Remunerative Price	1.6	1.0	1.6	1.0	1.6	1.0	0.16
11	Inadequate Animal Labour	1.2	1.4	1.7	1.5	1.6	1.5	2.80**
12	Lack of Marketing Facilities	1.7	1.0	1.4	1.1	1.5	1.1	1.99*
13	Lack of Irrigation Facilities or Sources	1.3	1.3	1.6	1.3	1.5	1.3	1.44
14	Non Suitability of Land for Cultivation	1.8	1.3	1.1	1.3	1.2	1.4	3.98**
15	Lack of Information on Market	1.6	1.0	1.1	1.0	1.2	1.0	3.69**
16	Lack of Technical Knowhow to Practice	1.5	0.9	0.9	1.0	1.1	1.0	4.16**
17	Inadequate Human Labour	1.2	1.0	0.9	0.9	0.9	0.9	2.52**

Source: Computed

** P < 0.01

* P <

0.05

Table 7.2 New Land Use Policy: No of Beneficiaries and Name of Trade

Sl. No		Type of Cultivation		Total N=282
		Shifting n = 75	Settled n =207	
I	NLUP Beneficiary			
	No	13 (17.3)	32 (15.5)	45 (16.0)
	Yes	62 (82.7)	175 (84.5)	237 (84.0)
II	Trade Selected under NLUP			
	Orange	20 (26.7)	47 (22.7)	67 (23.8)
	Rubber	11 (14.7)	31 (15.0)	42 (14.9)
	Broom	6 (8.0)	18 (8.7)	24 (8.5)
	Pineapple	2 (2.7)	21 (10.1)	23 (8.2)
	Oil Palm	3 (4.0)	12 (5.8)	15 (5.3)
	Sericulture	3 (4.0)	10 (4.8)	13 (4.6)
	Coffee	4 (5.3)	5 (2.4)	9 (3.2)
	Wet Rice Cultivation	2 (2.7)	7 (3.4)	9 (3.2)
	Arecanut	3 (4.0)	5 (2.4)	8 (2.8)
	Tea	2 (2.7)	2 (1.0)	4 (1.4)
	Non-Agriculture	6 (8.0)	17 (8.2)	23 (8.2)
	Not Benefitted	13 (17.3)	32 (15.5)	45 (16.0)

Source: Computed

Figures in parentheses are percentages

Table 7.4 Reason of not Receiving NLUP and Expectation

Sl. No		Type of Cultivation		Total N=282
		Shifting n = 75	Settled n =207	
I	Reason of Not Receiving NLUP			
	No Comment	62 (82.7)	175 (84.5)	237 (84.0)
	Party Favoritism	5 (6.7)	18 (8.7)	23 (8.2)
	No proper selection criteria	7 (9.3)	8 (3.9)	15 (5.3)
	Not Accepted by self	1 (1.3)	6 (2.9)	7 (2.5)
II	Expectation on Receiving NLUP in the future			
	No Comment	62 (82.7)	180 (87.0)	242 (85.8)
	No	8 (10.7)	22 (10.6)	30 (10.6)
	Yes	5 (6.7)	5 (2.4)	10 (3.5)

Source: Computed

Figures in parentheses are percentages

Table 7.3 NLUP: Year of receiving NLUP Financial Assistance

Sl. No	Year	Type of Cultivation		Total N=282
		Shifting n = 75	Settled n =207	
1	Not Received	13 (17.3)	32 (15.5)	45 (16.0)
2	2008	1 (1.3)	1 (0.5)	2 (0.7)
3	2009	0 (0.0)	3 (1.4)	3 (1.1)
4	2010	1 (1.3)	2 (1.0)	3 (1.1)
5	2011	7 (9.3)	20 (9.7)	27 (9.6)
6	2012	8 (10.7)	43 (20.8)	51 (18.1)
7	2013	44 (58.7)	104 (50.2)	148 (52.5)
8	2014	1 (1.3)	2 (1.0)	3 (1.1)

Source: Computed

Figures in parentheses are percentages

Table 7.5 NLUP: Ways of utilisation of Financial Assistance

Sl. No	Ways of Utilisation	Type of Cultivation		Total N=282
		Shifting n = 75	Settled n =207	
1	Not Received	13 (17.3)	33 (15.9)	46 (16.3)
2	Plantation	35 (46.7)	123 (59.4)	158 (56.0)
3	Preparation	7 (9.3)	28 (13.5)	35 (12.4)
4	Buying Tools	2 (2.7)	2 (1.0)	4 (1.4)
5	Others	18 (24.0)	21 (10.1)	39 (13.8)

Source: Computed

Figures in parentheses are percentages

Table 7.6 NLUP: Value of Assistance

(Value in Rupees)

Sl. No	Assistance Provided	Type of Cultivation				Total N=282	
		Shifting n = 75		Settled n =207		Mean	S.D
		Mean	S.D	Mean	S.D		
1	Financial Assistance	43653 (99.7)	35474	45013 (98.8)	34681	44651 (99.1)	34835
2	Subsidised Equipment/ Tools	0 (0.0)	0	341 (0.7)	2521	250 (0.6)	2164
3	Subsidised Seeds	132 (0.3)	204	190 (0.4)	267	175 (0.4)	252
4	Total	43786 (100)	11893	45544 (100)	12489	45076 (100)	12417

Source: Computed

Figures in parentheses are percentages

Table 7.7 NLUP: Impact on Household

Sl. No	Indicator	Type of Cultivation				Total N=282		't'
		Shifting n = 75		Settled n =207		Mean	S.D	
		Mean	S.D	Mean	S.D			
1	Conferred Land Rights On Men	2.2	1.3	1.9	1.4	2.0	1.4	1.8
2	Conferred Land Rights On Women	1.4	1.6	1.2	1.5	1.2	1.5	1.1
3	Settled Your Family In Permanent Land	2.0	1.3	1.8	1.2	1.8	1.2	1.0
4	Increased Your Household Wealth	2.0	1.3	1.8	1.2	1.9	1.2	1.0
5	Increased Your Household Income	2.2	1.2	2.1	1.1	2.1	1.1	0.7
6	Increased Your Employment Opportunities	2.4	1.1	2.2	1.1	2.2	1.1	1.2
7	It Persuaded You To Work Harder For More Hours.	2.3	1.2	2.2	1.1	2.2	1.1	1.0
8	Increases Your Household Expenditure	2.4	1.0	2.2	1.0	2.3	1.0	1.1
9	Increases Your Households Saving	2.0	1.3	1.8	1.2	1.9	1.2	0.9
10	Increases Agricultural Production	2.0	1.3	1.8	1.2	1.9	1.2	1.3
11	Increased The Market Opportunities	1.9	1.4	1.6	1.3	1.7	1.3	1.7
12	Increased Knowledge On Modern Agricultural Practices	2.2	1.1	2.0	1.1	2.1	1.1	1.2
13	Increased Skills In Modern Agricultural Practices	2.2	1.2	2.1	1.1	2.1	1.1	0.7

Source: Computed

** P < 0.01

* P <

0.05

CHAPTER VIII
SOCIAL DYNAMICS OF AGRARIAN TRANSFORMATION AND
DEVELOPMENT

In this chapter the case studies conducted among the farmers are highlighted. All the farmers from the sample villages are selected. The families with multiple characteristics of agrarian pattern are purposively chosen to represent the agrarian community. This chapter tries to provide qualitative understanding on the switchover from shifting to settled agriculture and its impact on tribal development by analyzing their case history which includes their experience and history of cultivation. The activities and pattern of transformation at the household level is mainly analyzed.

Case I: A Retired Teacher Settles in Agriculture and develops a Diversified Farm

Mr. Hmangaiha is the head of the family and he is 64 years. He is a pensioner and formerly a teacher. His family has 6 members and lives with his wife, two sons and two daughters. Two sons helped their family in the field while the two daughters still study and goes to colleges in Lunglei. This family belongs to non-poor (APL) in socio economic category. He used to practice shifting cultivation while he was a school teacher.

After retirement in 2010, he started settled cultivation with his family. He owns two plots of land where the total area of land owned is 6 tins. He owns 3 acres of land under LSC which he bought from the villagers and the other 3 acres of land is a terrace possessed under PLP which he received from the village council. He started preparing terrace since 2009 using the financial assistance from the department of agriculture which was not enough to complete the work. So, he employed family labour as both the son provides labour force in land preparation.

He used to practice shifting cultivation but because of its low productivity, the family switched to settled agriculture. Moreover shifting cultivation is only like

socialization with the villagers. He mainly grows rice in jhum land and vegetables are grown mainly for consumption. He is happy when his family produces what they need in terms of food. He felt that most of the forests are destroyed because of shifting cultivation. The shortening of fallow period leads to decrease of production which really made him lose interest in jhum cultivation. Moreover more labour force is needed and employment is more frequency needed throughout the year therefore he felt that the amount of crops produced is not proportionate to the amount of input in terms of labour. In the mean time the government has also emphasized settled agriculture. He was convinced when he saw some successful farmers in his own village and on television. As he is on the brink of retirement, he felt that it would be a good employment opportunity for his sons and thus started settled cultivation. He also does not have many problems as compared to others in terms of capital as he is a government servant.

With so many struggles, the family started settled cultivation and he could continue settled cultivation mainly with the capital he received from government service and financial assistance from the government as well. As a farmer, he felt that settled agriculture is a very promising livelihood and it will contribute to the development of households especially in the rural areas. But many factors lower the level of development among farmers. He is not fully aware of the techniques and methods of farming certain crops, and also many crops are cultivated on the advice given by the government departments. He felt that as a cultivator he does not have a choice in crop selection and the family has to cultivate what the government department emphasised in order to get support from them. Besides this, he felt that the agricultural policy is politicized aiming at political gain and not development. The government also gave a very minimal awareness and training to the farmers which are sometimes not reliable.

He cultivated Rubber, Teak, Coconut, Litchi for market and other vegetables for consumption. He planted 500 Rubber trees and 50 teak trees. He also planted some vegetables such as Beans, Mustard, Korean Raddish which are grown for consumption as well as for commercial purpose. He also planted Banana as the seeds of Rubber and Teak are insufficient to cover his land area. He also had a fish farm in the field which also serves as an important water source for the crops. 3 Quintals of fish was produced last year which adds to the income of the family. Some of the crops are not yet mature to contribute to the family income. Altogether, the family has an annual income of Rs 50,000 from agriculture alone excluding consumption. According to him, settled agriculture does not contribute much to development but being settled in farming lowers the amount of input by the farmer which motivates the people to switch their farming system from shifting cultivation to settled agriculture. With this limitation, he continues settled cultivation as there is no other livelihood option especially in the rural areas.

From this case it could be identified that capital enables the farmer to switch to settled agriculture. The family stopped shifting cultivation mainly because of low productivity. The farmers are lacking reliable assistance and reliable seedlings. Diversified occupation could be observed which is mainly because of the advice from the government departments to cultivate their own department's portfolios. The activities of the government departments are not integrated which makes the farmer confused as to what he should cultivate. Insufficiency of seedlings is observed which make the farming process stagnant.

Case II: A well trained cultivator who inherited land from his father

Mr. Rinawma is the head of his family comprising of 5 members. He lives with his wife, two sons and one daughter. His daughter has joined as a teacher under SSA recently. Their family belongs to non-poor (APL) category as per the village council

classification. They own 15 acres of land under PLP which he inherited from his father and the entire area of land is used for cultivation. He practices shifting cultivation till 1995 and later on he stopped as he believes that settled cultivation is more sustainable and more productive. The main source of their family income is cultivation which is more than Rs 1, 00, 000 at present. As production depends on the weather and climatic conditions of a particular year and season, he says that his income also differs from time to time.

Many crops are not cultivated from the beginning as it is too hectic for the family. The family started cultivating one crop in a year and they keep on adding some crops every year. Crop selection is mainly according to the awareness given by the government. He practiced settled agriculture since 1989 and at first he planted Teak with the help of the government department and some fruits like oranges, mango and banana were already planted by his father. The main crops grown presently are Teak, Zawngtah (Bitter Beans), Orange, Oil Palm, Rubber, Banana, Pineapple, Mango, Lemon, Thing Rai and some vegetables according to the season. The reason for cultivating different crops is mainly because the crops support each other and it is more secure as he learnt from the experience of his father. Moreover, amount of crop production highly depends on climate. So, in the unproductive seasons, the other crops provide income for the family. Moreover he has learnt from experience and from training given by the government that crops support each other for their survival as for example Oranges are protected from heat by Banana trees during the beginning of their plantation. Pineapple and Banana were also planted by him as they can produce fruit in a year which supports the family. It brings income while waiting for the other crops to also make contributions to the family income. He is a beneficiary of the old in the year 1999 and recent NLUP in 2012 under trade of Rubber plantation. However he planted rubber only to get the assistance but used the

assistance on his field for land preparation. For irrigation, he prepared rain water harvesting tank at the upper site of the field with the help of the government which provides enough water for the field in dry season. This is one of the main reasons for his success in cultivation. In the water storage, he has incorporated a fish farm which sometimes generates annual income around Rs 5000 besides their consumption. This fish farm is encouraged by the fishery department but no proper assistance was given except in terms of seedlings. Labourers are mainly employed especially in the weeding season and the rest is managed with their household labour force. He usually prepares organic manure for his field, a technique he learnt from training given by the government through Agriculture Technology Management Agencies operated under the Agriculture department in Lunglei district.

Settled agriculture needs passion for its success according to him. The family usually spends any money they received on developing their field. According to him, settled agriculture is a very promising practice which brings development for the family. Although the farmers might not be educationally qualified for other job, cultivation does require more experience and training. He usually attends the training and awareness regarding agriculture which is very useful for his operation. There are many obstacles faced as the government supply of subsidised seeds is usually late and were distributed in the off season. Sometimes the number of seeds is minimal and the quality is not reliable for farmers to put their efforts into. The market for some crops are not too problematic as selling is done in their field which is undertaken by the seller especially the crops which could be consumed without preparation. Even Oil Palm produced for the first time is purchased on the spot by the company as promised. Since the production on every crop is still not of very large quantity, marketing is not systematized and the rate is also not fixed. The farmers have not much security in production and sale.

Crop diversification is high and the number of land owned is also large. The main reason for crop diversification is the government but he uses it as a support for other crops. The crops support themselves in failing seasons and also to protect each other like banana cultivated to protect smaller plants from heat. As a successful cultivator, the government also chose his family to cultivate Oil Palm which is a new phenomenon. His passion and being a beneficiary of both old and new NLUP has led him to succeed in farming. The annual income of the family reaches 2 lakhs. The government failed to supply seedlings on time and sometimes they are supplied in off season which affects the quality of cultivation. Market is always a problem as the rates are not fixed.

Case III: A cultivators who owns land but still practice shifting cultivation

Mr. Ruata is the head of the family and the strength of family is 7 members. He lives with his wife, two sons, two daughters and a daughter in law. The family belongs to BPL family. Agriculture is the main occupation of the family since his forefather's time. He owned 3 acres of land under LSC which was purchased from the villagers in 2010 and 3 acres of land allotted by Village Council on common land for 1 year. He started practicing Settled Agriculture since 2004 and till today he practices Jhum cultivation. He could somehow earn his living through shifting cultivation before but he uses the shifting cultivation method as a source of additional income. As the ecological impact of jhum cultivation is strongly criticised and emphasis is made on commercialisation by the government, he even thought of stopping traditional jhum cultivation. Moreover the products are low in jhum cultivation. Although he switched over to settled agriculture, there was no immediate income which led him to continue cultivating on common land. Although he continues Jhuming, he cultivated only commercial crops and Ginger is cultivated as a replacement of rice and vegetables in the jhum field.

He cultivated only commercial crops in settled land as jhum cultivation is not productive enough compared to the amount of input made in a year. When he started settled agriculture he planted Orange, Banana, Lemon, Zawngtah (Bitter Bean), and Coffee mainly for commercial purpose and some few vegetables in some part of the settled land for consumption. Most crops are selected as they could produce fruit after a few years so that the family does not have to wait for long and also because of the influence of the neighbours through their experience. The family looks after the field without employing labour force. Weeding machine is also utilized which was purchased by the family from the market. He is a NLUP beneficiary in the year 2013 under the orange trade. But the financial assistance that he received was used for buying a weeding machine which is not supplied by the government and planted 50 new trees of oranges as he had already planted 100 orange trees. Moreover the assistance he received from the government for land preparation and seedlings were all used properly. Although the assistance from the government was not enough, it gave him the enthusiasm to move ahead.

According to him, Settled Agriculture is not a very secure livelihood option. This is mainly because of some crops such as Rubber, Teak, Oil Palm, Oranges, Mango etc that need around 5 to 10 Years to produce and contribute to the income of the family. The family needs immediate income as they switch over from Shifting Cultivation. Some crops failed to produce fruits due to natural calamities like draught, cyclone and even global warming also greatly affects the seasonality of the crops. He has to depend on his own experience as most training from the government is not helpful for the farmers as more input and capital is needed. The practice and experience of the neighbors have a deep impact on their cropping pattern especially in technique and time of implementing. Many training includes lots of language that are not native and the equipment and

material are not available to him especially the farmers in rural areas. He prepares organic manure in his own field and supports himself. Moreover irrigation is the main problem as he could not afford to prepare rain water harvesting system in his field. He somehow felt that crops can still survive without irrigation but knows that crops will be better if irrigation is available in the field. Moreover he felt that irrigation is needed only to grow winter crops. So he waits for the opportunities to prepare rain water harvesting system and still plans to grow winter crops such as vegetable which could produce within a year.

He cannot save as the market is not helping them to have higher income and in the mean time the expenditure on cultivation is very high. There is no organised market and prices are not fixed, which poses a huge disadvantage for the farmers. He needs to lower the price of products made from his field as compared to other villages because of poor transportation facilities as the cost of transport is higher than other places. There is no proper price fixed from the government and lot of bargaining is experienced from a commissioner who came to buy in their locality. So the amount of his income is lower on the same amount of produce as compared to other places. But he depends on the commissioner who comes to buy their products as he does not have to worry much about selling even though the price might be lesser. He was hoping that when the road condition became better the cultivators will have more income and the farming system will improve.

From the case presented above, it could be observed that he started practicing settled agriculture not a very long time ago and transformation cannot be fully observed. Commercialisation of cropping pattern could be observed even in shifting cultivation. The crops such as rice, vegetables for household consumption are replaced with cash crops like ginger, chili etc. even in Jhum land. The employment of weeding machine bought from the financial assistance under NLUP is an advantage wherein other labour forces

need not be employed from outside. The family depends on the experience of the neighbours mainly because trainings given by government are not farmer friendly. They are hard to understand as it includes languages which were not regional. The main problems faced in the process of transformation of agriculture are irrigation and lack of market facility. Moreover, poor link roads increase the cost of cropping and transportation of products which absorbs a huge portion of the surplus of a farmer's cultivation.

Case IV: A Settled Cultivator Who Grows Cash Crops in Jhum land

Mr Tluanga is the head of the family and a teacher in government school and lives in Muallianpui with his wife, three sons and one daughter. The family owns 8 tins of land where 5 acres is under PLP which he purchased from their neighbours in the year 2002 and also currently practices Shifting Cultivation on common land. He started practicing Settled Agriculture since 2003 by planting Oranges. He used to be a jhum cultivator and he was self sufficient but productivity of the land decreased and later he could hardly produce enough for his family. He felt settled cultivation to be more productive and sustainable. With the influence of commercialization, he grows commercial crops like Ginger, Chili along with Rice on jhum land. Rice is mainly cultivated for consumption. In the Settled Agriculture land he planted Rice, Soya, Orange and some vegetables for consumption. Orange is selected as the market opportunities are better than other crops. The family had annual income of Rs 1,50,000 from agriculture alone but the expenditure on cultivation is high in settled agriculture and saving is still not possible as land preparation needs more capital.

Labour force is employed as the head of family is a government servant and could not give much time to agricultural work. The wife took care of the field using the capital from government service. The family does not face much problem regarding cultivation as compared to other families and the pressure is lesser as the family had other source of

income apart from agriculture. Marketing is not perceived as a very big problem for him as most of the products are purchased by the commissioner on their field. This is also possible as the produce is still less and market is still not a very big issue except the price which is bargained by the commissioner and he has to accept. But the crops are sometimes destroyed by insects which reduced the amount of production. He does not have proper training regarding cultivation except from Radio and Cable television. He needs to do weeding more than 3 times in a year and therefore he bought weeding machine from their own capital which helps him to save time and labour force. He prepares organic manure by himself which he learned in training given by the government and also from listening to radio programmes. He is a beneficiary of NLUP under orange trade and uses the financial assistance for land preparation. The seedlings he received from the government is not good enough and many of the seedlings he planted in his field died after plantation. This is also because of the late arrival of the seedlings and he had to plant the seedlings without much hope. He therefore wasted a lot of his resources which is difficult to recover.

According to him, Settled Agriculture is a very promising trade but the farming process in Mizoram needs security and support from the government. He still has to depend on his own experience and also their neighbours, advice. Weeding is not a very big problem for him because he owns a weeding machine. Irrigation is absent in his field because his field is located in a rough terrain and irrigation from river sources is not possible in a hilly region other than harvesting rain water. He lacks capital for constructing rainwater harvesting system as it requires a huge amount of money. Many government schemes do not reach the farmers especially in the rural areas and they even are not aware of certain schemes of the government. Sometimes he felt that he cannot abandon shifting cultivation as most families need income while they wait for their crops

to produce fruits which requires more than 5 years. But due to commercialisation of farming system, the major crops grown in jhum land are also commercialised and they are cultivated together for consumption.

The family use cultivation as a supporting occupation which is convenient especially in rural areas. As the head of family is a Government servant, the wife took responsibility for cultivation and labour from outside are employed which is possible mainly because of the availability of capital. In the process of transformation, the family still practices Jhum because of the influence of commercialisation and want of more financial income. The cultivation of cash crops in Jhum land is an emerging trend for the farmers where the family used it as financial support in the beginning of transformation to settled agriculture. This clearly indicates that cultivation of cash crops in Jhum land requires lesser input and time for farmers. Although the family does not receive much assistance from the government, they manage by preparing organic manure and rain water harvesting system for their field. The family receives training mainly from All India Radio and Doordarshan which are somehow sufficient for the family. This has resulted in development of the living conditions of family and the annual income from agriculture has also increased.

Case V: A farmer who receive land from the government

Mr Siama is the head of the family with 6 members. He lives with his wife and four sons in Tawipui South and has practiced shifting cultivation for more than 30 years to support his family. He stopped shifting cultivation 5 years after he started Settled Agriculture in 1977 and he planted Banana and Orange. He stopped shifting cultivation as the labour input is high and in times of crop failure, the family does not have savings. He owns 5 tins of land under LSC which he got from the government.

In his field, the family cultivates Orange, Banana, Lemon, Pineapple and some vegetables which are for consumption. Orange is selected as the market opportunity is better than other crops and local market is also available. The crops are sometimes destroyed by insects which greatly reduce the amount of production especially the Orange. The family has an annual income of Rs 1,00,000 approximately from agriculture alone. The family works full time and all his sons work in the field but few labourers were also employed in the rainy season because the weeds grow at a fast rate. He does not have proper training regarding cultivation except from Radio programmes. Weeding needs to be done more than thrice a year so they utilize a weeding machine hired from other farmers. Manure is prepared by them for some time but later on they stopped as he felt that the field could survive without manure. The cost of preparing and purchasing manure is high and moreover the rate of supply is not regular for the rural areas. This discourages the farmers from depending on manure for higher production.

According to him, Settled Agriculture is not a very promising trade because of its insecurity but the family has no other choice to support itself. The family has to depend on their own experience and their neighbours as well. Weeding is not a very big problem for the family. Many government schemes do not reach them and even when there is subsidised seeds and manure distributed in their village, they do not have a chance to receive it as assistance are distributed among the political party members. The family wants to increase their farming area but do not have the resources to do it. The family members also earn their income from labour also. While their fields need no attention, they go to other fields to work as manual labourers. As the production is still not very large in quantity, the family does not have the problem in terms of market. The village is situated along the National Highway 54 which makes transport easy. Moreover the field

is not too far from the road which makes the cost of transport cheaper. The family is not a beneficiary of NLUP since they do not involve in politics.

From the case presented above, we can see that Mr. Siama is an experienced cultivator who has practiced shifting cultivation for more than 30 years and later on started settled agriculture. But the settled agriculture that he practiced is showing a weak rate of development which is mainly due to the fact that he is not a beneficiary of NLUP and because of politicization of the programme. Moreover, other assistance such as subsidised seedlings, manure and other equipments are out of reach as selection is mainly based on membership of political party. He depends mainly on his experience in cultivation and tools are not upgraded because of the lack of capital. The absence of security from the government in times of crop failure crippled the growth and development of his field. He practiced settled agriculture mainly due to the unavailability of other occupational opportunities. The family members also have other source of income as agricultural labourers in other fields.

Case VI: The insecure settled agriculturalist

Mr Buanga is the head of the family and he is 61 years old. He lived in Tawipui Village with his wife as their only daughter is married in another village. He owned 5 tins of land under PLP which he inherited from his father. He has practiced shifting cultivation more than 20 years. He mixed the two types of farming that is shifting cultivation and settled agriculture for many years. He used to produce sufficient for the family from shifting cultivation by growing rice and vegetables mainly for consumption. But as he grew older, he could not produce enough even for family consumption as the fertility of jhum land decreases due to shortening of fallow period. So he started practicing settled cultivation in the year 1980 hoping that the family will have better living conditions. He clears the land and plant crops that have more market value such as

fruits and vegetables. Although he has started settled cultivation, he still practice shifting cultivation as the settled agriculture does not yield products in the preparatory time. The family had no other source of major income except agriculture and the annual income is Rs 50,000 from agriculture alone. The family can support itself because some of the food items like vegetables are produced from their field. He always produces sufficient for the family from jhum cultivation but the production decreases as the fertility of land decreases due to the short jhum cycle.

Moreover, the couple is getting older and could not afford to clear forest and put a lot of effort as before. They require a permanent income pushing them to switch over to settled agriculture permanently since 2000. The family inherited land during from his father which was suitable for agriculture. He started practicing Settled Agriculture in the year 1980 by planting Banana and Orange. Sometimes he plant sugarcane also. He cultivated crops that are mixed and jump from one crop to the other as time goes by. Some crops are cultivated on the advice of the government and because of the supply of seedlings as well. Some crops like banana can produce fruit consecutively for 5 years and later need to be replaced even if they want to plant the same crops. The rotation of crops is also mainly due to the failure of crops like oranges and lemon due to insects and poor quality of seeds which fail to produce in certain conditions. Now he grows pineapples which started producing fruits from 2013. He never uses manure or pesticides in his field. But insects have destroyed their crops completely which sometimes reduces the production. He is a beneficiary of NLUP chosen for pineapple trade therefore he uses the financial assistance from NLUP for land preparation to add and improve to his pineapple cropping.

He is worried because both of them are getting older and they need to employ more labourers in their field which increases the expenditure. So the saving from

agriculture is almost impossible which is not secure for his family. Lack of market is a problem as he cannot bring his products by himself to the market in the city and so a lot of time is wasted in selling. The available local market is the only option they have for market which is very limited for them as the prices are bargained at a low price in local market.

This case highlights the insecurity of settled agriculture as the livelihood of the family is not secure. The reason of switching over to settled agriculture is mainly because it is more productive than Jhum and the land preparation especially clearing of forest, distance of field from the house is sometimes far. The quality of fruits produced is not inferior to other production though chemical fertilizers are not used. The family utilized the assistance from NLUP in a very meaningful way and it shaped the agriculture of family to develop. Assistances are not received from the government and training from the government is not considered useful. Although the family practiced settled agriculture, vegetables for consumption are usually cultivated to support family economy.

All the above cases highlight the process of agrarian transformation from shifting cultivation towards settled agriculture. In the perception of the farmers, the main reason for switch over from shifting cultivation to settled agriculture is the expectation that the transformation would enhance their livelihood though increasing agricultural production and productivity. The new land use policy of the government of Mizoram with support from the central government has also provided necessary support. The transformation brings commercialisation in cropping pattern but in the mean time cropping for domestic consumption has not stopped completely. In the process of transformation, most of the cases reveal that the trainings and techniques of farming given by the government are not effective for majority of farmers especially among rural farmers. The trainings provided were also not applicable for the farmers and sometimes it includes other languages other

than regional language which are hard to understand for the farmers. The farmer sometimes felt that the information given in trainings is not reliable because even the strategy emphasised by the government also changes within a very short time and the farmers were forced to change the system within no time which requires lots of capital and waste the time of farmers. Moreover, the supplies of seedlings were not reliable and sometimes the quality is very low. The supply of manures and pesticides are almost absent and the farmers have to buy it themselves which is possible only to farmers who are financially capable. Moreover it is not available in rural areas. Some of the households have practiced settled agriculture for a long time but even such households are not economically developed. This gave rise to a series of question like; ‘will the development of household economy caused by agriculture transformation be sustainable in the future?’ This assumption arises in the process of case study because most of the farmers do not select their own crop to be cultivated but were instigated by the different government departments who have interest only in their areas and project. Without any study on the condition and status of the farmers, they just introduce the crop under their project. There is no security on the side of the farmers on crop failure and natural calamities as no insurance is given to them. The farmer without choice has to cultivate as the government proposed for want of assistance from the government. Oil Palm cultivation emerged which is a new phenomenon in the southern areas of Mizoram. With this, a category of contract farmers emerged as Ruchi Soya Company writes Memorandum of Understanding with the government. The company provides seedlings, training and promises to buy the products at the price fixed by the board. The use of machinery also started which will possibly help the farmer to cultivate more land with lesser amount of expenditure and time. Cultivation of cash crop such as Ginger, Chili and Tobacco etc. on Jhum land is a new trend that is emerging in the process of

transformation of agriculture influenced by commercialisation of settled agriculture. The main problems faced are not different from the quantitative data in the present study such as lack of irrigation, lack of market facility, no crop insurance, less supply of manure and pesticides etc. The cultivators have no other choice for their livelihoods except farming which held the government responsible for the development of the cultivators.

In this chapter, six case studies of farmer households were presented to understand the social dynamics of agrarian transformation and tribal development. In the next chapter, the findings of this chapter and earlier chapters on results and discussion will be summarized.

CHAPTER IX

CONCLUSION

The present study aimed at assessing the impact of agrarian transformation from shifting cultivation to settled agriculture on tribal development in Mizoram. The study has employed qualitative and quantitative methods to collect data. The quantitative primary data collected through pretested structured household interview schedule was collected and analysed to probe into the pattern of transformation in agrarian structure in the wake of transition from shifting cultivation to settled agriculture. It was also probed into gauge the effect of the transformation on the livelihood and living conditions of the rural households. Case studies were used to probe into the dynamic transformation of agrarian transformation and its impact on the livelihood and living conditions of the rural households. In the chapters 4th, 5th, 6th and 7th the results of quantitative data analysis are presented while in the 8th chapter the case studies are presented. In this chapter, an attempt has been made to summarise the results of these five chapters. Apart from the findings, the conclusion and suggestions of the present study are presented in this chapter.

This chapter is presented in three major sections. The first section summarises the major findings. In the second section, conclusion is presented while in the third section suggestion for policy and social work practice are presented.

9.1 Summary of Findings

The findings are summarised in terms of six subsections viz., Social Structural bases of Cultivators, Agrarian Structure and Transformation in Mizoram, tribal development, agrarian transformation and tribal development and Agricultural Challenges and New Land use policy and social dynamics of transformation and development.

9.1.1 Social Structural Bases of Cultivators

The primary question that arises here is with reference to the differences in social structural background between the shifting cultivators and settled agriculturists. The demographic, familial, social and economic background characteristics of the respondents and their households were probed into.

The demographic structural characteristics of the respondents analysed include the population attributes viz., gender, age group and educational status. The pattern of gender distribution of respondents among the shifting cultivators and settled cultivators show no difference. On the whole, majority of the respondents were male. The data collected were mainly from adults and heads of households who belong to working age sharing their experience. The pattern of age distribution shows that the shifting cultivators are younger than the settled agriculturalists respondents. The educational pattern shows that majority of the respondents were literate but with low educational qualification as Primary level are majority. The pattern of distribution of the respondents across the levels of education among the both the categories of cultivators are similar to the overall pattern. However, the settled agriculturalists respondents seem to have slightly higher level of education as compared to those of the shifting cultivators.

Family is one of the primary institutions in every society. So, the family structural bases of the respondents are described in terms of four characteristics viz., types of family, size of family, forms of family and gender of head of family. Both the types of family such as nuclear family and joint family could be observed and majority of the respondents belong to nuclear family among both shifting and settled cultivators. This is mainly because of the Mizo tradition where the male members except the youngest move out to form new family after marriage. The size of family determines the strength of working force among families depending upon agriculture as a source of livelihood. The

size of family among the cultivators is not so big and medium size family constitutes the highest proportion followed by small size family and large size family is less. The size of family is comparatively larger among the shifting cultivators than the settled agriculturalists. As regards the form of family, of the three stable, broken and reconstituted, the majority of the families of shifting and settled cultivators were belonging to stable form of family. With regard to the gender of the head of family, male headed families has more contribution in farming and a male headed household constituted the majority among both the types of cultivators.

Social structure is a pattern of social arrangement in society that are both emergent from and determinant of the actions of the individuals. Social structural characteristics of the respondent households that are discussed include sub-tribe and religious denomination of the respondents. *Lusei, Paite, Ralte and Hmar* are the sub-tribes found among the respondent households. Lusei sub-tribe constitute the major sub-tribe where Paite comes second. Ralte and Hmar also were next in their proportion. A similar pattern is observed among the shifting cultivators and settled agriculturalists. Almost all respondent households were Christian but profess different denominations such as Baptist, Presbyterian, UPC (NE), UPC (Mizoram), Seventh day Adventist, Roman Catholic, and a few Christians without affiliation to any denomination. As data is collected in the southern part of Mizoram where Baptist constitutes the largest religious denominations, most of the respondents belong to Baptist Church of Mizoram. Presbyterians are very few although they constitute the major denomination in Mizoram, their concentration is in the northern Mizoram only.

The economic structural bases are discussed at the household level include occupational structure and socio economic category. The pattern of primary occupation among the shifting cultivators shows that cultivation is the highest followed by

agricultural labour and government service. Animal husbandry as a primary occupation is absent. But the pattern is slightly different among the settled agriculturalists where animal husbandry constituted the second after cultivation. Government service is absent among them. Diversification of occupation is found more among the settled agriculturalists as they are engaged in rearing of livestock such as pigs, cow, goat, poultry which is almost absent among the shifting cultivators. As regards the secondary occupation, the respondent households are more diversified than the primary occupation and the structure is similar among the shifting cultivators and settled agriculture. Agricultural labour forms the highest secondary occupation followed by animal husbandry, business, government servant, and cultivation. Although majority of the sample household do not have tertiary occupation, the occupational structure of cultivators has a diversified tertiary occupation. Animal husbandry, agricultural labour and Business are the main tertiary occupation.

The socio economic categorisation into very poor (AAY), poor (BPL) and non-poor (APL) by the village council is used to understand the socio economic status of the families. There is not much difference between both types of farmers regarding their socio economic status. The transformation of agriculture to settled cultivation has no impact on the status and livelihood of households which may be attributed to the fact that the transformation is still in its initial stages and results are yet to be seen.

9.1.2 Agrarian Structure and Transformation

The Agrarian Structure and Transformation in Mizoram is discussed in terms of the nature of land possession, ownership of livestock, cropping pattern, tools used in cultivation, input use and perception on ecological consequences.

The nature of land possession has been analysed in terms of five sets of indicators viz., number of plots possessed, area of land holding, distributions of land, duration of land holding and source of land.

The first dimension of agrarian transformation taken for analysis is the number of plots possessed. As regards the pattern of land distribution across the different modes of land possession (ownership) there is significant difference between the shifting cultivators and settled agriculturists. On the whole, more than one half of the land is reportedly under periodic land pass, which is followed by the land under LSC, Common land, and least under temporary pass. The pattern of land distribution across these four modes of possession among the settled cultivators is by and large similar to the overall pattern as majority of the respondent households are settled cultivators. On the other hand, most of the land with shifting cultivators is under common land, which is followed by PLP, LSC, and Temporary Pass. The average number of plots of land possessed by settled agriculturists is significantly greater than that of the shifting cultivators.

The second indicator is the area of land possession which is measured in terms of acres and analysed for differences in pattern and variation in size. The average area of land held by the settled cultivators is significantly greater than that of the shifting cultivators. It is clear that the switchover from shifting to settled cultivation results in increase in the size of land holding. The settled agriculturalists possessed greater area of land than the shifting cultivators. The pattern of area of land distributed across the various modes of ownership/possession is similar to that of the pattern of distribution of number of plots observed in the last section. Most of the area of land of the shifting cultivators is under common land (CL) while that of settled cultivators is under periodic land pass (PLP). On the whole, the order of distribution is periodic land pass, land settlement certificate, common land and temporary pass. The pattern of land distribution of land across these four categories among the settled cultivators is similar to the overall pattern. However, the pattern of land distribution among the shifting cultivators is different. The Common Land is the largest followed by PLP and LSC. The area under PLP and LSC are

significantly greater among the settled cultivators as compared to that of shifting cultivators. On the other hand, the area under common land (CL) is significantly greater for the shifting cultivators as compared to the settled cultivators.

The duration of land holding is the third indicator of structural change and transformation in agrarian structure in the context of Mizoram. The major feature of shifting cultivation is that its temporary and cyclical nature. Hence, duration of land holding is considered for assessing transformation. The pattern of duration of land holding across the modes is similar to those of the number of plots and area of land holding. It also follows the same pattern Periodic Land Pass (PLP), Land Settlement Certificate (LSC), Common land (CL) and Temporary Pass (TP) on the whole. The pattern of land possession across these four modes by the settled cultivators is similar to that of the overall pattern. The duration of Land holding under PLP and LSC is significantly greater among the settled agriculturalists as compared to the shifting cultivators. The mean duration of land under periodic land pass for shifting cultivators is 6 years while it was 10 years for settled cultivators. On the other hand, the duration of cultivation of common land is significantly greater for shifting cultivators as compared to settled cultivators. The mean duration of cultivation of common land worked out for shifting cultivation is 1 years while it was just 1 month to settled cultivators.

The fourth indicator studied for assessing the transformation in the agrarian structure in the wake of transition from shifting cultivation to settled agriculture is that of source of land. This is to know whether the privatisation of land ownership results in transfer of ownership. An open ended question was how the respondent got the land. There are two major sources of landholding or ownership viz., allotment by village council and purchase. Land under common land and TP held by both the shifting cultivators and settled cultivators were allotted by the village councils. On the other hand,

there are some who own land under LSC and PLP purchased land also. Though most of the respondent households do not own land under LSC, a significant proportion of them got land from village council and a few have purchased land also. The proportion of the respondents got land allotment by the village council is significantly greater among the settled cultivators as compared to the shifting cultivators who got land from village council. This clearly shows the emergence of market for rural land in the wake of land settlement. On the contrary, the proportion of the respondents who purchased land with LSC is slightly greater among the shifting cultivators as compared to those of settled cultivators. A similar pattern of source of land can be observed in the case of PLP also. The proportion of the respondents who have purchased land with PLP is slightly greater among the shifting cultivators as compared to the settled cultivators.

The fifth indicator of agrarian structure taken up for analysis is the pattern of distribution of land among the cultivators. The size of land in the present study has been classified according to the classification of the Ministry of Rural Development Classification viz., Marginal (Below 2 acres), Small (2-5 Acres), and Medium (5-10 Acres) on the basis of the total area possessed by them. As seen in the earlier section, the size of land holding increases with land settlement. The settled cultivators own slightly greater size of land holding as compared to the shifting cultivators. This overall increase in the size of land holding seems to be accompanied by increase in the inequality in the distribution of land. The Gini coefficients and the Lorenz curves clearly show that the inequality in area of land owned by the shifting cultivators is lower than that among the settled cultivators. Two major trends are emerging as transition from shifting cultivation to settled agriculture takes place. There seems to be operation of centripetal and centrifugal tendencies in the agrarian transformation due to the transition from shifting to settled cultivation. The first trend is embourgeoisement whereby the medium farmers are

becoming large farmers. This could be observed from the increase in the proportion of the number of households and proportion of area under large size of holding class as the cultivators switch over from shifting to settled cultivation. The proportion of large farmers among the settled cultivators is greater than that among the shifting cultivators. Similarly, the proportion of area under large holdings under shifting cultivators was significantly lower than that among the settled cultivators. On the other hand the proportion of the medium farmer households among the settled cultivators is significantly lower than that among the shifting cultivators. Similarly, the proportion of the area with the medium farmers among the shifting cultivators was greater than that among the settled cultivators. The second trend is similar to that of proletarianisation. In the context of Mizoram, though the cultivators are not becoming labourers and depeasantisation is not taking place, the small farmers are becoming marginal farmers and the proportion of number of households increases while the area under small size of landholding class decrease.

Livestock ownership is the sixth indicator of agrarian structural transformation which is one of the sources of livelihood in tribal communities from time immemorial. Livestock can be construed as one of the forms of capital or livelihood assets viz., natural capital and plays a vital role in sustaining the well being of households in rural and tribal areas. In the context of Mizoram, it was customary for the Mizos to rear only pigs while cow rearing was unknown (Lalengzama and Kanagaraj 2013). In an earlier study, Lalengzama and Kanagaraj (2013) found the emergence of cow rearing practice among the settled cultivators along with transition to settled cultivation from shifting agriculture. They observed significant increase in value of livestock owned as result of switch over to settled cultivation from shifting cultivation. They also observed livelihood diversification due to the increase of livestock ownership. The livestock owned among the shifting and

settled agriculturalists in the present study comprises of six types viz., Pigs, Cow, Poultry, Fish, Goat and Horse. There is significant difference in the total value of livestock owned between the shifting cultivators and settled agriculturists. It is clear that as the farmers switch over to settled cultivation from shifting cultivation there is no change in the livestock owned by them. The observation in the field shows that the rearing of cows has emerged among the shifting cultivators also. The cow rearing is emerging which is assumed to be mainly because it is one of the trades selected under NLUP. The settled cultivation and livestock rearing are interdependent as the bi-products of cultivation are useful to feed the livestock. Moreover in return livestock rearing helps in weeding and they also supply organic manure for the cultivation (Lalengzama 2011).

Cropping pattern is the seventh aspect of agrarian structural transformation probed in the present study. The question here is that how cropping pattern changes in response to transition from shifting cultivation to settled agriculture. A remarkable feature of shifting cultivation is crop diversity. Datta (1992:32) reports that almost all varieties of cereals and vegetables are grown in one field, which is rather impossible to have in wet plain land. Zaitinwawra and Kangaraj (2008) reported similar picture of diversity among the crops. They have also reported that a cropping pattern shift from food crop to vegetable crops and also a shift from subsistence cultivation to commercial agriculture as the transition from shifting cultivation to settled agriculture happens. A recent study by Lalengzama and Kanagaraj (2013) also found similar changes in the cropping pattern due to the transition. They held that the transition from shifting to settled cultivation resulted in commercialisation and emergence of mono cropping with a single vegetable crop. The differential patterns of cropping across the shifting and settled cultivators in the present study has been probed in terms of number of crops cultivated by farmers, number of farmers cultivating different crops, purpose of cropping and area under cropping.

Number of farmers cultivating the different types of crops is the first indicator of cropping pattern. The pattern of cultivation of different crops by sample households differs between the shifting cultivators and the settled agriculturalists. On the whole, the majority of the respondent households cultivate fruits which are followed by the proportion of farmers cultivating Tree Crops, Vegetables, Cereals and Oil Seeds. The cropping pattern of the settled cultivators is similar to that of overall pattern. A different pattern of cropping could be observed among the shifting cultivators. The cropping pattern among shifting cultivators shows that Cereals and Vegetables are cultivated by most of the farmers which followed by those who cultivate Fruits, Tree Crops, Oil Seeds and Pulses. The proportions of farmers cultivating commercial crops such as fruits, tree crops and oil seeds are significantly greater among the settled agriculturalists as compared to those of the shifting cultivators. On the other hand the crop meant for subsistence i.e. cereals are cultivated by a greater proportion of the shifting cultivators than the settled agriculturalists. However, the proportion of farmers cultivating the vegetables is more among the shifting cultivators as compared to the settled agriculturalists. The results of analysis of number of farmers cultivating different crops clearly show that the shift from subsistence to commercialisation has happened in the context of the present study too as already reported (see Lalenzama and Kanagaraj 2013; Zaitinvawra and Kangaraj 2008).

The second indicator of cropping pattern is the number of crops cultivated. In earlier studies on shifting cultivation, significantly greater number of crops cultivated by shifting cultivators over the settled cultivators were reported (see Lalenzama and Kanagaraj 2013; Zaitinvawra and Kangaraj 2008). The number of crops cultivated is greater among the shifting cultivators as compared to the settled agriculturalists. However, this difference in the number of crops cultivated between the shifting cultivators and settled agriculturists are not statistically significant. This result is contrary

to the observation made in the earlier studies on agrarian transform in Mizoram (Lalengzama and Kanagaraj 2013; Zaitinvawra and Kanagaraj 2008).

The third indicator of cropping pattern is that of area under crop which is used by most of the scholars. As measurement of area is difficult in the context of Mizoram because the farmers do lack the knowledge and in the hilly topography of land further complicates the measurement. In addition to area, the number of crops and farmers were used as indicators so as to gain greater clarity on the matter. The area of cropping in the present study is measured in acres analysed for variation in the pattern and level. There is no significant difference in the gross cropped area under cultivation between the shifting cultivators and settled cultivators. The settled cultivators had significantly greater area under cultivation of fruits, tree crops and oil seeds while the shifting cultivators have significantly greater area under cultivation of cereals, and vegetables. Crop diversity was assessed in terms of Simpson's Index of Diversity (SID). The crop diversity index value is significantly greater among the shifting cultivators as compared to settled cultivators.

Earlier studies on transition from shifting to settled cultivation showed significant qualitative transformation from subsistence to commercialisation in the Mizoram context (see Lalengzama 2011). Closer observation in the field shows that it is a matter of attitude and motivation rather than the crops themselves can be classified as commercial and subsistence. There are three purposes identified. They are for household consumption, for market and both for household consumption. The results of analysis of the purposes reveal that greater proportion of the settled cultivators is producing crops for selling them in the market while a greater proportion of shifting cultivators are producing for both market and household consumption. Thus the idea of the production for market has entered into the minds of the shifting cultivators also.

Tools and its uses form technology which is necessitated for economic development especially in agriculture (Zaitinwra and Kanagaraj 2008). Studies on tool use and its implementation among the Mizos is also studied by the Thangchungnunga (1997), Lalengzama (2011), Lalengzama and Kanagaraj (2013). The tools used by the respondent households in farming in the present study are classified into four types such as Forest clearance tools, Weeding tools, Harvesting tools and Irrigation tools. On the whole, land preparation tool is used by the largest number of cultivators in the present study which is followed by Forest clearance tools, Harvesting tools and Weeding tools. The switchover from shifting cultivation to settled agriculture resulted in the decrease of forest clearing tools and increase in land preparation tools. The number of farmers employing Land preparation tool is almost the same between both the farmers but the settled agriculturalists employ more than the shifting cultivators. Surprisingly, forest clearance tools are also almost the same but higher among settled agriculturalists as compared to shifting cultivators. As different crops needs specific harvesting tool, harvesting tools is more employed by the shifting cultivators more than the settled cultivators as crop diversity is more among the shifting cultivators. Weeding tool is employed by both the farmers where settled agriculturists are slightly more than the shifting cultivators. The lack of agricultural tools is a major problem in Lunglei district which clearly indicate lower development in agriculture as compared to other districts (GOM 2014). There are 13 tools used by the shifting cultivators and 16 tools used by the settled agriculturalists in the present study area. The pattern of number of tools is different among both the shifting and settled cultivators. The shifting cultivators use forest clearance tools as the highest followed by the weeding tools, Land preparation tools, harvesting tools and irrigating tools are absent. In the mean time a different pattern is seen among the settled agriculture where the proportion of use of forest clearance tool

is the highest which is followed by land preparation tool, weeding tools, harvesting tools and irrigating tools are absent.

Many Economists believe that the level of productivity, production and income of the cultivator is determined by pattern of inputs used in cultivation. Input use has a series of impact on agriculture and agricultural production declined primarily due to reduced inputs and credit supplies especially in settled agriculture (Moyo, 2011). Sachchidananda (1989) observed the changing patterns of input use in terms of increase in use of chemical inputs, human labour and animal power as the transformation from shifting cultivation to settled agriculture takes place.

The input use among the respondents' household in the present study is analysed in terms of use of Seeds, Human Labour, Animal Labour, Machinery, Manure, Pesticide and Irrigation. Seed is a primary input. The seeds used by the respondents are Local Seeds and High Yielding Variety Seeds (HYV). The Local seeds are used more frequently than the HYV seeds among both the type of cultivators. The frequency of use of local seeds is significantly higher among the shifting cultivators as compared to the settled agriculturalists which is mainly because of the unavailability of HYV seeds and lack of technical knowhow to cultivate High Yielding Variety Seeds. The use of High Yielding Variety Seeds is comparatively more among the settled agriculturalists as compared to shifting cultivators which are mainly from the supply of government and from the market. The same finding was observed in Aizawl district of Mizoram by Lalenzama (2011). In the process of switchover, the Mizo farmers change the type of crops from local to Hybrid seeds which they believe as more productive and easy to look after which is strongly emphasised by the government departments especially agriculture department and horticulture department in their own areas.

Human labour is an inevitable input in cultivation whether the form of it is shifting or settled. Human labour among the respondent households in the present study is categorized into male hired labour, female hired labour, male family labour and female family labour. There no significant change in the frequency as well as pattern of human labour use. Contrary to reports in the increase in the human labour use due to transition from shifting cultivation to settled cultivation, there is no significant difference in the frequency of use of male hired labour, female hired labour, male and female family labour. On the whole, the male hired labour use was greatest which is followed by the female labour use, use of female family labour, and male family labour. The same pattern could be observed across the shifting cultivators and settled cultivators. The frequency of employment of male hired labour is similar among the shifting cultivators and the settled agriculturalists. The frequency of employment of female labour is slightly higher among the shifting cultivators as compared to the settled agriculturalists as the female members have more work in jhum cultivation especially in weeding and harvesting. The employment of male and female family labour is higher among the shifting cultivators as compared to the settled agriculturalists which indicated that more input in the form of labour is required in shifting cultivation Moreover Mizo had a traditional way of helping each other in Jhum cultivation called '*In Lawm*' where services are rendered to each other and this increases the number of employment of free labour.

Animal labour use in agriculture is a major feature of settled cultivation in India. Animals especially bulls and buffaloes are used in agricultural operations such as ploughing, threshing and transportation of harvest and inputs. Employment of animal labour is absent among both the shifting cultivators and the settled agriculturalists in the present study area. This is mainly because the area of land holding in the area of study is small and the terrain is slope which restricts the use of animal labour to some extent.

Use of machines in agriculture is a modern phenomenon which is believed to enhance production and reduce the cost of production. The employment of machinery by the respondents in the present study is categorised into owned and hired. The results of analysis of data shows that the employment of machinery is absent among the shifting cultivators but a few among the settled agriculturalists have started using it. This shows that the employment of machinery emerges among the settled agriculturalists in southern Mizoram.

Timely access to fertilizer emerges as one of the most forceful determinants of yields and their consistency (Arslan.et.al. (2015). Commercial certified organic agriculture has spread to over 130 countries worldwide and demand for organic pesticides is driven by belief that organic pesticides are more healthy, tasty, and environmentally friendly than conventional products (Lotter, 2008). Hence, the manure used by respondents in the present study has been categorised into Organic Manure, Chemical Fertilizers (major ones viz., NPK) and Chemical Fertilizers (Minor) (see Table 5.11).

There is no difference in the pattern of manure use between the shifting cultivators and settled cultivators, the latter use the organic and chemical fertilisers in greater frequency as compared to the former type of farmers significantly. One very promising finding is the use organic manure is the highest among all the fertilizers. On the whole, use of Organic fertilizers as an input among the respondents is the highest which is followed by Chemical Fertilizers (NPK) and Chemical Fertilizers (Minor). Use of organic fertilizer is significantly higher among the settled agriculturalists as compared to the shifting cultivators. The use of NPK Chemical Fertilizers and Minor Chemical Fertilizers are also higher among the settled agriculturalists which indicated that sedentary form of cultivation requires more input in terms of manure.

Pesticides use in Agriculture is practiced in India for centuries but use of the poisonous chemical pesticide is a modern trend fuelled by agricultural extension agencies. The pesticide used by respondent households in the present study is categorised into organic pesticides and chemical pesticides. In the pattern and frequency of use of pesticides there is no significant difference between the shifting and settled cultivators. Both organic and chemical pesticides are used rarely. On the whole, both the farmers used Organic pesticides and chemical pesticides equally. The data might show low rate of input in terms of pesticides among the farmers it is indicative of the fact that use of pesticides has no much effect and contribution in agrarian transformation in Mizoram.

Production in settled agriculture depends heavily on irrigation (Ajami 2005). There are some who argued that high levels of irrigation and mechanization have ensured high incomes from the cultivation (Kannan, 2015). The inputs use in irrigation in the present study has been categorised into dependence on rainfall, rain water harvesting and water from river. In the pattern and frequency of use of various sources of irrigation viz., rainfall, rain water harvesting, and river water are not significantly different between the shifting and settled cultivators. Both of them mostly depend on rail fall and use rarely practice the rain water harvesting or using river water. The dependence on rainfall is still the highest among both the farmers followed by rain water harvesting and water from river. Although some rain water harvesting mechanism was introduced among the settled agriculturalists, the process of agrarian transformation in Mizoram lack improvement in irrigation which is vital for the development of agriculture especially sedentary form.

The perceived ecological consequences of shifting cultivation among the cultivators in the present study are rated by the farmers constitute the last dimension of agrarian change. As a whole there is no significant difference in the farmers' perceptions on different problems viz., soil erosion, loss of top soil, loss of forest, fire accidents due

to Jhum fire, water retention capacity of soil is reduced, reduces rainfall, loss of wild animals, birds and insects.

Agrarian transformation from shifting cultivation to settled agriculture in the present study highlight the relationship between five interrelated aspects of agrarian structure viz., nature of land possession, ownership of livestock, cropping pattern, tools use, and input use using Karl Pearson's coefficient of correlation coefficients.

The Distance of the villages to the District Head quarters has been reported as an important determinant of Agrarian transformation. The villages located in the proximity to the district head quarters are expected to have better infrastructure, amenities, facilities and thus better forward and backward linkages. The distant villages have lesser proportion of settled cultivators as compared to that of the proximate villages. The distant villages have greater area of land under common land as compared to that of proximate villages. On the other hand, the proximate villages have greater area under LSC. Interestingly, the households in distant villages have greater duration of land possessed under PLP as compared to those in the proximate villages. On the other hand, the households in the proximate villages have greater duration of land under LSC. It is clear that the crop diversity is greater among the households in the distant villages as compared to the households in the proximate villages. The respondents in the proximate villages perceive greater extent of ecological consequences of shifting cultivation as compared to those in the distant villages. It is clear that the cultivator households in the distant villages more frequently use local seeds, major (NPK) and minor chemical fertilizers. On the contrary, the households in the proximate villages use more frequently HYV seeds and organic manure as compared to those in the distant villages.

The present study probed in to the level of agrarian transformation by comparing the living condition of shifting cultivators and settled cultivators. The proportions of

settled cultivators are more in the village near to the headquarters. The type of cultivation is having significant positive relationship with the area of land possessed under LSC. In other word the area of land possession is more among the settled cultivator household. On the other hand the area of land under common land, area of land and size of land holding are not significant. The type of cultivation of household in the present study also has significant relationship with the duration of land holding under PLP and LSC. Land possession for agriculture occurs earlier among the household near to the district headquarters and among the settled cultivators. The duration of land holding under common land declines significantly among the settled cultivators. The diversity of crop decrease among the settled cultivators but surprisingly the gross cropped area is not significant even at 5 per cent level. The use of local seeds declines among the settled cultivators while the use of HYV and organic manure increases significantly. On the other hand the use of minor and major (NPK) chemical fertilizers has no significant relationship with the type of cultivation.

The number of plots possessed by the cultivators is an important determinant of level of agrarian transformation and the number of plot is expected to increase as the agrarian transformation takes place from shifting cultivation to settled agriculture. The number of plot possessed increase among the settled cultivators while it decreases among the cultivators in distant village.

The area of land under LSC and common land possessed by the cultivators increases with the increase in number of land possessed by cultivators. Similarly the area and size of land holding also increases significantly. The duration of land holding under PLP decreases among the household who possessed more number of plot. The duration of land holding on common land and ownership livestock are not significant. When the number of land possession increase the gross cropped area increases but the diversity of

crops is not increased. The use of local seeds decline while the use of HYV and organic manure increases significantly when the number of plot possessed increases.

Area of land possession is an important indicator of the level of agrarian transformation in the present study and the area of land possession is expected to increase when the cultivators transformed to settled cultivation from shifting cultivation. The area of land possessed is more among the household in proximate area and also greater among the settled cultivators. The area and size of land possessed is greater among the cultivator households who owned land under LSC.

The household owning land under LSC have greater duration of land holding under LSC while the duration of land holding under PLP is less. The gross cropped area also has a significant relationship with the area of land possessed. It is natural that the household with larger area of land possessed have greater cropping area.

The household who owns land under LSC use greater HYV and organic manure and use of local seeds declined among them. The household who owns common land are having larger area of land holding and the gross cropped area and crop diversity also increased. The use of local seed is more among the household who owns common land. In the mean time the use of HYV seed and organic manure declines among the household who owns common land.

The gross cropped area increases among the household who have greater number and area of plot possessed. The cropping pattern is more diversified among the household who has a greater gross cropping area. When the cropping area increased the use of HYV seed and chemical fertilizers also increases. The use of local seed, organic manure and minor chemical fertilizer are not significant. Crops are more diversified among the household in the distant village and among the shifting cultivators household. Diversity of crops increased when the cropping area increased.

9.1.3 Tribal Development: Livelihood and Living Conditions

Tribal Development in the present study has been conceptualised in terms of livelihood and living conditions of rural households. They are discussed in terms of Pattern of tribal livelihood, Patterns of Living Conditions, Patterns of Relationship between Livelihood and Living Conditions, Patterns of Relationship between Agrarian Transformation and Tribal Development.

The physical capital, financial capital and social Capital are analysed to understand the pattern of tribal livelihood. In the physical capital the housing amenities such as ownership of house, housing plot with LSC, ration card, electricity, phone, toilet, gas connection, water connection, two wheelers, three wheelers and four wheelers are analysed. Household owning a house and housing plot with LSC are more among the settled cultivator than the shifting cultivators which clearly shows that land ownership is associated with possession of wealth. Almost all amenities identified among the settled agriculturalists are better than the amenities of the shifting cultivators. All these amenities requires capital which in turn indicate that the settled agriculturalists have more capital and economically stable. In case of Water Connection the selected shifting cultivators village does not have water connection and they have a spring well for their household needs.

The financial Capital of the tribal in Mizoram is presented into household saving and household debts. Capital formation in agriculture in the present study occurs both at the household level and at a macro level. The reason for the lack of land use change to more productive states was lack of capital and labour. The mean financial capital is comparatively higher among the settled agriculturalists as compared to shifting cultivators. Four ways of household saving are observed such as in cash, saving in banks, saving in post office and saving in self help group among the tribal household in

Mizoram. Most of the saving is done through a commercial bank and savings through a banking institution arises especially among the settled agriculturalists and keeping cash at hand is also comparatively more than the shifting cultivators. The present study saw upward movement and observed the activity of saving which starts in the process of agrarian transformation in Mizoram.

The social capital of the sample households is measured in terms of community participation and political participation. Community participation in the present study is defined as participation in different civil society organisations. Religion always occupies the centrality of tribal social life and the participation in church is the highest. YMA who have the largest members in Mizoram have the participation next to religion which is almost the same. Community Participation is significantly higher among the settled agriculturalists as compared to the Shifting Cultivators which clearly indicated that wealth is a source of power and economy effects the social participation.

Voting and involvement in election campaign are the main ways of political participation for the farmers in Mizoram. Participation as a leader is mainly at the level of Village Council and in political party. Participation is the highest in village council election and it is almost the same in assembly election. The Political Participation is slightly higher among the settled agriculturalists as compared to the shifting cultivators and there is no much difference among them.

Income and expenditure of households are analysed to understand the pattern of living conditions of the tribal Mizoram. Household Income indicates the standard of living of the family. The sources of annual household income are mainly from crop husbandry, labour, business, animal husbandry and government service. The average Annual Household Income is significantly higher among the settled agriculturalists as compared to the shifting cultivators. Among all the sources the main concentration of

Annual Household Income is from Crop Husbandry as farmers are mostly selected as samples. Surprisingly labour contributed as the second highest position followed by Business, Animal husbandry, Government Service and Other Sources which includes assistance from government and irregular income of families. The settled agriculturalists have a higher income than the shifting cultivators in all these sources. Another disturbing finding is that the income diversity index shows that the income among the shifting cultivators is more diversified than the settled agriculturalists. The process of agrarian transformation from shifting cultivation to settled cultivation influenced the farmers to concentrate on lesser occupation with more amount of capital.

The pattern of household expenditure is the second indicator of the standard of living of the tribal households studied. The monthly household expenditure of the respondent households was observed in terms of a number of items viz., food, donations, transport, medication, clothing, phone, electricity and water. The Per capita Monthly Household Expenditure and monthly household expenditure is significantly higher among the settled agriculturalists as compared to shifting cultivators. Similar result was reported by Chawngthu and Kanagaraj (2013) in the context of Mizoram.

Most of the monthly household expenditure was incurred on non-food while less than one third of that was incurred on food. On the whole, the pattern of monthly household expenditure is concentrated mainly on food and donation in the church and NGOs is also relatively high which shows that the participation in community requires more expenditure to do so, which is followed by expenditure on Transport, Medication, Clothing, Phone, Electricity and Water. The expenditure on water is comparatively low among the shifting cultivators as many of them still depend on spring well and do not have water connection. This finding is contradictory to the pattern of household expenditure by Chawngthu and Kanagaraj. They have reported significant difference in

the pattern of household expenditure. The greater share of non-food expenditure was found among the shifting cultivators while food expenditure constituted the greatest share of household expenditure.

The pattern of relationship among them is discussed in this subsection. As expected a significant positive relationship was observed among the different forms of capital endowments of households viz., physical capital (housing amenities index), financial capital and social capital. Tribal living conditions constitute the second set of indicators of tribal development. The indicators of tribal living conditions are per capita income, income diversity index, and per capita monthly household expenditure. Contrary to the expectation that livelihood diversification (income diversity index) has significant negative effect on the household income while having no significant effect on the household expenditure.

As expected most of the components of the tribal livelihood assets have significant positive effect on both the indicators of tribal living conditions viz., per capita income and per capita monthly household expenditure. Physical capital, financial capital, and social capital have positive effect on per capita income and per capita monthly household expenditure. Physical capital (housing and amenities) has significant positive effect on per capita income, per capita monthly household expenditure. Likewise, financial capital and one of its components per capita household saving have significant positive effect on per capita household income and per capita household expenditure. However, per capita household debt does not have significant relationship with household income or per capita household expenditure. Community participation does not have any significant effect on the household living condition indicators viz., per capita income, and per capita monthly expenditure. On the other hand another indicator of social capital,

political participation has significant positive effect on per capita income and monthly expenditure.

However, on the livelihood diversification only physical capital and social capital have significant negative effect. The housing amenities index, community participation have significant negative effect on the per capita income and expenditure. On the other hand financial capital does not have any effect on the income diversification of the household.

9.1.4 Agrarian Transformation and Tribal Development

The relationship between agrarian transformation and tribal development is analysed using Karl Pearson's coefficient of correlation. The agrarian transformation is discussed in terms of distance to headquarters, type of cultivation, number of plots, areas of land possessed, duration of land possessed, livestock value, gross cropped area, crop diversity index, and input use. On the other hand the tribal development indicators probed into the present study is discussed under housing amenities index, financial capital, per capita household saving, per capita household debt, community participation, political participation, per capita income, income diversity index, and per capita monthly household expenditure.

Distance to headquarter is significantly related with tribal livelihood and living condition. The households in the distant villages have significantly lesser physical and financial capital as compared to those who live in proximate villages. Their per capita income and financial capital are also lower among those households in distant villages as compared to those live in villages proximate to the district head quarters.

The type of cultivation is significantly related to tribal livelihood and living conditions. The settled cultivator households are having better livelihood in terms of housing amenities, and frequency participation in the community activity is also higher as

compared to the sifting cultivator households. The living condition of the settled cultivators is better in terms of per capita income and per capita household expenditure than those of the shifting cultivators. On the other hand there are no significant differences between the shifting and settled cultivators in financial capital.

The number of plot of land possessed by households has significant positive effect on tribal livelihood and living condition. As the number of plots possessed by the household increases the volume of physical, financial and social capital also increases. On the other hand, the number of plots of land possessed is not significantly related to per capita household saving, political participation, per capita income, and income diversity index even at 5 percent levels.

The area of land possessed is the second set of indicator of agrarian transformation. The area under LSC, Common land, total area of land possessed and size of land holding were analysed for their effect on tribal livelihood and living conditions. The area of land possessed and size of land holding have significant positive effects on the tribal livelihood and living conditions. The area of land possessed has significant positive effect on the various livelihood assets viz., physical capital (housing amenities index), financial capital, per capita household debt, social capital (community participation). It also positively impacts the living conditions of the households in terms of per capita income and expenditure. Area of land possessed under LSC has significant positive effect on livelihood and living conditions while area of land possessed under common land has negative effect. Area of land under LSC has positive effect on physical, financial and social capital. It similarly impacts the living conditions of the households in terms of household income and expenditure. The area under common land has negative effect on physical capital while having no such effect on financial or social capital

endowments of the households. Yet it has significant negative effect on both the indicators of living conditions viz., per capita income and expenditure.

On the contrary to expectation, livestock value does not have any significant effect on the livelihood assets viz., physical, financial, and social capital. But it has significant positive effect on one of the indicators of living conditions viz., per capita monthly expenditure.

Two indicators of cropping viz., gross cropped area and crop diversity index were analysed for their effects on the tribal livelihood and living conditions. The gross cropped area has significant positive effect on tribal livelihood and living condition. The household with greater cropped area have better livelihood in terms of housing amenities, financial capital, per capita household debt, community participation and living conditions in terms of per capita household expenditure. However, it has significant negative effect on the income diversity index. The household with diversified crop usually shifting cultivators have lesser diversified income and lesser political participation. On the other hand crop diversity index is not significantly related to housing amenities index, financial capital, per capita household saving, per capita household debt, community participation, per capita income, and per capita monthly household expenditure.

The effect of input use on the tribal livelihood and living conditions has been analysed in terms of the frequency of use of local seeds, use of HY Seeds, use of organic manure, chemical fertilizers (NPK) and chemical fertilizers (Minor).

Although household with greater use of local seed have lesser per capita income and housing amenities, the household expenditure decrease and this in turn resulted in increase in household saving. On the other hand financial capital, per capita household

debt, community participation, political participation, and income diversity index are not significantly related with use of local seed even at 5 percent level.

The increased use of HYV seeds, the household's physical capital and living condition (household expenditure) also increases. On the other hand the financial capital, per capita household saving, per capita household debt, community participation, political participation, per capita income, and income diversity index are not significant even at 5 percent level.

Interestingly, household using greater organic manure has greater physical capital (housing amenities), financial capital, social capital, per capita income, diversified income. The households have more expenditure and debt when they use more input in terms of use of organic manure. On the other hand per capita household saving and political participation are not significantly related to use of organic manure even at 5 percent level. Household with greater financial capital use more minor and major chemical fertilizer and in return the household expenditure and household debt, household per capita income and household per capita income also increases.

9.1.5 Agrarian Challenges and New land Use Policy

The nature of problems faced by the farmers in Mizoram and how the New Land Use Policy implemented by the government helps the farmer to cope with the existing problems is contained in this chapter.

Many challenges are faced by agriculturists due to land and water scarcity and pressure on natural resources. The difficulties and problems in shifting cultivation as perceived by the farmers are rated by the respondents.

Inadequate funds and capital crippled the farmers to grow and increase production. Moreover the funds received through New Land Used Policy and other programmes for farmers are not enough and the supply of material assistance and

seedlings are also not in time and the quality is not good which create lots of problem for the farmers in Mizoram.

Although land is always available from common land for *Jhum* cultivation, the shifting cultivators sometimes faced non suitability of land for cultivation when there is a tendency to switch over to settled agriculture. Majority farmers do not see it as a problem as the implementation of NLUP helps the farmer to acquire land through the revenue department which is easier than before.

Inadequate availability of subsidised organic manure, chemical fertilizer and chemical pesticide also has effects on the number of product. The land especially settled cultivation needs more preparation and protection from insects. The unavailability at cheaper rate and unavailability of continuous supply discourage the farmers to depend on them. A very disturbed finding is that the shifting cultivators sensed inadequate supply of chemical fertilizers and pesticides higher than the settled agriculturalists as a problem which might be because the shifting cultivators started moving towards settlement and the land needs more input in terms of fertilizers.

Mostly the cultivated lands are not connected with electricity which makes the irrigation system not possible and the use of certain machinery to upgrade farming technique is also not possible without power. Lack of irrigation facilities is faced because of the dependency on rain alone which makes irrigation facilities almost absent in Mizoram. Use of machine and agro based industries for farmers are not possible because of the absence of electric supply in cultivated land of Mizoram. Lack of adequate infrastructure and economic incentives has contributed to the agrarian stagnation. The farmers in Mizoram always face problems because of lack of agro based industries and do not have the place for processing of their products for market the farmer loss many of their products especially fruits and vegetables. Surprisingly the shifting cultivators also

experience the lack of agro based industries which shows that commercialisation have started among the cultivators.

Poor roads and Lack of transport services affected the marketing system the access of the farmers to technology and training. Low transport facility can distort the allocation of resources across geographically dispersed production units and would reduce their income. Moreover the value of products decreases because of the high cost of transport.

Lack of Information on Market and Lack of technical knowhow is not a very big problem for the farmers as most of them have experience on farming and marketing is still somehow sufficient within the local market for certain crops especially fruits and vegetables. The settled agriculturalists received a better training on agriculture and awareness on marketing. The shifting cultivator accepts and rated the lack of market facilities as a problem higher than the settled agriculturalists as most of the crops produced are for consumption and marketing is less among the shifting cultivators. The market facilities especially the global and national level market is not accessible for the small farmers. Even the local market is still not systematically operated and it is completely unorganised. But the local market till today insufficiently served the small farmers. Non remunerative price can be the effect of multiple problems such as lack of marketing facilities, lack of transport facilities and low quality of products. The prices of products especially fruits and vegetables are not stable and there is no proper rate that is fixed. The farmers are bargained by local buyers and contract farmers from outside where they are forced to sell their product by force as the farmer do not have other choice.

Inadequate human labours are available any time of the year. The key informant interview and survey also indicated that landless labour class start to exist in Mizoram. Inadequate animal labour is not rated as a problem by farmers because the use of animal

is absent. Inadequate animal labour is one of the problems faced by the cultivators and the tendency to utilize animal labour arises among the settled agriculture.

In response to the environmental degradation and to stop Jhum cultivation the government of Mizoram introduced alternative policy called the New Land Use Policy (NLUP) to put an end to the practices of shifting cultivation by giving the farmers alternative sustainable land based occupation.

New Land Used Policy of the Mizoram Government is benefitted by most of the sample households. The trades selected by the shifting cultivators are mostly agriculture related trade such as orange, rubber, broom, pineapple, oil palm, sericulture, coffee, wet rice cultivation, areca nut and tea which proves the transition towards settled agriculture. There are also few households selecting non agriculture trade such as automobiles, carpentry, petty shop and tailoring. Shifting cultivators selects orange and even oil palm is also selected as a trade. The settled agriculturalists selects trade mainly which requires more capital and commercial oriented. Although the trade selected by the shifting cultivators are under agriculture many household do not materialize as expected under.

Most of the assistance from NLUP is received by the sample household between the year 2008 and 2014. Majority receive the assistance in the year 2013 where the impact on household income will still be early to be analysed. Assistance under NLUP is mainly in the form of financial assistance, subsidised equipments and subsidised seeds. Financial assistance contributes the main assistance under NLUP which is also given on instalment. Subsidised equipment and tools is given but the rate of assistance is low and some trade do not need equipment and tools.

Assistance under NLUP are mainly used for plantation, preparation, and buying. Majority beneficiaries used assistance for plantation and land preparation especially among the settled cultivators. Few household used the assistance for buying tools and

there are some household who use the assistance on other purposes which is against the rules and regulations. The reasons of not receiving assistance are mainly favouritism based on political party, no proper selection criteria, and not accepted by self. Among the household who are not beneficiary, majority of them see favouritism based on political party as the main reason of not receiving. Some felt that there is no selection criteria which is clear from the fact that some household reject after receiving the assistance thinking that they are not eligible to receive. Among the non beneficiaries majority of the household do not expect to receive assistance under NLUP in the future as they believed that there is no proper criteria for selection of beneficiaries.

The impacts of NLUP on beneficiaries are rated with four point scale such as agreed, strongly agreed, disagreed and strongly disagreed. The sample households disagreed that NLUP will confer land rights as most of the land allotted are under Periodic Land Pass. But the shifting cultivators perceive that land under PLP is also a form of permanent cultivation although land rights are not given. The trades mainly selected are under agriculture and do not contribute to the family income immediately and saving as well. Moreover it does not increase employment opportunities. The shifting cultivators although have more positive mindset toward the impact of NLUP than the settled cultivators. Although assistance are received the expenditure on agriculture does not increased. NLUP do not motivate the farmer to work harder but the farmer rather see it as easy money making which is against hard work. Most of the trainings under NLUP were not effective as the knowledge and skills of the cultivators are not improved. Most of the trades were not supported with enough training and the place of training is mainly in district capital and block headquarters which is not accessible for the farmers in the remote areas. Trainings are also not benefited by the farmers as the quality of some of the training are not and do not help the farmers.

It is very sad to point out these perceptions towards NLUP which are all negative from the beneficiaries itself. As it is the flagship programme of the congress government it is highly politicised in many areas.

9.1.6 Social Dynamics of Agrarian Transformation and Development

The families from the sample villages are purposively chosen to represent the agrarian community to provide qualitative understanding on the social dynamics of switchover from shifting to settled agriculture and its impact on tribal development.

All the six cases studied highlight process of the agrarian transformation from shifting cultivation towards settled agriculture. In the perception of the farmers, the main reason for switch over from shifting cultivation to settled agriculture is the expectation that the transformation would enhance their livelihood though increasing agricultural production and productivity. The new land use policy of the government of Mizoram with support from the central government has also provided necessary support. The transformation brings commercialisation in cropping pattern and in the mean time cropping for domestic consumption has not stopped completely. In the process of transformation most of the case reveals that the trainings and techniques of farming given by the government are not effective for majority of farmers especially among rural farmers. The trainings provided were also not applicable for the farmers and sometimes it includes other languages other than regional language which are hard to understand for the farmers. The farmer sometimes felt that the information given in trainings is not reliable because even the strategy emphasised by the government also changes within a very short time and the farmers were forced to change the system within no time which requires lots of capital and waste the time of farmers. Moreover, the supplies of seedlings were not reliable and sometimes the qualities are very low. The supply of manures and pesticides are almost absent and the farmers have to buy it themselves which is possible

to farmers who are financially capable. Moreover it is not available in rural areas. Some of the cases have practiced settled agriculture long time ago but the household are not economically developed. This gave rise to a series of question like; ‘will the development of household economy caused by agriculture transformation be sustainable in the future?’ This assumption arises in the process of case study because most of the farmers do not select their own crop to be cultivated but were instigated by the different government department who has interest only in their areas and project. So without any study on the condition and status of the farmers they just introduce the crop under their project. There is no security on the side of the farmers on crop failure and natural calamities as no insurance is given to farmers. The farmer without choice has to cultivate as the government proposed for want of assistance from the government. Oil Palm cultivation emerged which is a new phenomenon in the southern areas of Mizoram. With this contract farmer emerged as Ruchi Soya Company writes Memorandum of Understanding with the government. The company provides seedlings, training and will buy the products at the price fixed by the board. The use of machinery also started which will help the farmer to cultivate more land with lesser amount of expenditure and time.

Cultivation of cash crop such as Ginger, Chili and Tobacco etc. in a Jhum land is a new trend that emerges in the process of transformation of agriculture influenced by commercialisation of settled agriculture. The main problems faced are not different from the quantitative data in the present study such as lack of irrigation, lack of market facility, no crop insurance, less supply of manure and pesticides etc. The cultivators have no other choice for their livelihoods except farming which held the government responsible for the development of the cultivators.

9.2 Conclusion

The present study probed into the nature and dynamics of agrarian transformation from shifting cultivation to settled agriculture and its bearing on the livelihood and living conditions of people in the context of tribal economy and society of Mizoram. This process of transformation has been accelerated by the successive governments of Mizoram with the financial support from the governments of India for the last three decades. Yet the transformation from shifting cultivation to settled agriculture has to be accomplished. The tribal people have lost hope with their traditional system of livelihood and have faith in modern settled agriculture. Yet there are number of topographical, financial, technical and infrastructural constraints that prevent them from becoming settled cultivators. The transition has resulted in changes in the nature of land possession, size of land holding, livestock ownership, cropping pattern, input use and perception of ecological consequences of the shifting cultivation. This transformation has improved the livelihood and living condition. However, this has not resulted in markedly higher level of income and savings among the settled cultivators. Further, the inequality in the land distribution has increased. In the agrarian structure embourgeoisement is happening though land alienation is not happening. This process of transformation is also accompanied by commercialization and market integration of the cultivation. Whether these will sustain the livelihood and living conditions of the tribal cultivator households or not? Future studies will answer this question.

9.3. Suggestions

The following suggestions for policy advocacy emerge from the present study.

- 1. Policy on Land Ceiling and Transfer:** The results of the present study show the increase in inequality in the land distribution. Hence, there is a need for legislation on land ceiling and transfer in Mizoram. It is desirable that inter district land transfers may be prevented for at least two decades so as to prevent land alienation and proletarianisation.
- 2. Rural Infrastructure Development:** Lack of physical infrastructure constitutes a major constraint to agricultural development in the context of Mizoram. Better roads, transport, communication, information and markets need to be provided to the rural areas of Mizoram.
- 3. Rainwater Harvesting:** Inadequate irrigation facilities during the off season are also a major constraint to agricultural and social development in Mizoram. The states Hilly topography constitutes a major challenge to its irrigation development. Efforts may be made to explore to harvest rainwater at farm and village levels.
- 4. Revision of NLUP:** The present NLUP and its implementation process need to be revised based on participatory consultation with people at village level. Crop selection need to be based on local needs, available resources and preferences over the external agencies' interests. Planning and policy making need to be based on local surveys and studies with local experts rather than those from international agencies.
- 5. Promotion of Livestock Rearing:** Livestock rearing contributes to livelihood diversification and higher income to the rural households in the context of

Mizoram. This also would enhance agricultural production and productivity also. Hence, efforts need to be made to promote local varieties of cow, pig, and poultry.

- 6. Promotion of Natural and Organic Farming:** Mizoram's climate is suitable for cultivation of vegetables, fruits, flowers and cereals. Production of these in natural organic mode will enhance its marketability and income of the farmers.
- 7. Need Based Agricultural Training Programmes in Mizo:** The farmers need to be given training on methods and techniques of cultivation, food processing, and marketing by the experts in their own language. In case the expert does not know Mizo, every effort need to arrange for a good translator.
- 8. Promotion of Saving and Financial Inclusion:** Saving and thrift are still unknown to many rural households in Mizoram. Promotion of saving and financial inclusion will contribute to the social and economic development of the rural masses. The state and civil society organisations need to organize awareness programmes to promote saving and thrift among the people.
- 9. Implementation of Crop Insurance:** Crop failures and losses affect the cultivators in Mizoram as elsewhere. Hence, cheap crop insurance schemes need to be implemented in the state. This will save the farmers from uncertainty and risk.

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**Shifting Cultivation to Settled Agriculture:
Agrarian Transformation and Tribal Development in Mizoram**

Research Scholar
Mr. C. Lalenzama
PhD Scholar
Department of Social Work
Mizoram University

Research Supervisor
Prof. Kanagaraj Easwaran
Professor
Department of Social Work
Mizoram University

HOUSEHOLD INTERVIEW SCHEDULE
(Confidential and for research purpose only)

I. Respondent Profile

1	Identification Information	
	Schedule No.:	Date of Interview
	Village:	District: Lunglei
2	Profile of Respondent	
	Name:	
	Tribe	Non-Mizo; 1. Mizo
	Sub-Tribe	Non-Mizo; 1 Lusei; 2 Paite; 3 Ralte; 4Hmar
	Religion	1 Christian; 2 Hindu; 3 Bhuddist 4 Others
	Denomination	1. Presbyterian; 2 Baptist 3 UPC(M); 4 UPC(NE); 5 Salvation Army; 6 Seventh Day; 7 Roman Catholic 7 Local Denomination
	Type of Family	0 Nuclear; 1 Joint
	Form of Family	1. Stable; 2. Broken; 3. Reconstituted
	Socio-economic Category	0 AAY; 1 BPL; 2 APL
	Type of Cultivation	1. Shifting Cultivation; 2. Semi-settled; 3 Settled Cultivation
	Experience in Cultivation(years):	

II. Kindly furnish the details of household particulars.

ID	Name	Age	Sex #	Education	Earners/ Dependent**	Relation*
1						
2						

** 0. Dependent 1. Earner *0. Head; 1. Wife; 2. Son; 3. Daughter; 4. Parents; 5. Others

0. Male; 1. Female

III. Please give us the details of the occupation of the earning members of your household

ID	Sex	Name of Occupation		Annual Income	
		#Primary	##Secondary	Primary	Secondary

IV. Facilities and Amenities

Sl.No	Items	No of Items
1.	Water connection	
2.	Electricity	
3.	Septic tank/ Pit Latrine	
4.	LP Gas	
5.	Land	
6.	Ration card	
7.	Phone/ Mobile	
8.	Two Wheeler	
9.	Four Wheeler	
10.	Housing	Owned/ Rented

V. Kindly furnish the details of average Monthly Expenditure of your household.

Sl.No	Items	Quantity	Amount in Rupees
1.	Food		
2.	Electricity		
3.	Water		
4.	Phone		
5.	Clothing		
6.	Transport		
7.	Medication		
8.	Religious and Cultural		
9.	Others (Specify)		

VI. Kindly furnish the details of Household Saving and Debt

Sl.No	From	Saving in Rupees	Debt in Rupees
1.	Cash In hand		
2.	Friend and relatives		
3.	Money Lenders		
4.	Commercial Banks		
5.	Post office		
6.	Life Insurance		
7.	Cooperatives/SHGs		
8.	Others (Specify)		

VII. How frequently family members are participating in the meeting of the following Associations.

Sl.No	Associations	Always	Mostly	Sometimes	Never
1.	YMA	3	2	1	0
2.	MUP	3	2	1	0
3.	MHIP	3	2	1	0
4.	Games and Sports	3	2	1	0
5.	Church	3	2	1	0
6.	Church based Youth Association	3	2	1	0
7.	SHGs	3	2	1	0
8.	Others(Specify)	3	2	1	0

VIII. How Many Adult members of your family voted in the recent elections?

Sl.No	Election	All	Most	Some	None
1.	General	3	2	1	0
2.	Assembly	3	2	1	0
3.	Village Council	3	2	1	0

IX. Your household's political affiliation belongs to which party.

Congress	MNF	MPC	ZNP	Others (specify)	0. No political Affiliation
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X. Details of Land Possessions/ Ownership

S.No	Type of title	No of Plots	Area(Tins)	Duration(Years)		Source
				Possession	Cultivation	
1	Land Settlement Certificate					
2	Periodic Land Pass					
3	Temporary Pass(VC)					
4	Common Land					

XI Have you ever transferred/lost land to someone else. If yes Kindly give details

Year	Area (Tins)	Agency(To whom)	Mode	Amount in Rupees	Purpose
			Lease/Sale/Mortgage		
			Lease/Sale/Mortgage		

XII. Please give the details of livestock owned by your family.

S.No	Livestock	Number	Current Value	Annual Income
1	Pig			
2	Goat/Sheep			
3	Poultry Birds			
4	Cow			
5	Fish			
6	Horse			
7	Other (Specify)			

XIII. Kindly furnish the details of crops cultivated by you during the current year.

S.No	Crop	Number of Times	Area (Tins)	Annual Income	Primary Purpose(√)	
					Household	Market
1.						
2.						

XIV. Kindly furnish the details of the tools used by you for Cultivation and harvesting.

Sl.No	Tools	Number	Source
1.	Chempui (Dao)		
2.	Hreipui (Axe)		
3.	Chem Sei (Big Dao)		
4.	Thirtieng (Crowbar)		
5.	Suahdur (Spade)		
6.	Chemkawm (Invented)		
7.	Tuthlawh (Traditional)		
8.	Dawrawn (Bamboo Basket)		
9.	Em (Basket)		
10.	Favah(Sickle)		
11.	Empai (Bamboo Basket)		
12.	Paikawng (Basket)		
13.	Tlam Em (Bamboo Basket)		
14.	Diesel Pump Set		
15.	Electric Motor Pump Set		
16.	Power tiller		
17.	Tractor		
18.	Mechanical Weeder		
19.	Drip irrigation		
20.	Sprinkler irrigation		
21.	Others(Specify)		

XV. How frequently are you using the following inputs in cultivation? (√)

Sl.No	Input	Frequency of Use			
		Always	Mostly	Sometimes	Never
1	Seed				
	Local	3	2	1	0
	HYV	3	2	1	0
2	Human Labour				
	Hired Labour(Male)	3	2	1	0
	Hired Labour (Female)	3	2	1	0
	Family Labour (Male)	3	2	1	0
	Family Labour (Female)	3	2	1	0

3	Animal Labour				
	Own(Specify)	3	2	1	0
	Hired(Specify)	3	2	1	0
4	Machinery				
	Own(Specify)	3	2	1	0
	Hired(Specify)	3	2	1	0
5	Fertilizer				
	Organic Manure(Specify)	3	2	1	0
	Chemical Fertilizers(NPK)	3	2	1	0
	Chemical Fertilizers(Minor)	3	2	1	0
6	Pesticide				
	Organic Pesticides (Specify)	3	2	1	0
	Chemical Pesticides (Specify)	3	2	1	0
7	Irrigation				
	Seasonal Rain Fall	3	2	1	0
	Rain Water Harvesting(Specify)	3	2	1	0
	River/Stream Water	3	2	1	0

XVI. Have you encountered the following problems due to shifting cultivation in your area? (√)

Sl.No	Ecological Consequence	Strongly Agree	Agree	Disagree	Strongly Disagree
1	Soil Erosion, loss of top soil	4	3	2	1
2	Loss of Forest and destruction of trees	4	3	2	1
3	Fire accidents due to Jhum fire	4	3	2	1
4	Water retention capacity of soil is reduced	4	3	2	1
5	Reduces rainfall	4	3	2	1
6	Loss of wild animals, birds and insects	4	3	2	1
7	Reduction of water flow in the river/stream	4	3	2	1
8	Others(Specify)				

XVII. Did your family benefit from NLUP of Government of Mizoram?

Yes	1	0	No
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XVII a. If yes what was the trade and when were you selected?

b. If yes how did NLUP support your family?

Sl.	Kinds of Support	Month and Year	Amount	How did you utilize the support?
1.	Subsidy (Finance)			
2.	Equipment/ Tools			
3.	Manure (specify)			
4.	Seeds			
5.	Others			

c. If no. why you were not selected?

XVII d. If no. are you expecting that you will also be selected?

e. If you expect you will be selected when will you be selected?

XVIII. How did NLUP affected your life, livelihood and living conditions?

SI.No		Strongly Agree	Agree	Disagree	Strongly Disagree
1	Conferred Land Rights on men				
2	Conferred Land Rights on women				
3	Settled your family in Permanent Land				
4	Increased your household wealth				
5	Increased your household Income				
6	Increased your employment opportunities				
7	It made you to work harder for more hours.				
8	Increases your household expenditure				
9	Increases your households saving				
10	Increases agricultural production				
11	Increased the market opportunities				
12	Increased knowledge on modern agricultural practices				
13	Increased skills in modern agricultural practices				
14	Others(Specify)				

XIX. Kindly rate the difficulties faced in agriculture.

SI.No	Constraint	Always	Mostly	Sometimes	Never
1	Inadequate funds	3	2	1	0
2	Non suitability of land for cultivation	3	2	1	0
3	Lack of Irrigation facilities or sources	3	2	1	0
4	Lack of technical knowhow to practice	3	2	1	0
5	Inadequate human labour	3	2	1	0
6	Inadequate animal labour	3	2	1	0
7	Lack of marketing facilities	3	2	1	0
8	Non remunerative price	3	2	1	0
9	Lack of transport services	3	2	1	0
10	Poor roads	3	2	1	0
11	Lack of Information on Market	3	2	1	0
12	Inadequate electricity supply	3	2	1	0
13	Inadequate supply of chemical fertilizer	3	2	1	0
14	Inadequate supply of chemical pesticide	3	2	1	0
15	Inadequate availability of organic manure	3	2	1	0
16	Lack of storage facilities	3	2	1	0
17	Lack of agro based industries	3	2	1	0

XX. Suggestion to improve agriculture in Mizoram.

SI.No	Suggestion	
1.		
2.		

**Shifting Cultivation to Settled Agriculture:
Agrarian Transformation and Tribal Development in Mizoram**

Research Scholar
Mr. C. Lalengzama
PhD Scholar
Department of Social Work
Mizoram University

Research Supervisor
Prof. Kanagaraj Easwaran
Professor
Department of Social Work
Mizoram University

VILLAGE SCHEDULE
(Confidential and for research purpose only)

I.	Identification Information							
	Schedule No.:	Date of Interview:						
	Village:	District: Lunglei						
II.	Profile of Village							
	Name of Respondent							
	No of Population	Male	Female			Total		
	No of Households	BPL		APL		AAY		
	Denomination wise Distribution of Households	Presbyterian	Baptist	Roman Catholic	Salvation	UPC(NE)	UPC(Mz)	Others
	No of households							
	No of church							
	No of Schools	Primary :		Middle:	HS:	HSS:	Others:	
	Government							
	Private							
	No of Aganwadis							
	No of PHC/Sub-Centres							
	No of SHGs							
	No of Water Connections							
	No of Electric Connections							
	No of Households with Septic Tank							
	No of Household with pit latrine							
III	Type of Cultivation							
	Shifting Cultivator							
	Settled Cultivator							
	Both							
IV	Community Based Organisations	Members		Year of Establishment		Main role in Community		
	YMA							
	MHIP							
	MUP							
	Others (Specify)							
V	Beneficiaries of NLUP	No of Households		No of households Under Farming				
	1 st Phase							

	2 nd Phase				
	3 rd Phase				
VI	Rate the quality of Road linkage to your village	Very Good	Good	Bad	Very Bad
VII	Mention the Transport facility availability to your village	Bus Services	Sumo	Public Carrier	Two/Three Wheeler
		A zat:	A zat:	A zat:	A zat:
VIII	Mention any NGO working/ Functioning in the village				
IX					

Mode of Selection of NLUP beneficiaries

Sl.No	Mode of Selection	Strongly not agreed	Strongly not agreed	Agreed	Strongly Agreed
1	Selection made by the Congress Party	1	2	3	4
2	Selection made by the Village Council	1	2	3	4
3	Selection made by YMA	1	2	3	4
4	Selection made by Govt. Officials	1	2	3	4

Criteria of Selection

Sl.No	Criteria of Selection	Strongly not agreed	Strongly not agreed	Agreed	Strongly Agreed
1	Households belonging to Below Poverty Line	1	2	3	4
2	Belonging to a Congress party	1	2	3	4
3	Belonging to a particular Church denomination	1	2	3	4
4	Unemployed	1	2	3	4
5	Relative of the selector	1	2	3	4

Mention different Trade selection made by your village

Sl.No	Types of Trade Selected by the villagers
1	
2	
3	
4	
5	
6	