NEW LAND USE POLICY AND RURAL DEVELOPMENT IN MIZORAM

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SUBMITTED
IN PARTIAL FULFILMENT OF THE
REQUIREMENT OF THE DEGREE OF
MASTER OF PHILOSOPHY IN GEOGRAPHY
OF NORTH–EASTERN HILL UNIVERSITY, SHILLONG

DEPARTMENT OF GEOGRAPHY
SCHOOL OF HUMAN AND ENVIRONMENTAL SCIENCES
NORTH EASTERN HILL UNIVERSITY
SHILLONG
2000

NORTH-EASTERN HILL UNIVERSITY

November. 2000

I, R. Zoramchhuana, 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 my 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.

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ACKNOWLEDGEMENTS

I express my deep sense of gratitude to Dr, Surendra Singh. Reader in Geography Department. North-Eastern Hill University. Shillong for his guidance. constant encouragement and inspiration throughout the course of present research work.

I am indeed grateful to Prof. A.C. Mohapatra, Head, Department of Geography for his encouragement to complete this work.

I would like to express my thanks to Dr. N.P. Goel, Statistician in Department of Geography for his help in getting the manuscript typed on computer and printed neatly.

My thanks are due to my fellow members of Mizo Research Scholar's Association (MRSA); Mr. Lalhmachuana: office staff in Geography Department; Mr. Jim Renthlei of Department of Physics; Ms. Lalhmachhuani, Department of Geography; Ms. R. Vanlalhruaii; Ms. Vanlalhruaii and Ms. R. Lalchhanhimi, Department of Philosophy for their encouragement and arranging data and cartographic works in an appropriate way.

I am also grateful to my parents, my sisters, my brothers and my cousin sister R. Zothanchhungi for their moral and financial support.

Lastly, but not the least, I am very much thankful to the Almighty God for giving me strength that enable me to complete this work.

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CHAPTER – I

INTRODUCTION

1.0 Introduction:

Development, by definition is an act or process of change in the socio-economic activities within the framework of available resources. The changes in human activities may be visualised over space which refer to 'development' and over time also which is called 'growth'. Therefore, development and growth are co-terminus and simultaneous processes of landscape. These two dimensions refer to a space-time relationship which are important to study for assessing changes occurring in socio-economic landscape of an area/region. In geographical perspective, these aspects of developments have been studied considering the geographical phenomena of such landscape. As a result, the process of change is integrated phenomena and the developmental aspects are the part of the study of the relationship between socio-economic attributes and geographical factors over space as well as over time.

So far as socio-economic attributes of an area and changes therein are concerned, these aspects are related to various factors, interactors and integration and even the spatial arrangements of activities. Various attributes of economy and social dimensions may be included in studying such aspects of development. However, the major economic sectors and social activities are included and studied by considering the geographical factors and resource-base of an area. In fact, the study of

development and change has a bigger integrated umbrella of activities like rural sectors of economy, urbanisation and industrial sectors, tertiarisation of the economy. These aspects are related to the level of existing economy and dominance of social activities in the area. For example, the growing number of towns in an area shows a change not only in the demographic and social structures of society but also shift in the occupational structure. Further, the developmental processes are also related to the creation of infrastructure. The state (i.e., an administrative area) intensifies its infrastructure for accelerating the changes in these activities. Such efforts have also been made in Mizoram especially for the development of rural economy. These aspects of development and growth may be interpreted here with special reference to Mizoram.

2.0 Bases of Rural Economy:

The different types of socio-economic landscape have the dominance of different systems of economy, e.g., if an area has underdeveloped economy, the primary sector has its dominance in rural economy. Contrary to it, the landscape of well-developed economy is based on secondary and tertiary activities of the development. In this context, it can be said that the economy of Mizoram is basically based on rural activities in which primary sector is dominated by Agriculture sector, Animal Husbandry and Cottage Industries. They form the nature of rural economy and are controlled by physiographic parameters and socio-cultural factors of the area. The integrated system of rural economy in Mizoram is also influenced by the infrastructure

like market facilities, road accessibilities, electricity and educational facilities (Fig – 1.1).

Keeping these aspects in mind, the entire economy of Mizoram can be characterised as primary in nature but progressing gradually with the help of such infrastructure facilities. In the pattern of rural economy of the state, three sectors are dominating.

(1) Agriculture and Allied sector (permanent cultivation, jhum practices, orchards, etc.),

(2) Animal Husbandry and Veterinary Sector, and

(3) The Cottage Industries related to the above sectors.

Therefore, the secondary and tertiary sectors of the economy are weak and most of the parts of working force is employed in primary sector which is interpreted above.

For the development of these three sectors of rural economy, Government has initiated some important programmes like IAY, DWCRA, JRY, IRDP, TRYSEM, NLUP, SDS, etc. Out of them, NLUP was initiated from late 80's and was completed till 1997-98. The effect of this policy has accelerated developmental processes bringing the changes in the above cited sectors of economy, which is now a question

of debate whether the policy was having a significant effect on the transformation or change in rural sector or it is failed because it was stopped suddenly in 1998.

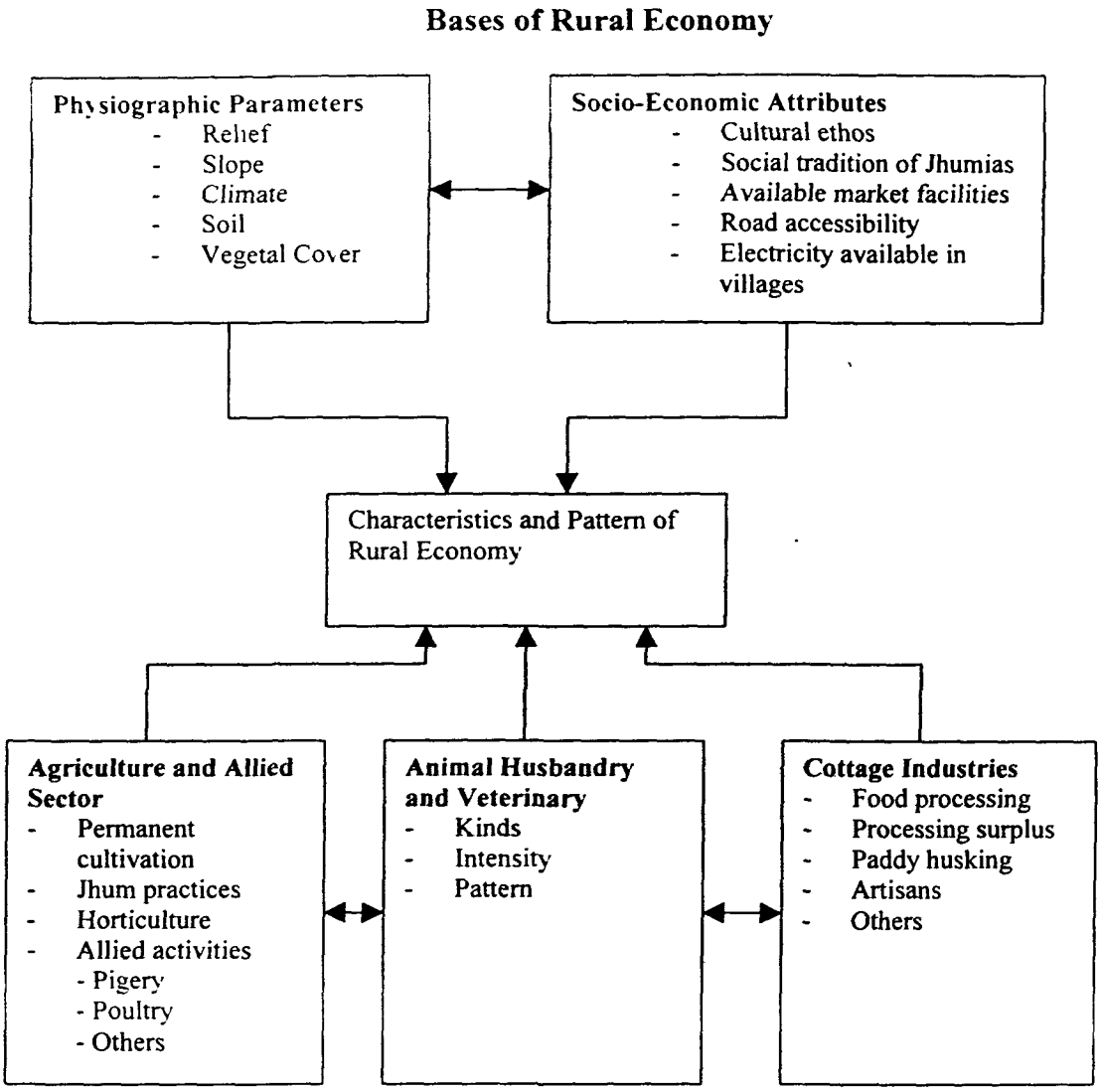


Fig. – 1.1: Interrelated Systems of Rural Economy.

3.0 Statement of Problem:

Though agriculture is the backbone of the economy of Mizoram (Mishra 1996) and most of the working population is engaged in agricultural activities. the agricultural products never meet the demand of the people. The agricultural land is

small in size, covers only about 6.15 percent to that total geographical area of the state (Government of Mizoram 1998). Paddy as a staple crop covers more than 52 percent to the total cultivated area in 1997-98. The paddy including jhum, wet rice and HYV paddy production is recorded 1.10.806 metric tonnes which is only 16.27 qu ha. In order to satisfy the needs of the people, the state government procured 50,000 metric tonnes of rice from outside Mizoram in 1992, which was raised to 1,00,106.6 MT in 1995 (Statistical Handbook of Mizoram 1996, pp. 104-105). Besides this staple crop (rice), there are many food crops, vegetable crops and fruit crops etc. But their yield per hectare are not significantly high in compare to other states and the whole nation.

Like most of the underdeveloped regions, the highest share of the working population of Mizoram (bout 65 percent) is engaged in agricultural activities according to 1991 census statistics. On account of dominance of primary sector, most of the part of population is living in rural areas. However, urbanisation has also been taken place because of migration and weak links of rural economy in the state. There is no option of suitable alternative trades to replace agricultural activities and, therefore, labour intensity is increasing in agriculture.

Among the agricultural system in the state, Jhum or shifting cultivation is very common (Das 1990, Singh 1991, Ray 1993, Lianzela 1994, Lalrimawia 1995). It is an old traditional mode of farming in Mizoram and is still practised in rural areas. In 1981, this method of cultivation covered an area of 65,000 ha, which has been reduced

to 39,175 ha during the 1980s. On account of increasing population pressure, it has been expanded to 46,691 ha in 1997 (Government of Mizoram 1991, 1997)

Jhum cultivation is less productive than permanent cultivation. It is not suitable ecologically in the hill areas of NE (ICAR 1983). The adverse effects of jhum cultivation can be seen of forests, wild life and landuse. The changes in eliminate is also related to expanded jhum practices. Being fluctuation in rainfall in the state, the production and yield of paddy is reduced in 1981. The state experienced such problems and the total loss was estimated as 27,347 metric tonnes of rice which equivalents to Rs. 8.20 crores in terms of money (Lalhniangi 1990, p.83).

On account of those crucial problems faced by the jhumias and jhum cultivation, the state Government tried to take action against the practice of jhumming. The control of jhum cultivation is the key to the economic development problems of the hill areas of North East India (Saha 1973, p.103). In 1984, the New Land Use Policy (NLUP) had been performed to replace the jhum cultivation. Before the NLUP, there was another jhum control programme but it could not be succeeded in the state. Out of 10,000 families in Mizoram who joined the programme, only 300 families gave up jhumming (ICAR 1983, p. 31). The NLUP was eliminated in 1987. In 1989, the NLUP was revived and the Rural Development Department was entrusted for the implementation of this programme from 1990 to 1991. Rural Development Department is the best suited department to take up this programme, transfer of people

out of low productivity agriculture and related activities into more rewarding pursuits is one of the most important strategies for Rural Development (Samanta 1989, p 23)

As this scheme was launched to minimise the jhum cultivation, jhumia families who were not having any alternatives of livelihood were the target group (Project Report of NLUP 1991, 1997). For the implementation of this programme, the Government provided various options of trades to the jhumias which can be classified under three Sectors, namely-

1. Agriculture and Allied Sector comprising 28 main trades and 5 subsidiary trades.
2. Animal Husbandry and Veterinary Sector comprising 8 main trades and 2 subsidiary trades.
3. Industry Sector comprising 15 main trades and 3 subsidiary trades.

This scheme was again expended in 1998, and Rs. 16,768 lakhs was spent during the period of 8 years from 1990 to 1998.

4.0 Review of Recent Literature:

There has been a few works available on Mizoram especially regarding the NLUP and its related subjects which are Rural Development and Shifting Cultivation. Tripathi (1981) emphasised the importance of Rural Development and quoted the meaning of Rural Development coined by the World Bank:

"It is a strategy to improve the economic and social life of a specific group of people-the rural poor. It involves extending the benefits of development to the poorest among those who seek a livelihood in the rural area. The group includes small scale farmers, tenants and the landless "

Lianzela (1994) analysed the pace of economic development of Mizoram in detail, and concluded his work in book form with many important suggestions for the economic development of the state. Das (1990) dealt with the practice of Shifting cultivation in Mizoram from the beginning of the 20th Century to 1980s. Husain (1996) mentioned the ill effects of shifting cultivation. He suggests "Measures should be taken to see that jhumias are trained in other types of occupations. They should be given training in raising trees, orchards and plant protection, cottage and small industries, and indigenous handicrafts. Moreover, they should be trained in the development of dairy keeping, agriculture etc. For the effective implementation of these programmes extension service, co-operation and market facilities are essential". Agarwal (1988) also said that soil loss and reduction of organic matter due to the practice of shifting cultivation create serious economic problems for hill tribes.

Though Shifting cultivation has been contended as unproductive and destructive way of living, some writers have different idea upon the shifting cultivation. In the hilly areas where communication is neither developed nor sufficient, land suitable for terracing is not available jhuming alone can be done (Agarwal 1998).

Shifting cultivation is the natural way of life of some people - the natural source of carrying their livelihood (Bhowmik 1980). Due to the various disadvantages of shifting cultivation, the Mizoram Government had tried to replace it by a better means of livelihood, and the NLUP has been evolved in 1984 (Project Report of NLUP 1991).

Project Report of NLUP (1991, 1997) and a pamphlet 'New Land Use Policy' (1991) issued by the state Government mention the nature and plan outlays for the implementation of the scheme. Under this scheme, large number of families are offered many trades in a way to discard jhum practices (Pachuau 1994). This scheme was initially programmed to cover all the 20 Rural Development Blocks within the 8th Five Year Plan period (1992-1997). However, due to financial constraints, the programme have to be stretched to cover all the R.D. Blocks by the 9th Five Year Plan period (Project Report of NLUP 1997, p. 4). But the scheme was eliminated in 1998.

Some scholars found that the NLUP has many weak points, Grassroots Options (March/April 1999) unfold the disadvantages of NLUP, as quoted the statement of Tlanglawma, Professor in the Department of Economics, NEHU, Aizawl Campus. He referred, "Before, I used to be shocked to see a programme on National TV from Delhi which showed NLUP as a 100 percent success". He said that the NLUP is used more as political largesse than development doses.

The Director of Forest Education. New Forest, Dehradun (U.P.) examined the impact assessment of NLUP in Mizoram. He said, "it has, however, been observed that the programme failed to bring out any perceptible improvement in the economic condition of the villagers. There has not been any significant change in the quality of life of the beneficiaries as a result of NLUP and none of the stated objectives has been achieved" (Garbyal 1999, p. 142). He made many suggestions about the scheme.

Keeping these aspects of review of literature available on NLUP and jhum cultivation in landuse practices in Mizoram, it is obvious to say that there are various positive as well as negative impact of NLUP. In fact, jhum practice is primitive in nature and is closely related to the livelihood for rural masses. The entire socio-economic set-up of jhumias is based on and governed by the jhum activities. Therefore, it cannot be eliminated from the state. But it can be changed and modernised in a new perspective of rural development considering the specific set up of geographic frame where NLUP is implemented. Therefore, a impact assessment of NLUP in its integrated impact on rural development may be studied.

5.0 Objectives:

The present research attempts to study the role of NLUP in the development of rural areas in Mizoram. For this purpose, it aims to address the following objectives as:

1. to study the geographical personality of the state,

2. to describe the Land Use patterns and their allied rural sectors for evaluating the impact of NLUP on the changes of rural economy, and
3. to correlate and compare the change of economic sectors with the change of beneficiaries of NLUP.

6.0 Research Questions:

These objectives are directly related to two main research questions which should be answered in giving the detail of the changing patterns of rural sectors of economy for its self-sustained growth. They are as:

(1) What are evolving landuse patterns in the specific physiographic set up of the state?

(2) How do the changes take place in landuse patterns in accordance with the changes in the intensity of beneficiaries of various related trades of landuses.

These questions are directly related to three major aspects of socio-economic development of the states as:

(a) whether the present landuse characteristics and evolving pattern are matching

with the geographical or specially physiographical set-up of the state,

(b) the changes in landuse and specially jhum land cultivation are brought up either by increase in population pressure on land or by implementation of NLUP in the state and

(c) the impact of NLUP on the sectors related to rural economy which can be interpreting landuse changes with respect to changes in the assistance in the various trades of rural sectors under NLUP in the state.

These questions can be answered to study the physiographical factors of the state and evolving landuse patterns under such specific physiographic conditions and also comparing the changes and levels of various trades of the different rural sectors with the intensification of beneficiaries in these trades during the implementation period of time of the NLUP.

7.0 Methods and Data Collection:

For the fulfilment of the above objectives, the impact assessment of NLUP on various sectors of economy can be done by correlating and comparing the attributes which are related to NLUP and economic sectors of the state. In fact the NLUP is implemented only in 12 blocks in the state which belong to two district - Aizawl and Lunglei. Therefore, that is our domain of the study area. The variables related to NLUP of various sectors and the performance of various sectors have been taken into account. The changes in the various sectors of economy and respectively the changes

in the beneficiaries who have been benefited by the implementation of NLUP during 1991 to 1997 is considered.

The data of the number of beneficiaries by the trades of various sectors and the changing nature of main sectors of economy, namely, Agriculture and Allied sector, Animal Husbandry and Veterinary Sector, and Industry Sector have been collected for two points of time, i.e., 1991 as base year and 1997 as the current year. For showing the temporal changes and impact assessment the data is collected from various, which would be helpful for explaining the impact of NLUP in the state.

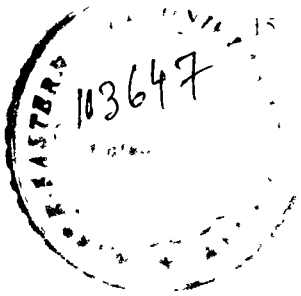
Table - 1.1: Sources of data.

Sl No	Nature of Data	Source	Year
1	Abstract of NLUP Beneficiaries	Commissionarate of Rural Development, Government of Mizoram	1991
2	Final area and production of Agricultural crops	Directorate of Agriculture, Government of Mizoram	1991 to 1997
3	Final area and production of Horticulture crops	Directorate of Agriculture, Government of Mizoram	1991 to 1997
4	Report of 14th and 16th Quinquennial livestock, Census of Mizoram	Directorate of A.H. & Veterinary, Government of Mizoram	1987 to 1997
5	Number of Industrial units in village wise	Rualkhuma Colney	1991
6	Report of Soil & Land Capability	Soil Survey Organisation, Department of Agriculture, Government of Mizoram	1991, 1992, 1993, 1995, 1996 & 1997
7	Area (in Ha) under different slope class in Mizoram	C. Thansanga	1999
8	District Census Handbooks	Directorate of Census Operations, Mizoram	1991
9	Statistical Handbooks	Directorate of Economics and Statistics, Aizawl, Government of Mizoram	1991 to 1998

In order to compare and contrast the changes of the attributes generated from the data of 12 blocks in the state, various cartographic methods have been used The distributional pattern of beneficiaries and changes in various economic sectors have been shown by maps and diagrams. The relationship of the variables related to the intensity of beneficiaries per areal unit with the changes of various economic sectors have been shown by scatter diagrams which will give us the causes of change.

8.0 Chapter Scheme:

The material of the dissertation is divided into six chapters. The Chapter-I is an introductory part revealing the nature of the problem, objectives, methodology, collection of data and design of the study. Chapter-II deals with the nature and organisation of New Land Use Policy in Mizoram. Chapter-III deals with geographical personality of the whole of state. The Chapter-IV explains the land use system in Mizoram and conditions of Land for land use. While, Chapter-V examines the impact of NLUP for the development of rural areas in the state. The last Chapter includes conclusions and initial findings and also mention with some suggestions about the scheme (NLUP).



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CHAPTER – II

NATURE AND ORGANISATION OF NEW LAND USE POLICY (NLUP)

1.0 Introduction:

Jhum cultivation, a primitive mode of farming which entails large scale cutting of forests and clearing the forests by burning, is common in Mizoram especially among the rural people. This method of farming has caused a consideration of forests in the state and many Government Agencies are working to put the jhumland to productive use.

On 24th November 1984, the Council of Ministers had a meeting and discussed about the problems of jhum cultivation. It was decided in the meeting that the State Government shall take measures to control shifting cultivation. The Cabinet meeting decided to perform a new scheme known as New Land Use Policy (NLUP) to replace the jhum cultivation. And the Cabinet meeting made guidelines for the implementation of this NLUP under the following mode.

Land areas, which are not allotted to individual families for permanent cultivation will remain natural, preserved and protected. On the basis of capacity of individual family to utilise land with available assistance by the Government and

survey of the land being made. suitable land will be allotted to individual rural family for permanent cultivation and the land should be used by him/her at least five years from the date of allotment.

The beneficiaries of the scheme are not permitted to take up any other land for jhuming. The Government will withdraw any assistance from those beneficiaries who practice jhuming.

The Government will take all possible measures to create and promote market avenues for agriculture and forests products within and outside the state.

The state Government will take measures and adopt operational procedures as follows:

1. All the existing land under Wet Rice Cultivation (WRC) will be identified and surveyed; the survey record will be made out village wise.
2. Land suitable for WRC will be identified, surveyed and recorded. If the present owner of such land is failed to utilise the land within one year, their pass will be cancelled or the land may be acquired to be allotted to deserving families.
3. Survey and allotment of land will be made in consultation and co-operation with the people concerned.
4. If the suitable land for WRC is limited, the rural population will have to be provided trades other than WRC.
5. For every year, the agency appointed by the Government will prepare a project for the development of scientific use of land to allot it.

6. Land will be allotted to individual family at first instance on lease basis for a period of ten years and during this period no transfer on scale of the land will be permitted by the Government. permanent allotment will be given only after the land is utilised by the family for the purpose it was allotted.

2.0 Genesis of NLUP:

The NLUP was first implemented in the financial year of 1984-85 under centrally sponsored scheme - Social Forestry. and the scheme was in the hand of Environment and Forests Department at that time. In 1984-85, 1,225 families were taken under NLUP by the Forests Department, and Rs. 36.75 lakhs was spent during this year.

In 1985-86, another 1,557 families were selected to take up the scheme while 241 families out of 1,225 families in the previous year were dropped due to bad performance. Those selected families had planted an area or 2,725.7 ha of land and an amount of Rs. 76.23 lakhs was spent during this year.

During the year 1986-87, 301 families were again dropped from the scheme and 414 families were newly selected. The beneficiaries planted an area of 2,663.2 ha and the Government has incurred an expenditure of Rs. 79.62 lakhs.

In 1987, a new ministry has come out and the state Government policy was changed. The scheme of NLUP was replaced by Jhum Control Project. And the first

phase on NLUP was closed in 1987. Jhum Control Project was implemented in Aibawk Rural Development Block. The Agriculture Department was the Nodal Agency for implementation of this project. Under this programme, the project offered a mono scheme. the target families were allowed to select only one scheme with out any subsidiary schemes. It was later found that the project suffered from many drawbacks and the cultivators hesitate to take up the scheme as a mean of their livelihood as it was difficult for them to tide over the gestation period (5-7 years).

By understanding the severe problems faced by the Jhum Control Project, in 1989, the NLUP was revived and the Rural development Department was entrusted for the implementation of the programme from 1990-'91. The programme was implemented on the pattern adopted under Jhum Control Project with modification in the scheme. Instead of mono scheme, a composite scheme which can provide suitable subsidiary trades for the beneficiaries was introduced. The subsidiary trades were offered to the beneficiaries for generation of substantial income during the long gestation period of the main trades.

3.0 Organisation and Implementation:

The state Government felt necessary that for effective implementation of this programme. Following the recommendation of Dr. G.V. Rao, Rural Development Department has been re-organised and enlarged into a Commissionarate (p.3). This Commissionarate consists of Commissioner, Officers and staff from the ten

department directly concerned in the implementation of NLUP, viz., Agriculture, Horticulture, Animal Husbandry & Veterinary, Sericulture, Soil & Water Conservation, Industries, Finance & Accounts, Fisheries, Environment & Forests, Information & Public relations which started functioning immediately (1990-'91) with vigour (1991, p.3 and 1997 p. 4).

The Department of Rural Development laid down the guidelines of NLUP, and clear aims and objectives to be achieved are also mentioned (Garbyal 1999, pp.137-138) which are:

1. to put an end to the practices of hill side jhum cultivation,
2. to induce the jhumia families to take up an alternative permanent means of livelihood under Agriculture or Industries or Animal Husbandry & Veterinary Sectors,
3. to take up WRC in all potential flat land in order to promote self sufficient in food production,
4. to protect and to intensify afforestation the remaining land other than those allotted land for the programme of NLUP, and
5. to provide marketing outlet of produces from New Land Use Policy programme.

It is obvious from the organisational part other than the NLUP has a wide perspective of rural development with is integrated development various sectors of rural economy which is related to jhum cultivation system in the state.

Implementation of this programme is based on environment and Agro-climatic conditions of the region and potentials of the land consisting of WRC, Horticulture, Terrace cultivation, Livestock rearing, small-scale industries and cottage industries. Under this programme, the selection of trades by beneficiaries will be based on their respective option suited to their aptitude, skill and viability; selection of beneficiaries will be strictly based on:

1. Jhumia families who depend on shifting cultivation for their livelihood, and
2. Families who have not permanent means of livelihood.

This programme does not include families who have permanent means of livelihood such as-Government Servants, Merchants and Business persons, Registered contractors, Full time Mission Workers, Employee of Deficit Schools etc. (Government of Mizoram NLUP 1991, 1997).

The state Government laid down the penalty for those beneficiaries who misuse and abuse of their assistance. The misuse and abuse of assistance include-

1. Those beneficiaries shift to another villages or blocks without the permission of the state government.
2. Selling of any assistance from NLUP – Money or machines or any material with out the permission of the Government.
3. Those who used the assistance not for the implementation of the programme.

4. Selling of trades. e.g., WRC. Sugar cane. etc with out the permission of the Government.

Those who misuse or abuse the assistance from the Government could not receive any assistance for NLUP. they must refund whatever they received for the implementation of NLUP. If they are not able to refund, the Government can take action upon them.

The Quantum of assistance of each beneficiary is not more than Rs. 30,000/- (Government of Mizoram 1991) but revised the amount of assistance for each beneficiary (Government of Mizoram 1997). Now the amount ranges from Rs. 34,850/-to 35,000/- for Agriculture & allied sector, Rs. 20,000/- to Rs. 45,000/- for Animal Husbandry & Veterinary sectors, Rs. 33,420/- to Rs. 58,200/- for Industrial sectors. The period of implementation of various schemes also revised from three to four years. Different trades under this scheme can broadly be categorised into three sectors, namely,

1. Agriculture & allied Sector
2. Animal Husbandry & Veterinary Sector
3. Industrial Sector (specially cottage industries).

These are major sectors of rural economy which are closely related to landuse and its changing patterns and overall integrated development of rural societies. The details of these sectors are given below:

(1) *Agriculture and Allied Sector:*

The Agriculture and allied Sector comprises 28 main trades and 5 subsidiary trades (Government of Mizoram, 1991, 1997. NLUP Beneficiaries 1991, Garbyal 1999). The main trades under these sectors are –

1. Mandarin Orange
2. Sweet Orange
3. WRC
4. Assam Lemon
5. Pineapple
6. Sugarcane
7. Hatkora
8. Terracing
9. Tung
10. Pisciculture
11. Valencia
12. Mango
13. Citronella
14. Coffee
15. Tea
16. Banana
17. Passion Fruit
18. Sericulture
19. Apple
20. Grape
21. Jamir
22. Kagji Lime
23. Teak
24. Coconut
25. Betelvine
26. Arecanut
27. Pomelo
28. Litchi

The five subsidiary trades are –

1. Vegetable garden
2. Piggery
3. Poultry
4. Betelvine
5. Duckery

(2) *Animal Husbandry and Veterinary Sector:*

Under this sector, there are eight main trades and two types of subsidiary trades (Government of Mizoram, 1991, 1997). The main trades and their subsidiary trades are shown here –

Main Trades	Subsidiary Trades
1. Hill cattle/ Mithun	Vegetables
2. Dairying	Nil
3. Piggery	Vegetables
4. Goat rearing	Piggery
5. Poultry	Vegetables
6. Rabbit rearing	Vegetables
7. Duck rearing	(a) Vegetables (b) Piggery
8. Sheep rearing	Piggery

(3) *Industry Sector:*

The industry sector comprises 15 main trades with three types of subsidiary trades (Government of Mizoram, 1991, 1997). Different trades under industry sector are as follows–

Main Trades	Subsidiary Trades
1. Carpentry	Nil
2. Black Smithy (Electrified and Non-Electrified)	Piggery/Poultry/Vegetables
3. Tailoring	Piggery/Poultry/Vegetables
4. Handloom	Piggery/Poultry/Vegetables
5. Bakery	Piggery/Poultry/Vegetables
6. Shoe repairing	Piggery/Poultry/Vegetables
7. Rice huller (Electrified and Non-Electrified)	Piggery/Poultry/Vegetables
8. Knitting	Piggery/Poultry/Vegetables
9. Cane and Bamboo	Piggery/Poultry/Vegetables
10. Chow making	Piggery/Poultry/Vegetables
11. Tinsmithy	Piggery/Poultry/Vegetables
12. Radio repairing	Piggery/Poultry/Vegetables
13. Motor workshop	Piggery/Poultry/Vegetables
14. Watch repairing	Piggery/Poultry/Vegetables
15. Arts and Painting	Piggery/Poultry/Vegetables

4.0 Implementation of New Land Use Policy:

The NLUP first started from 1990-91 which was initially programmed to be operated on a yearly basis and it was envisaged to cover all the 20 Blocks within the 8th Five Year Plan period (1992-97). However, due to financial constraints, the programme have to stretched to the Rural Development Blocks by the 9th Five Year Plan Period (Government of Mizoram, 1997, p. 4). But the scheme was eliminated in 1998.

For the year 1990-91, a sum of Rs 1,200/-laks was allocated in four Rural Development Blocks, viz., (1) Thingsulthliah, (2) W. Phaileng, (3) Reiek, (4) Lungsen Rural Development Blocks (Government of Mizoram, 1998).

The information and data for different trades have been collected from different volumes of 'Abstract of NLUP Beneficiaries', Government of Mizoram, Aizawl. The implementation of NLUP has various aspects which are related to raise the productivity and to bring the changes in the level of rural economy. When this policy was implemented in 1990-91 by the Government of Mizoram, it is kept in mind the integrated view of rural development through NLUP. Two are major aspects of implementation:

(a) The choice of beneficiaries: It is restricted the choice of sample farmers based on whether they must be jhumias or landless to get a piece of land for raising agricultural productivity and diversifying the rural activities related to availability of local resources.
(b) The allotment of land and its site which has an agro-ecological perspective and specific niches for landuse intensification. The agro-climatic and socio-economic factors of the land are considered for the land allotment. On the basis of such criteria of selection of beneficiaries and geographical factors, the following are the patterns of beneficiaries by their trades in different C.D. Blocks.

Thingsultthliah R.D.Block:

In Thingsulthliah Block, eight different trades under Agriculture and Allied sector are offered, viz., WRC, Dry Terrace, Sugarcane, Horticulture, Pisciculture, Sericulture, Tung and Teak. 23 villages benefited the assistance under this sector. The number of beneficiaries under different trades are-179 under WRC, 45 under Dry Terrace, 568 under Sugarcane, 419 under Horticulture, 12 under Pisciculture, 5 under

Sericulture. 570 under Tung. and 3 under Teak plantation. The total number of beneficiaries under this sector is 1,423 families.

Total 9 different trades are offered under Animal Husbandry & Veterinary sector. viz., Piggery, Dairy farming. Hill cattle. Goat rearing, Duckery, Poultry. Sheep rearing, Mithun and Rabbit rearing. There are 983 beneficiaries in Piggery activity. 60 under Dairy farming, 246 under Hill cattle, 45 under Goat rearing, 3 under Duckery. 68 under Poultry, 2 under Sheep rearing, 28 under Mithun, and 3 families under Rabbit rearing. The total number of beneficiaries under this sector is 1,438 families from 24 villages.

In Industry sector, 152 families under Carpentry, 75 under Tailoring, 11 under Watch repairing, 14 under Handloom, 15 under Bakery, 2 under Arts & Painting, 6 under Chow making, 12 under Tinsmithy, 17 under Blacksmithy, 5 under Shoe repairing, 2 under Motor works, 8 under Knitting, 1 under Cane & Bamboo, and 1 under Rice huller got the Government assistance for the implementation of NLUP. The total number of beneficiaries under this sector is 321 under 14 different trades.

Phaileng 'W' R.D.Block:

In Phaileng 'W' R.D. Block, 10 different trades under Agriculture & Allied Sector are offered, viz., Orange, Hatkora, Betelnut, WRC, Dry terrace, Coconut, Fishery, Tung, Tea and Cytronella. The number of beneficiaries in trade wise under

this sector are-643 under Orange. 66 under Hatkora. 317 under Betelnut. 208 under WRC. 33 under Dry terrace. 5 under Coconut. 194 under Fishery. 24 under Tung. 14 under tea. and 17 under Cytronella. The total number of beneficiaries under this sector is 1.521 families from 25 villages

Under Animal Husbandry & Veterinary sector, only five trades, viz., Piggery, Hill cattle. Goat rearing, Poultry, and Dairy farming are offered for 24 villages. The number of beneficiaries under different trades are 855 families under Piggery, 536 families under Hill cattle, 185 under Goat rearing, 48 under Poultry, and 2 families under Dairy farming. The total number of beneficiaries under this sector is 1,626 families.

There are 12 trades under Industrial sector such as Carpentry, Bakery, Tailoring, Handloom, Knitting, Caneworks, Painting, Tinsmithy, Motorworks, Watch repairing and Rice huller. Total 19 villages were selected for this sector, the number of beneficiaries under different trades are-72 under Carpentry, 15 under Bakery, 31 under Tailoring, 13 under Handloom, 7 under Blacksmithy, 1 under Knitting, 3 under Caneworks, 2 under Painting, 1 under Tinsmithy, 1 under Motor works, 1 under Watch repairing and 1 under Rice huller. A total number of 148 families were benefited under this sector. The grand total of beneficiaries from this R.D. Block is recorded 3,295 families.

Reiek R.D. Block:

The total 24 villages from Reiek R.D. Block were assisted under NLUP scheme. Initially 1,847 families were selected but 113 families were dropped from the scheme.

There are 10 different trades under Agriculture & Allied sector, viz., WRC, Orange, Tung, Lemon, Pine apple, Sugarcane, Hatkora, Terracing, Sericulture and Pisciculture. The number of families assisted under different trades are-223 under WRC, 439 under Orange, 11 under Lemon, 10 under Pineapple, 9 under Sugarcane, 101 under Hatkora, 17 under Terracing, 68 under Tung, 8 under Sericulture and 17 under Pisciculture. But some families who failed to continue their works for some reason were dropped from the list of beneficiaries, viz., 24 from WRC, 2 from Orange, 1 from Pineapple, 4 from Hatkora, 1 from Terracing, 5 from Pisciculture, 6 from Tung, 1 from Sericultute, and 63 families are dropped from Agriculture & Allied sector.

Seven different main trades such as Piggery, Hill Cattle, Dairy farming, Goat rearing, Sheep rearing, Duckery and Poultry farming were offered under Animal Husbandry & Veterinary Sector. And 22 villages were selected for these trades. The number of beneficiaries under different trades are - 583 under Piggery, 114 under Hill cattle, 15 under Dairy farming, 24 under Goat rearing, 5 under Sheep rearing, 3 under Duckery, 56 under Poultry farming. The total number of beneficiaries under Animal

Husbandry & Veterinary Sector is 800 families. In addition to these main trades, a special scheme of piggery is offered to 41 families from 8 villages.

Industry sector consists the least number of beneficiaries. It covers only 31 families from 10 villages. the number of beneficiaries under each trade are - 14 families under Carpentry, 10 families under Tailoring, 3 families under Handloom, 2 families under Bakery, 1 family under Blacksmithy, and another one family under Watch repairing. Some beneficiaries are dropped for some reasons-3 families under Carpentry, 3 families under Tailoring, and 2 families under Bakery are dropped from the list. In this Rural Development Block, 1,734 beneficiaries are assisted under three sectors.

Lungsen R.D. Block:

Lungsen R.D. Block having the biggest number of villages among the R.D. Blocks of Mizoram is also selected in this phase. The total of 2,066 families were assisted under Agriculture and Allied sector, 2,308 families under Animal Husbandry & Veterinary sector, and 283 families are selected for Industry sector. The number of families assisted under these three sector are 4,657 in number.

Under Agriculture & Allied sector, 1,071 families were selected for horticulture, 3 families for Sericulture, 897 families for WRC, 43 families for

Fisheries, 13 families for Coffee plantation, 37 families for Terracing, and 2 families for Orange. This Agriculture & Allied sector covers 68 villages within this Block.

Four different main trades viz. Piggery, Goat rearing, Hill cattle, and Cross breed were offered under Animal Husbandry & Veterinary sector. The number of assisted families under different trades are – 1,567 families under Piggery, 30 families under Goat rearing, 710 families under Hill cattle, and 1 family under Cross breed. 2,308 families are selected for the Animal Husbandry & Veterinary sector.

Among 17 trades under Industry sector, 14 trades, viz., Tinsmithy, Bakery, Handloom, Carpentry, Tailoring and Blacksmithy were allotted in this Block. The total number of 23 families were selected for Bakery, 1 family for Tinsmithy, 38 families for Handloom, 147 families for Carpentry, 65 families for Tailoring and 9 families for Blacksmithy from 18 villages.

In 1991-92, Rs. 2,070/- lakhs was sanctioned and two new Blocks, viz., Thingdawl and Zawlnuam Blocks were taken up while the on going schemes of the four previous selected Blocks was maintained.

Thingdawl R.D.Block:

From Thingdawl Block a quite significant number of villages that is 29 was selected for Agriculture & Allied sector, the number of assisted families under

different trades were as follows – 1,013 under Hatkora, 1,208 under Orange, 599 under WRC, 1,008 under Arecanut, 299 under Pisciculture, 2 under Teak, 15 under Tea, 1 under Passion fruit, 20 under Coconut, 117 under Assam lemon, 279 under Sugarcane, 32 under Sericulture, 63 under Terracing, 47 under Tung, and 10 families under Banana. The number of beneficiaries under Agriculture & Allied sector is 4,715. As this Block has suitable conditions for Horticulture fruits, some fruits like Hatkora, Orange and Assam-lemon are selected by 2,338 families from 4,715 families.

Under Animal Husbandry & Veterinary sector, Piggery, Poultry, Goat rearing, Dairy farming, Rabbit rearing, Duckery and Hill cattle are opted by 1,245 families from 29 villages. The trade wise beneficiaries are: Piggery – 834, Poultry – 67, Goat rearing – 44, Dairy farming – 131, Rabbit rearing – 2, Duckery – 16, and Hill cattle – 151 families.

There are 16 trades under Industry sector which were allotted to Thingdawl R.D. Block. The number of beneficiaries in trade wise are shown here: Carpentry – 118, Tailoring – 109, Rice huller – 46, Blacksmithy – 19, Handloom – 26, Shoe repairing – 25, Watch repairing – 13, Radio repairing – 10, Motor works – 21, Tinsmithy – 6, Knitting – 11, Arts and painting – 9, Canework – 2, Bakery – 29, Chow making – 15, Steel fabrication – 2. The number of assisted families are 461.

Zawlnuam R.D Block:

In the *Zawlnuam R.D. Block,* 12 main trades were offered under Agriculture & Allied sector covering 3,055 families. The number of beneficiaries in trade wise are - Hatkora - 667, Orange - 960, WRC – 485, Arecanut - 437, Pisiculture - 278, Tea - 76, Pineapple - 49, Coconut - 43, Lemon - 30, Sugarcane - 22, Sericulture 5 and Terracing - 3. More than 55 percent of the beneficiaries are concentrated on Horticulture fruits like Hatkora, Orange, Pineapple and Lemon.

Under Animal Husbandry & Veterinary, there are only 6 trades, viz., Hill cattle, Piggery, Goat rearing, Duckery, Sheep rearing and Dairy farming are offered to Zawlnuam R.D. Block. The number of selected families for different trades are 382 for Hill cattle, 384 for Piggery, 79 for Goat rearing, 26 for Duckery, 10 for Sheep rearing and 4 families for Dairy farming. The total number of beneficiaries under these trades were 885.

Industry sector consisting 15 different trades for Zawlnuam Block covers 163 families from 21 villages, the different trades with the number of families under each trade are - Carpentry - 62, Tailoring - 32, Rice huller - 10, Blacksmithy - 8, Handloom - 6, Shoe repairing - 5, Watch repairing - 4, Radio repairing - 3, Motor works - 3, Tinsmithy - 4, Knitting - 1, Arts and Painting - 1, Cane and Bamboo - 2, Bakery - 19, Chow making - 3.

During 1992 - '93, an amount of Rs. 2,220/- lakhs was allocated, no new Blocks was taken up and concentration was given towards on-going works. In 1993 - '94, the State Government allotted Rs. 2,770/- lakhs for the implementation of the programme. Serchhip Block and part of Lungdar 'E' Block were covered.

Serchhip R.D. Block:

Under Agriculture & Allied sector, 17 trades were offered to Serchhip Block including Rawpui and Sailam villages. The name of the trades and numbers on beneficiaries under each trade are - Valencia - 39, Orange - 572, Hatkora - 26, Tung - 471, Assam lemon - 19, Mango - 11, Sugarcane - 273, Citronella - 18, Coffee - 2, Tea - 37, Banana - 101, Pineapple - 381, Passion fruit - 55, WRC - 700, Terracing - 150, Sericulture - 14, Pisciculture 19. The total beneficiaries under this sector are 2,960.

Eight main trades are offered under Animal Husbandry & Veterinary sector, the name of the trades and number of beneficiaries are: Hill cattle - 226, Piggery - 428, Mithun farming - 81, Goat rearing - 39, Duckery - 7, Poultry - 141, Sheep rearing - 14, Dairy farming - 137, total number of beneficiaries are 1,023.

Under Industry sector, 401 families were assisted from 20 villages, and 13 different trades were opted by the beneficiaries. The name of the trades with number of beneficiaries are - Carpentry - 36, Blacksmithy - 13, Tailoring - 60, Handloom - 55,

Bakery - 17, Shoe repairing - 18, Rice huller - 70, Knitting - 10, Radio repairing - 11, Motor works - 18, Watch repairing - 11, Arts & Painting - 3, Steel fabrication - 6.

The number of beneficiaries from this Block (including Rawpui & Sailam) is 4434.

Lungdar East R.D. Block I:

The programme was started in a part of Lungdar East Block in 1993-94 and 13 villages with 1,602 beneficiaries were selected for the purpose. In Agriculture & Allied sector, 13 trades were opted by 1,150 families. The name of the trades with number of beneficiaries are - WRC - 318, Orange - 192, Tea - 168, Tung - 364, Pineapple - 9, Hatkora - 1, Banana - 5, Pisciculture - 8, Sugarcane - 65, Passion fruit - 12, Mango - 1, Sericulture - 6, Grape - 1.

There are six different trades under Animal Husbandry & Veterinary sector, viz., Hill cattle, Dairy farming, Sheep rearing, Goat rearing, Poultry and Piggery. Number of assisted families under different trades are - 134 under Hill cattle, 16 under Dairy farming, 3 under Sheep rearing, 21 under Goat rearing, 37 under Poultry, 112 under Piggery.

Under Industry sector, there are 15 trades, though knitting is offered to the beneficiaries, no one is opted for this trade. The name of the trades and number of

beneficiaries under these trades were - Carpentry - 37, Rice huller - 36, Handloom - 5, Blacksmithy - 7, Bakery - 11, Tailoring - 14, Chow making - 4, Radio repairing - 2, Motor works - 3, Arts & painting - 1, Watch repairing - 2, Cane & Bamboo - 2, Tinsmithy - 1, Steel fabrication - 1, Shoe repairing - 3.

During 1994-95, Rs. 2.830/- lakhs was allocated for implementing various programmes of the NLUP. However, as a result of revised plan the amount was reduced to Rs. 2,497/- lakhs. In this fifth phase, the programme covered Khawzawl R.D. Block, Lunglei R.D. Block remaining part of Lungdar 'E', Marpara 'S' village of 'W' Phaileng R.D. Block, and the on-going works at Serchhip and part of Lungdar 'E' Rural Development Blocks.

Khawzawl R.D. Block I:

Out of 43 villages, 25 villages from Khawzawl R.D. Blcok were selected under Agriculture & Allied Sector with 14 trades. The number of beneficiaries under each trade are – 218 under WRC, 26 under Orange, 1 under Hatkora, 1 under Assam lemon, 433 under Passion fruit, 20 under Sugarcane, 2 under Banana, 2 under Pineapple, 3 under Sericulture, 74 under Terraching, 48 under Pisciculture, 1286 under Tung, 12 under Grape, and 6 families under Jamir trade. The total number of beneficiaries from Agriculture & Allied sector were 2,132 families.

For the implementation of the NLUP. 8 different trades. viz.. Piggery. Goat rearing. Hill cattle, Poultry, Dairy farming. Sheep rearing, Rabbitry and Mithun rearing were allocated under Animal Husbandry & Veterinary Sector. This sector covered 25 villages with 3,372 families. The number of assisted families in each trade are as follows – 174 families in Piggery. 40 families in Goat rearing. 536 families in Hill cattle. 107 families in Poultry, 16 families in Dairy farming, 29 families in Sheep rearing. 4 families in Rabbitry, 12 families in Mithun rearing, 918 families were assisted under this sector.

A total of 15 different trades from Industry sector was offered to 23 villages of this Block and 218 families were selected for these 15 trades. The number of families engaged in each trade are 51 in Carpentry, 49 in Rice huller, 43 in Tailoring, 4 in Cane & Bamboo, 16 in Blacksmithy, 5 in Knitting, 7 in Shoe repairing, 5 in Tinsmithy, 10 in Bakery, 6 in Watch repairing, 3 in Chow making, 2 in Motor works, 13 in Handloom, 3 in Radio repairing, and 1 family in Arts & Painting.

Lunglei R.D. Block I:

Some parts of Lunglei R.D. Block (17 villages) were selected during this period, 795 families under Agriculture and Allied sector, 100 families under Industry sector and 328 families under Animal Husbandry & Veterinary sector received the Government assistance for the implementation of the NLUP. The number of Beneficiaries of each trade under the three sectors are shown here.

Under Agriculture & Allied sector, 236 families in WRC, 61 in Terracing, 59 in Orange, 179 in Banana, 91 in Tung, 8 in Pineapple, 62 in Sugarcane, 1 in Mango, 11 in Passion fruit, 22 in Sericulture and 65 in Pisciculture.

Under Animal Husbandry & Veterinary sector, 182 families in Piggery, 19 in Hill cattle, 94 families in Goat rearing, 18 in Dairying, and 15 families in Poultry.

In Industry sector, 21 families in Handloom, 23 in Carpentry, 21 in Rice huller, 12 in Tailoring, 4 in Bakery, 1 in Chow making, 8 in Blacksmithy, 2 in Shoe repairing, 3 in Watch repairing, 3 in Tinsmithy, and 1 in Arts & Painting.

Lungdar 'E' R.D. Block II:

The remaining part of Lungdar 'E' Block comprising 28 villages was covered in this phase, and 5,039 beneficiaries were assisted under this programme.

A total number of 16 trades of Agriculture & Allied sectors are given to 28 villages, and the number of families engaged in each trade are – 380 in WRC, 138 in Terracing, 37 in Orange, 841 in Tung, 6 in Jamir, 414 in Passion fruit, 130 in Pisciculture, 40 in Sericulture, 1 in Hatkora, 33 in Sugarcane, 1 in Assam lemon, 2 in Mango, 7 in Pineapple, 8 in Banana, 1 in Arecanut, and 69 in Apple.

In Animal Husbandry & Veterinary sector, 8 main trades were offered to 3,623 beneficiaries. The number of beneficiaries under different trades are as shown here – 495 under Hill cattle, 124 under Piggery, 58 under Poultry, 56 under Goat rearing, 11 under Sheep rearing, 54 under Dairying, 1 under Rabbitry, and 350 under Mithun rearing.

There are 14 trades under Industry Sector and are allocated to 25 villages Different trades with number at assisted families were Knitting – 7, Rice huller – 44, Tailoring – 32, Handloom – 12, Black smithy – 5, Motor works – 3, Shoe repairing – 10, Carpentry – 54, Steel fabrication – 1, and Arts & Painting – 1.

Marpara 'S' Village (Phaileng 'W' R.D. Block):

The programme allotted to Marpara 'S' Village (Phaileng 'W' R.D. Block) was concentrated towards Agriculture & Allied sector, especially in areas palm and WRC. Initially 317 families are selected for Areca palm but 14 beneficiaries are deleted from the list of NLUP beneficiaries due to various reasons – like migrated, not found, expired and doubtful citizen. The 19 families were selected for the trade of wet rice cultivation. The total number of beneficiaries from this village is 336.

In 1995-'96, new beneficiaries of Khawzawl R.D. Block, and part of Tlangnuam Block (including Nisapui Model village) were taken up. Rs. 2,500/- lakhs was allocated for the implementation of NLUP scheme in two new Blocks and on-

going works at Serchhip, Lungdar (phase I & II), Lunglei (phase I), Khawzawl and Marpara 'S' village.

Khawzawl R D Block II

19 villages from Khawzawl R.D.Block were selected during this phase. It is also known as Khawzawl II R.D.Block. The trades offered under Agriculture & Allied sector are 17 in number. The number of families assisted under different trades are as follows: 2 families in Assam lemon, 8 families in Apple, 13 families in Banana, 1 family in Chow chow, 6 families in Kagzi lime, 1 family in Grapes, 225 families in Passion fruit, 54 families in Orange, 1 family in Jamir, 2 families in Pineapple, 39 families in Pisciculture, 3 families in Sericulture, 62 families in Sugarcane, 1 family in Valencia, 67 families in Terracing, 1,137 families in Tung, and 281 families in WRC. All the beneficiaries of these 17 trades are 1,903. Though the programme is allocated to 19 villages, the beneficiaries from two villages – Lungphunlian and Vankal did not opt any trade from Agriculture & Allied sector.

There are 9 main trades under Animal Husbandry & Veterinary Sector covering 1,044 families from 19 villages. The number of beneficiaries under different trades are – 22 under Dairying, 1 under Duckery, 68 under Goat rearing, 474 under Hill cattle, 104 under Mithun rearing, 277 under Piggery, 89 under Poultry, 2 under Rabbitry, and 7 under Sheep rearing. Under industry sector, there are 16 trades, and it covers 15 villages. The number of families under different trades of this sector are – 1

family under Arts & Painting, 3 families under Bakery, 6 families under Blacksmithy, 5 families under Cane & Bamboo, 32 families under Carpentry, 2 families under Chow making, 16 families under Handloom, 1 family under Knitting, 6 families under Motor Works, 2 families under Radio Repairing, 26 families under Rice huller, 6 families under Shoe repairing, 2 families under Steel fabrication, 29 families under Tailoring, 5 families under Tinsmithy and 3 families under Watch repairing.

In this period, the total number of 3,092 beneficiaries under Agriculture & Allied sector, Animal Husbandry & Veterinary sector and Industry sector were assisted by the State Government.

Tlangnuam Block I:

A part of Tlangnuam R.D.Block (including Nisapui Model village) covering 7 villages were selected to implement the programme during this phase, and the families engaged in the programme were 1,467. Under Agriculture & Allied sector, 615 families are assisted through 13 trades. The number of families engaged in each trade are – 5 in Assam lemon, 45 in Banana, 82 in Chow Chow, 31 in Harkora, 75 in Orange, 47 in Passion fruit, 14 in Sugarcane, 60 in Terracing, 120 in Tung, 36 in Pisciculture, 2 in Valencia, 97 in WRC, and 1 family in Betelvine.

Under Animal Husbandry & Veterinary sector, 758 families were assisted through 6 trades, the number of families engaged in different trades are – 395 families

in Dairying, 3 families in Goat rearing. 14 families in Hill cattle. 331 families in Piggery, 13 families in Poultry and 2 families in Rabbitry.

Total 15 different trades from Industry sector were offered to this Block and 82 families were assisted from this Sector. The number of families under each trade are as follows. 7 families under Bakery, 6 under Blacksmithy, 1 under Cane & Bamboo, 14 under Carpentry, 5 under Chow making, 2 under Handloom, 3 under Knitting. 2 under Motor works, 1 under Radio repairing, 9 under Rice huller, 6 under Shoe repairing, 1 under Steel fabrication, 21 under Tailoring, 3 under Tinsmithy, 1 family under Watch repairing.

For the year of 1996-97, Rs. 2,500/- lakhs was initially sanctioned for the implementation of the programme. However, as a result of revised sectoral allocated the amount was reduced to Rs. 2,300/- lakhs and the sanctioned money was allocated for undertaking on-going schemes at Lungdar 'E' (Second phase), Khawzawl, Lunglei, Marpar 'S' Village, Tlangnuam including Nisapui Model village (Project Report of NLUP 1997). In addition to the above on-going programme, the remaining parts of Tlangnuam R.D. Block, Khawzawl R.D. Block and Pukpui village of Lunglei R.D. Block were covered during this period.

Tlangnuam R.D.Block II:

During this period, 332 families from Tlangnuam R.D. Block were assisted through 18 trades under three Sectors, 230 families were engaged in 9 different trades of Agriculture & Allied sector. The total number of 94 families were assisted through 5 trades under Animal Husbandry & Veterinary sector, and 8 families were engaged in 4 trades of Industry sector. The scheme covered only 4 villages from Tlangnuam II R.D. Block. The number of families engaged in different trades are –

Under Agriculture & Allied sector, 123 families were engaged in Sugarcane, 40 families in Orange, 23 families in Tung, 2 families in Banana, 1 family in Hatkora, 2 families in Assam lemon, 6 families in Pisciculture, 1 family in Terracing, and 32 families are assisted through WRC.

Under Animal Husbandry & Veterinary sector, only 10 families were assisted through Dairying, 16 families through Hill cattle, 3 families are engaged in Goat rearing, 9 families in Poultry, 56 families in Piggery.

Among the 4 trades under Industry sector, Carpentry has been largest number of beneficiaries, i.e., 4 families, the other beneficiaries under Industry sector are 1 beneficiary under Tailoring, 2 beneficiaries under Rice huller, and another 1 beneficiary in Shoe repairing.

Khawzawl R.D. Block III:

For the third phase of NLUP in Khawzawl R.D. Block, Champhai town and Neihdawn Village were selected. Total 14 localities from Champhai town and the remaining part of Neihdawn village were assisted through 36 trades covering 2,353 families (2,336 families from Champhai town and the remaining 17 families from Neihdawn village).

Under the Agriculture & Allied sector, 11 trades were offers to 776 families, the number of beneficiaries under different trades were as shown below:

311 beneficiaries under Tung, 341 under WRC, 53 under Pisiculture, 25 under Passion fruit, 30 under Terracing, 4 under Sericulture, 2 under Grape, 4 under Orange, 1 under Sugarcane, 4 under Jamir and 1 under Hatkora.

Under Animal Husbandry & Veterinary sector, 1,334 families from Champhai town are assisted through 9 different trades. The number of beneficiaries of each trade are - 936 in Piggery, 106 in Poulatry, 151 in Hill cattle, 72 in Dairying, 7 in Goat rearing, 5 in Sheep rearing, 53 in Rabbit rearing, 3 in Duckery, 1 in Mithun rearing.

243 families from Champhai town were engaged in Industry sector. The number of trade wise beneficiaries are shown here - Tailoring - 93, Handloom - 13, Radio repairing - 9, Motor works - 18, Bakery - 11, Rice huller - 25, Carpentry - 39,

Chow making - 1, Shoe repairing - 7, Knitting - 6, Watch repairing - 5, Blacksmithy - 6, Arts and Painting - 4, Tinsmithy - 4, Steel fabrication - 1, and Beauty Parlour - 1. One notable thing in this Block is one beneficiary from Electric Veng Champhai is assisted through Beauty parlour. This is the only beneficiary under this kind of trade.

Lunglei R.D Block II - (Pukpui Village)

In the Pukpui village of Lunglei R.D. Block, 162 families received Government assistance for the implementation of NLUP. 41 families benefited from 5 trades under Agriculture & Allied sector, the number of families in each trade are 30 families in Tung plantation, 1 family in Passion fruit, 2 families in Pisiculture, 1 family under WRC, 6 families under Orange, and 1 family under Terracing.

7 trades under Industry sector are allocated to Pukpui village and 24 families were engaged in the 7 trades. Number of families engaged in different trades were - 9 families under Carpentry, 5 families under Tailoring, 3 families under Blacksmithy, 1 family under Tinsmithy, 3 families under Bakery, 1 family under Radio repairing and 2 families are assisted through Handloom.

Only 2 trades were offered under Animal Husbandry & Veterinary sector, viz. Piggery and Dairy farming. And they are allotted to 88 and 9 families.

In 1997-98, 2,629 families from 15 villages of Ngopa Block, and 1,717 families from 18 villages of Lunglei R.D. Block were selected for the implementation of the programme.

Ngopa R.D. Block

From 15 villages of Ngopa R.D. Block, 14 villages were offered 12 trades under Agriculture & Allied sector. The number of beneficiaries in different trades are - 7 beneficiaries in Banana, 2 beneficiaries in Betelvine, 31 beneficiaries in Orange, 1 beneficiary in Passion fruit, 3 beneficiaries in Pineapple, 49 beneficiaries in Pisciculture, 4 beneficiaries in Sericulture, 23 beneficiaries in Sugarcane, 74 beneficiaries in Terracing, 105 beneficiaries in Tung, 1 beneficiaries in Valencia, 262 beneficiaries in WRC, and the total beneficiaries under Agriculture & Allied Sector are 562.

Under Animal Husbandry & Veterinary sector, 9 different trades were offered to 1,887 families of 15 villages. The different trades with number of beneficiaries are - Dairying - 42, Duckery - 3, Goat rearing - 24, Hill cattle - 1156, Mithun - 143, Piggery - 454, Poultry - 55, Rabbitry - 8, and Sheep rearing with 2 families.

Industry sector consisting 12 trades were allocated to 180 families of 13 villages. Number of families having Government assistance through various trades are - 10 families in Bakery, 7 families in Blacksmithy, 56 families in Carpentry, 8

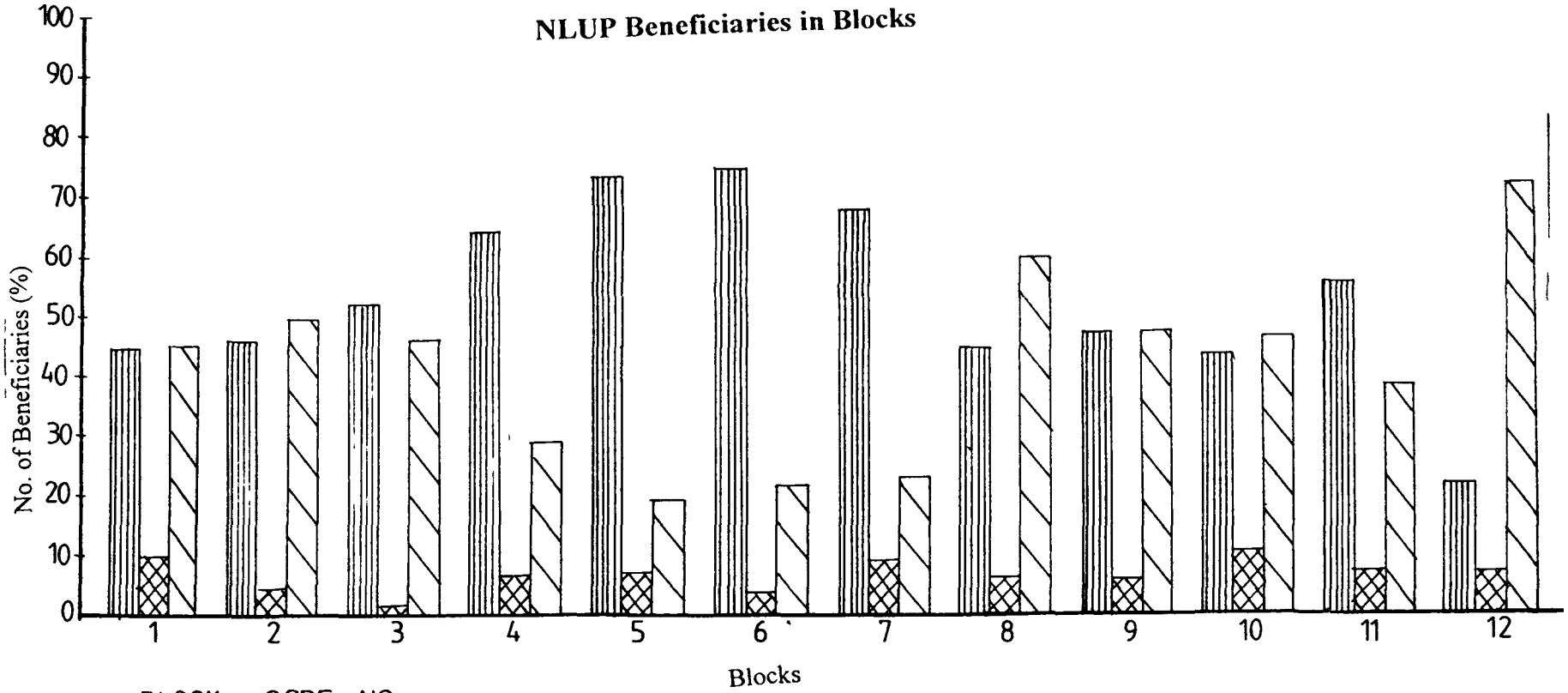
families in Handloom. 2 families in Knitting. 3 families in Radio Repairing. 2 families in Motor works. 45 families in Rice huller. 7 families in Shoe repairing. 30 families in Tailoring. 1 family in Tinsmithy and 9 families in watch repairing.

Lunglei R.D. Block (Tawipui Assembly Constituency):

Within Lunglei R.D. Block, 18 villages were selected from Tawipui Assembly Constituency. 506 families under Agriculture & Allied Sector, 1,013 families under Animal Husbandry & Veterinary Sector and 198 families under Industry sector were selected for the implementation of NLUP. The trade wise number of beneficiaries under the 3 sectors are as:

Under Agriculture & Allied sector, 5 families engaged in Assam Lemon, 33 in Banana, 61 in Betelvine, 13 in Gardening, 1 in Hatkora, 79 in Orange, 1 in Jamir, 5 in Passion fruit, 13 in Pineapple, 84 in Pisiculture, 2 in Sericulture, 17 in Sugarcane, 86 in Terracing, 45 in Tung, 1 in Valencia, and 60 families are engaged in WRC.

Under Animal Husbandry & Veterinary sector, 55 families were assigned to Dairy farming, 1 family to Duckery, 7 families are assisted through Goat rearing, 214 families through Hill cattle, 3 families were assisted through Mithun, 689 families were engaged in Piggery, 40 families in Poultry, and 4 families are engaged in Rabbitry.



BLOCK CODE NO

1. Thingsulthliah
2. W. Phaileng
3. Reiek
4. E. Lungdar (incl Khawbung Addl. Block)
5. Thingdawl
6. Zawlnuam
7. Serchhip + Rawpui & Sailam Vill
8. Lungsen
9. Tlangnuam
10. Lunglei
11 Khawzawl
12. Ngopa (incl. Phullen Addl. Block)

Agri & Allied Sector Industrial Sector A.H. & Vety Sector

Fig 2.1

Under Industrial Sector. 196 families were engaged in 14 different trades. The number of families in each trades are as follows: 4 families in Art & Painting. 13 in Bakery. 11 in Blacksmithy, 1 in Cane & Bamboo, 68 in Carpentry. 2 in Chow making. 9 in Handloom. 1 in Motor works. 7 in Radio repairing. 27 in Rice huller. 11 in Shoe repairing. 38 in Tailoring, 1 in Watch repairing and 5 families in Tinsmithy.

5.0 The Salient Features:

The trade-wise detail figures of beneficiaries are compiled and important trades of various sectors are featured here.

During the period of 1990-91 to 1997-98, 12 Rural Development Blocks were covered by this scheme. Under Agriculture & Allied sector, total 27,462 families were assisted through 28 trades. The number of families under each trade are – 5,517 families under WRC, 4,436 families under Orange, 193 families under Lemon, 484 families under Pineapple, 1,569 families under Sugar cane, 2,079 families under Hatkora, 771 families under Terracing, 5,533 families under Tung plantation, 1,454 families under Piscicultute, 44 families under Valencia, 15 families under Mango, 35 families under Citronella, 15 families under Coffee, 234 families under Tea, 405 families under Banana, 1,230 families under Passion fruit, 151 families under Sericulture, 77 families under Apple, 16 families under Grape, 18 families under Jamir. 6 families under Kagzilime, 81 families under Teak plantation, 68 families under Coconut, 66 families under Betelvine, 1,764 families under Betelnut, 1,112

families under Horticulture (though many Horticulture crops are enlisted under Agriculture & Allied sector. Horticulture is offered as a trade in Thingsulthliah and Lungsen R.D. Block). 13 families under Gardening, and 83 families under Chow chow.

WRC, Orange, Sugarcane, Hatkora, Tung. Pisiculture, Passion-fruit, Betel-nut are some important trades under Agriculture & Allied Sector. While WRC and Orange are distributed to the 12 Blocks, the other trades are concentrated in few Blocks. Sugarcane is focussed in the central range of the Northern part. Hatkora is concentrated in the North Western parts. Nearly 80 percent under Tung trade is found in Serchhip. Lungdar 'E', Thingdawl, Zawlnuam, Lunglei and Khawzawl R.D. Blocks. Above 90 percent of beneficiaries under Passion fruit are located in Lungdar 'E', and Khawzawl R.D.Blocks. All the beneficiaries under Betelnut except 2 from Lungdar 'E' and Lunglei R.D. Blocks are confined in Thingdawl, Zawlnuam and Marpara 'S' village (Phaileng 'W' R.D. Block) (Appendix-I).

Under Animal Husbandry & Veterinary sector. the total 18,270 families were assisted through 10 trades, the number of families under different trades are – 5,574 families under Hill cattle, 1,058 families under Dairy farming, 9057 families under Piggery, 769 families under Goat rearing, 909 families under Poultry, 79 families under Rabbitry, 63 families under Duckery, 88 families under Sheep rearing, 672 families under Mithun rearing, and 1 family under Crossbreed.

The important trades under Animal Husbandry & Veterinary Sector are Hill cattle, Dairy farming, Piggery, and Poultry. More than 96 percent of beneficiaries under Hill cattle are found in 'W' Phaileng, Lungdar 'E', Tlangnuam, Lungsen, Khawzawl and Ngopa R.D. Blocks.

Above 72 percent of beneficiaries under Dairy farming are confined in Thingdawl, Serchhip, Tlangnuam and Khawzawl R.D. Blocks. 72.7 percent of families assisted through Piggery are located in Thingsulthliah, *Phaileng 'W', Thingdawl, Lunglei, Lungsen,* and Khawzawl R.D. Blocks. About 49 percent of beneficiaries under Poultry farming are found in Serchhip and Khawzawl Rural Development Blocks (Appendix-II).

Under Industrial Sector, the total 3,357 families were assisted through 17 trades. The number of beneficiaries under different trades are - 30 families in Arts & Painting, 215 families in Bakery, 156 families in Blacksmithy, 26 families in Cane & Bamboo, 1037 families in Carpentry, 52 families in Chow making, 259 families in Handloom, 55 families in Knitting, 82 families in Motor works, 58 families in Radio Repairing, 412 families in Rice huller, 114 families in Shoe repairing, 14 families in Steel fabrication, 700 families in Tailoring, 67 families in Tinsmithy, 79 in Watch repairing and 1 family in Beauty parlour.

Among these 17 trades, Carpentry, Rice huller and Tailoring accounted for 64 percent of the total beneficiaries. Nearly 52 percent of beneficiaries under Tailoring are concentrated in *Thingsulthliah, Thingdawl, Lunglei, Lungsen* and *Khawzawl R D Blocks*

More than 60 percent of families under the trade of Rice huller are found in Lungdar 'E', Serchhip and Khawzawl R.D. Blocks. The 67 percent of beneficiaries under Tailoring are found in 5 Blocks, viz., *Thingsulthliah, Thingdawl, Lunglei, Lungsen* and *Khawzawl R.D. Blocks.*

6.0 Concluding Remarks:

From all these statements mentioned earlier, it is clear that the NLUP schemes had been successfully implemented in 12 R.D. Blocks. As agriculture is the most important occupation, the scheme was programmed to replace destructive and unproductive agriculture system (jhum cultivation). Agriculture sector has the largest number of beneficiaries. Animal Husbandry & Veterinary sectors come in the middle, and industrial sector has the least number of beneficiaries (Table-2.1 and Fig. – 2.1). The last column of the Table-2.1 shows percentage share of beneficiaries to total households in the Block. It reveals that almost all Blocks except Tlangnuam have more than 70 percent households covered under the scheme. Due to the lack of good transport system and power supply to generate industrial production in rural areas, the rural people are not interested in industrial sector. For the same, the genesis of the

NLUP may be studied and its results may be evaluated by considering the physiographic features and evolving patterns of landuse.

Table – 2.1: Number of beneficiaries and Percentage from Total Number of Households

Sl No.	Name of Blocks	No of Households	Number of Beneficiaries						Total number of three Sectors	
			Agri & Allied sector		A H. & Vety. sector		Industrial sector			
			Total	%	Total	%	Total	%	Total	%
1	Thingsulthliah	5806	1423	24 50	1438	24.76	321	5.52	3182	54.78
2	Pahileng 'W'	4685	1521	32.47	1626	34.70	148	3.06	3295	70.33
3	Reiek	2549	903	35.43	800	31.38	31	1.22	1734	68.03
4	Lungdar 'E'	4619	3258	70 53	1472	31.87	339	7.34	5069	109.74
5	Thingdawl	9572	4715	49 26	1245	13.01	461	4.82	6421	67 09
6	Zawlnuam	8025	3055	38 07	885	11.03	163	2.03	4073	51.13
7	Serchhip	5569	2960	53.15	1023	18.40	401	7.20	4384	78.75
8	Lungsen	5478	2066	37.71	2308	42.13	322	5.88	4696	85.72
9	Tlangnuam	38385	853	2 22	852	2.22	102	0.27	1867	4.71
10	Lunglei	10684	1343	12.57	1438	13.46	283	2.65	3064	28.68
11	Khawzawl	11302	4810	42 56	3296	29.16	606	5.36	8712	77.08
12	Ngopa	2757	562	2038	1887	68.44	180	6.53	2529	95 35
		109431	27469	25.43	18270	16.91	3357	3.11	49076	44.85

REFERENCE:

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CHAPTER – III

PHYSIOGRAPHIC FEATURES

1.0 Introduction:

The landuse structure, its evolving pattern and changes are closely related to the physiographic factors in an area. These factors are more important for the state of Mizoram than the other areas due to its mountain topography which directly controls the process and forms of landuses. The NLUP also followed the criterion of selection of beneficiaries based on topographic factors of the terrain conditions.

Physiography includes the evolution of relief features, slope, drainage systems, soil forming processes and vegetal cover, which are interrelated and have a complex features for the evolving land systems and landuse patterns. The study of these attributes of physiography would help in understanding the causes of landuse variations specially shifting cultivation patterns in the state and also helpful for evaluation the impact of NLUP on the changing scenario of rural society. The physiographic attributes of Mizoram are described here in the following manner.

2.0 Location and Extent:

Mizoram, one of the smallest states in India, lies in the Southern corner of the North- East India. It lies between 21°56' N to 24°31' N latitudes and 92°16' E to 93°26'

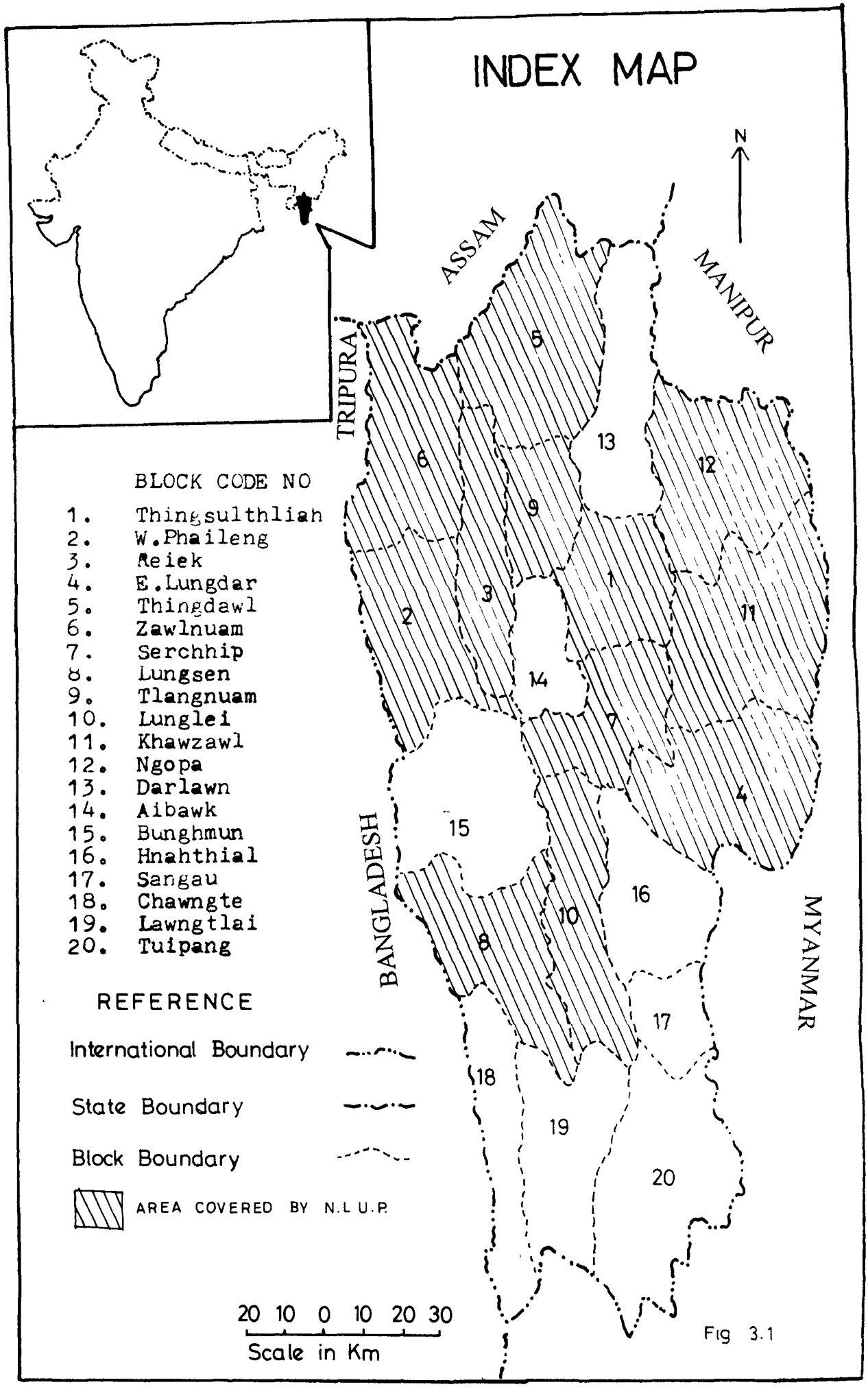
INDEX MAP
N
ASSAM
MANIPUR
TRIPURA
BANGLADESH
MYANMAR
BLOCK CODE NO
1. Thingsulthliah
2. W.Phaileng
3. Reiek
4. E.Lungdar
5. Thingdawl
6. Zawlnuam
7. Serchhip
8. Lungsen
9. Tlangnuam
10. Lunglei
11. Khawzawl
12. Ngopa
13. Darlawn
14. Aibawk
15. Bunghmun
16. Hnahthial
17. Sangau
18. Chawngte
19. Lawngtlai
20. Tuipang
REFERENCE
International Boundary
State Boundary
Block Boundary
AREA COVERED BY N.L U.P.
20 10 0 10 20 30
Scale in Km

Fig 3.1

E longitudes covering a geographical area of 21,081 sq. km. (Pachuau, 1994, p. 23) Being located between Myanmar and Bangladesh, it has a good extent of international boundary with these two countries. Near about 306 km of International boundary with Myanmar in the East and South, and with Bangladesh it was 123 km in the West The state is bounded by its neighbouring states in the South and West and shares a total common state boundary of 284 km with its three neighbouring states, viz.. - Assam (123 km), Tripura (66 km) and Manipur (95 km) (Lianzela, 1994). Mizoram has a total geographical area of 21,081 sq. km. and its maximum dimension is 285 km in North to South direction, and 115 km in East to West direction. The Tropic of Cancer passes through the middle of the state and this imaginary line divides the state into two almost equal parts (Pachuau, 1994). There are 20 R.D. Blocks in Mizoram (Fig. – 3.1).

(a) ***Relief Features:***

Being an end part of Himalayan foothills, Mizoram is characterised as hilly and mountainous rugged topography with high mountain ranges trending North to South direction. The mountain ranges are separated by narrow deep gorges and rivers. The elevation varies minimum from 40 metres at Bairabi to a maximum of 2,157 metres at Phawngpui. Generally, the Eastern part of the state has high elevations with steep slopes, large escarpments and sharp features of mountain ridges than the Western part (Fig. – 3.2). As a mountainous topography, there are only few small patches of flat lands comprising about 1.36 percent of the total geographical areas (Thansanga 1999). The development of terrain of Mizoram is young and immature and

is still under-going denudation in response to various exogenetic processes. Most of the geographical areas are covered by steep slopes, ridges and dissected low hills. One notable feature observed in Mizoram is that the Western slope of the mountain ranges have higher steepness of slope than the Eastern slopes. Running water is the most dominant process in evolution of landforms and is operating from upper tertiary period onwards till today.

The geographic landform of Mizoram can broadly be classified into two main categories according to the relief features, drainage and structural set up. *Tlawng* and *Mengpui* rivers classify it into two as:

1. The Eastern Mountainous Region, and
2. The Western Ridges and Valleys.

1. *The Eastern Mountainous Region:*

This area covers the Eastern half of the state and the overall elevations are higher and the slopes are much steeper than the Western half. The altitude of this area range from 400 to 2157 m. with an average elevation of about 1500 m (Pachuau 1994). The mountain ranges are aligned mostly in North - South direction. All the important peaks and mountain ranges in Mizoram are located in this part and can be described as follows:

In the North-East corner bordering Manipur and Myanmar runs the *Sialkal* Range. The highest peak of this range is Lengteng, the second highest peak in Mizoram stood at 2148.8 m. above sea level. The other high peaks are *Naunuarzo* (2140 m.) and Sur (2015.6 m.) which claim the third and fourth peaks in Mizoram. The other important ranges are *Mawmrang*, located in the midst of *Chalfilh* and *Sialkal* range in Aizawl District, *Hmuifang* range in the central part of the region, *Phawngpui* (2157 m.) the highest peak in Mizoram located in the Eastern part of *Chhimtuipui* District. The other conspicuous peaks in this region are Zopui (1963.2 m.), Lurh (1935.4 m.), Tan (1926.3 m.). Chalfilh (1904.6 m.), Ngur (1895 m.), Tawi (1889.7 m.), Lungrang (1861.4 m.), Hrangturzo (1854.3 m.), Mawmrang (1812.3 m.), Lenhlingzo (1717 m.), Thaltlang (1694.4 m.).

Due to the over-all structural and lithological control on the drainage, the rivers flow either towards North or South. The width of the valleys increase towards both ends on North and South. In spite of mountain terrain topography, it also includes two main interpiedmont plains which are situated in the Eastern side, namely, Champhai plain, bordering Myanmar in the East has a length of 11.27 km. and its widest part is 4.83 km. across, and plain of North Vanlaiphai in the South Eastern corner of Aizawl district. There are numerous small flat patches like *Tuisenhnar, Zawlpui, Thenzawl,* and small plains of *Hortoki* and *Bairabi* situated along the river *Tlawng.* Most of them are intermont valley plains located in the midst of hills and narrow valleys. They are

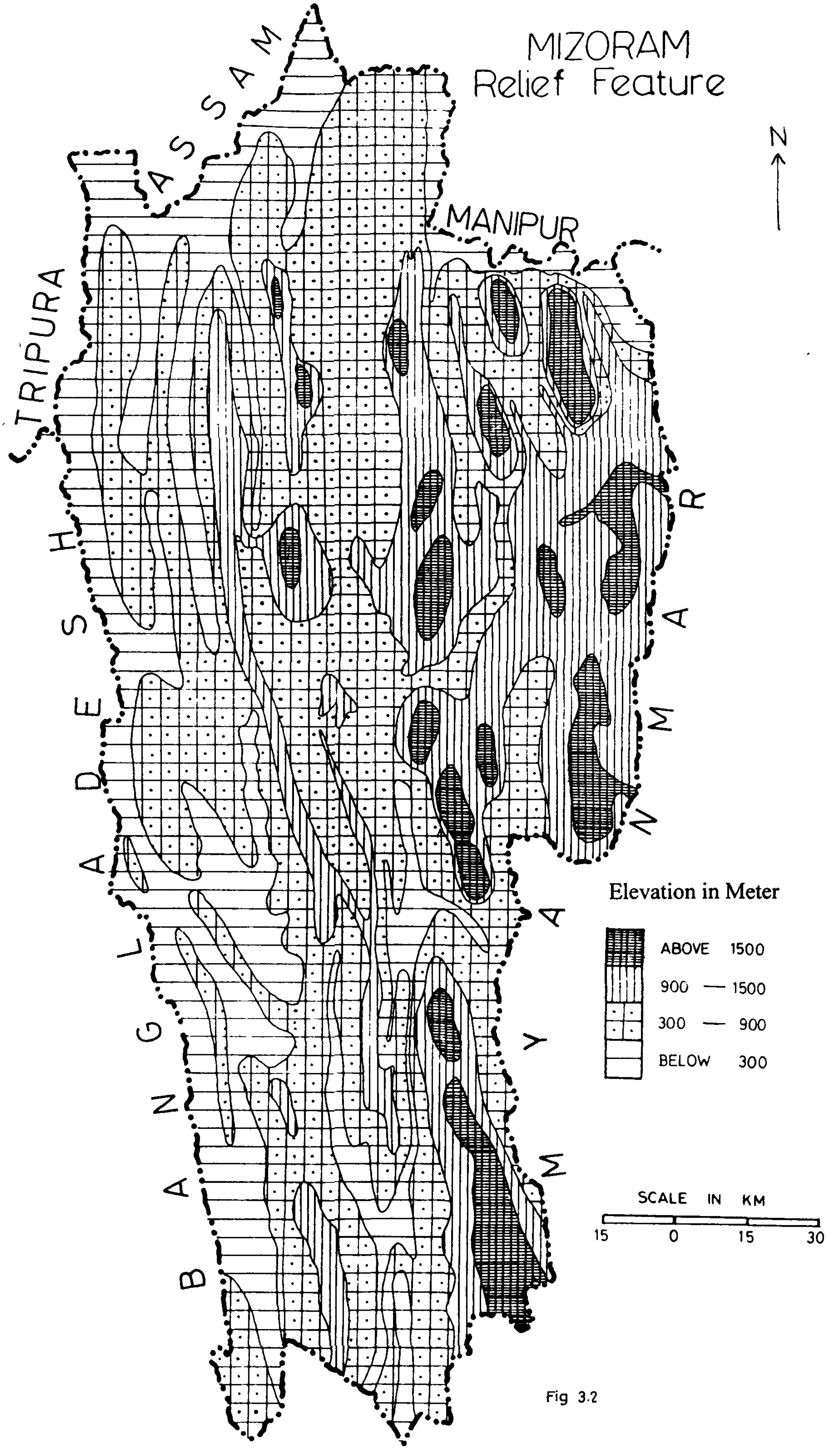
MIZORAM
Relief Feature
N
ASSAM
MANIPUR
TRIPURA
BANGLADESH
MYANMAR
Elevation in Meter
ABOVE 1500
900 — 1500
300 — 900
BELOW 300
SCALE IN KM
15 0 15 30

Fig 3.2

believed to have been formed in the beds of silted-up lakes as they are covered by rich alluvial soils.

2. *The Western Ridges and Valleys*

The Western part of Mizoram is characterised by ridges and valleys type of topography. Nearly half of the geographical area of the state is covered by this unit. The relief in this unit varies from 40 m elevation to 1550 m, and the average elevation is about 700 m. The altitude is low in the Western part and rises higher towards the Eastern part. Unlike the Eastern mountainous region, the mountain ranges are inclined NNW - SSE and NNE - SSW. The range are higher in the central part and tapering towards North and South.

The slopes are generally steep on the Western side of the ridge, few notable mountain ranges are observed in this unit. They are various ranges, namely, the Reiek, the Mamit and the Hachhek Ranges. Some important peaks in this region are Hmuifang (1617.5 m.), Reiek (1481.7 m.) and Thorang (1385.1 m.). Few small patches of flat lands are located in this region such as Chamdur in the Western part of *chhimtuipui* District, *Phaisen* and *Chhimluang* in the Aizawl district.

3.0 Climate:

Being located in a tropical region, Mizoram enjoys a moderate climatic conditions. The weather is neither too hot in summer nor too cold in winter. The

region falls under two climatic regions (Gopalakrisnan 1991), viz., Cwa-Sub-Tropical monsoon, dry winter, and Cwb - Sub Tropical monsoon, mild winter, warm and humid summer. Sub-Tropical monsoon and dry winter (Cwa) covers Central and Southern Mizoram while Sub-Tropical and mild winter covers Eastern and Western Mizoram The whole region experiences South-West monsoon and receives an adequate amount of rainfall.

The climatic conditions of Mizoram can be studied from its various elements, namely, temperature, rainfall and seasons.

3.1: ***Temperature***

Since Mizoram is located in the tropical region, it experiences neither too hot nor too cold. The salient thermo-characteristics of the region is that temperature do not fluctuate much through out the year, excepting in the low lying valley sites. The highest temperature is observed during May - July and minimised in December and January.

The average temperature of the region varies from 10.9°C to 23.6°C in winters and 20.9°C to 31.9°C in summers. By taking observation at Block level, the minimum winter temperature is experienced in Sangau Block with 3.9°C, and maximum temperature is found in Lunglei R.D. Block with 30°C (Government of Mizoram, 1995). Hoar frost is reported during winter in eleven R.D. Blocks, viz., - *Serchhip,*

Ngopa, Sangau, E Lungdar, Hnahthial, Thingsulthliah, Reiek, Khawzawl, W.Phaileng Zawlnuam and *Chawngte* blocks (Government of Mizoram, 1991, 1995 a,c,d,e, 1996, 1997 a,b,c,d,e).

3.2: ***Rainfall:***

The whole state is under the influence of South-West monsoon and receives adequate rainfall. It rains heavily from the month of May to September. Normally, June to August are the rainiest months (Ray 1993, p. 8). November to January are the driest months. The highest rainfall (i.e., 603 cm.) was recorded in Mizoram in the month of July 1983 (Pachuau, 1994, p. 43). As recorded by Soil Survey Organisation, Department of Agriculture, Mizoram, the region received 2,707 mm rain annually with an average of 155 rainy days. The following Tables reveal the rainfall data of three stations, viz., - Aizawl, Lunglei and Saiha for the period of 1996-97.

Table-3.1: Rainfall and Number of Rainy Days at three Stations.

(1) ***Aizawl Station***

Months	J	F	M	A	M	J	J	A	S	O	N	D	Total
Rainfall (mm)	19	66	146	125	283	259	773	259	397	102	21	83	2,533
No. of Rainy Days	1	3	8	12	12	13	28	17	21	7	2	3	127

(2) *Lunglei Station*

Months	J	F	M	A	M	J	J	A	S	O	N	D	Total
Rainfall (mm)	16	16	269	152	493	1,122	1,599	542	596	-	29	38	4,872
No of Rainy Days	2	2	9	8	20	27	30	28	25	-	4	4	160

(3) *Saiha Station*

Months	J	F	M	A	M	J	J	A	S	O	N	D	Total
Rainfall (mm)	4	6	109	75	113	426	852	244	429	59	17	55	2,388
No. of Rainy Days	1	1	6	6	6	20	29	25	24	5	4	3	130

Source: Calculated from Daily Rainfall Data recorded under Agriculture Department of Mizoram (in mm.) – Statistical Abstract, Department of Agriculture and Minor Irrigation, Mizoram, 1996-97, Published by Directorate of Agriculture, Mizoram, Aizawl.

Precipitation is heavy in summers and it brings down the range of temperature in summer season. Small amount of rainfall is received in winter season from North-East, generally known as retreating monsoon.

3.3: ***The Seasons:***

Based on the variation in temperature and weather conditions, climate of Mizoram can be observed as –

1. The cold season or winter (November to February)
2. Warm season or spring (March to May)
3. Rainy season or summer (May to September/October)

1. *The cold season or winter.*

The cold season starts from November or end of October and lasts till February. During this season, the region receives very less rainfall but the temperature is comparatively lower than spring and summer seasons. The average temperature of this season varies from 10.5°C to 23.6°C. But in some areas the temperature goes down to 3.9°C in the month of January (Government of Mizoram, 1995 p. 4). The season is very pleasant with clear blue sky in the absence of cloud cover. Morning mists and fogs are common upon the valleys during the season which give an enchanting view resembling a wide stretches of ice-sheets. Hoar frost is reported in some places during this season.

2. *The Warm Season or Spring:*

This season begins from March and lasts till May. The temperature varies from 19°C to 35°C in this season. The temperature has been declined at the end of the season due to the coming of rainy season. Less rainfall and maximum insolation due to clear sky caused high temperature.

3. *The Rainy Season or Summer:*

This season starts from the month of May and lasts till late October. It is characterised by the South-West Monsoon. The season starts with violent storm which swepts the state from South-West through Bay of Bengal, making the beginning of monsoon rains. The out break of monsoon is associated with the sub-continental low

pressure system and the consequent Northward movement of the zone of Inter-Tropical Convergence. The South-West monsoons blow into the region at an elevation of 4 to 5 km above sea level.

Rainfall is heavy from the month of May to September. The months of July and August receive the highest precipitation, i.e., about 135 cm. The heavy rainfall which start normally in the morning are sometimes associated with hailstorms and thunder. This is the season when cyclonic rains are often felt. The temperature remains high, but it is kept down to a considerable extent by the heavy rainfall.

4.0 Drainage Systems:

Physical features of landscape play a vital role in the drainage system in Mizoram. The state of Mizoram receives a considerable amount of rainfall during summer, and most of the streams are ephemeral in nature. While they swell during monsoon season their volume is very limited in dry season and many of them are dry up in dry season. Most of the rivers originated in the central part of the state and flow towards North or South direction due to the arrangement of mountain ranges and valleys. The river valleys are narrow and curved deep gorges at various places. The upper courses of rivers are often intervened by waterfalls. As the drainage system follows the trends of ridges and valleys, the trellis, dendritic and parallel drainage pattern are common in the state (Fig.-3.3).

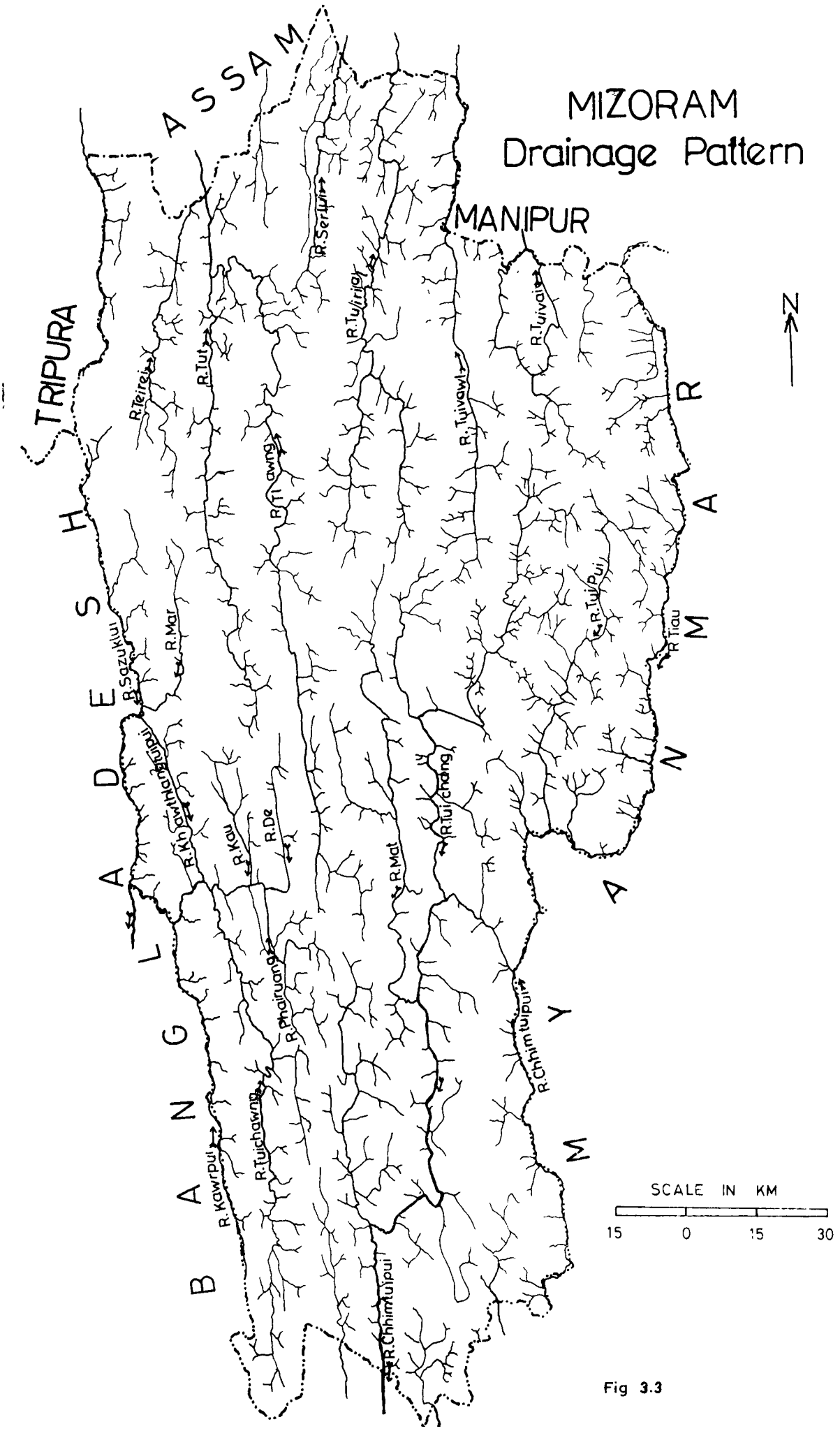
MIZORAM
Drainage Pattern
ASSAM
MANIPUR
TRIPURA
BANGLADESH
MYANMAR
N
R.Teirei
R.Tut
R.Serlui
R.Tuirial
R.Tuivai
R.Tuivawl
R.Tlawng
R.Sazuklui
R.Mar
R.Khawthlangtuipui
R.Kau
R.De
R.Mat
R.Tuichang
R.Tui Puii
R.Tiau
R.Phairuang
R.Kawrpui
R.Tuichawng
R.Chhimtuipui
SCALE IN KM
15 0 15 30

Fig 3.3

The drainage system in Mizoram can be divided into two broad parts according to their directions. The Northern portion of the state is drained by Tlawng, Tuirial, Teirei, Langkaih, Tuivai, Tuivawl, Tut and their tributaries. The rivers originated in the central part and flow towards the South are Tiau, Mat, Tuichang, Chhimtuipui, Khawthlangtuipui, Tuipui, Tuichang and their tributaries. The major drainage system in Mizoram can be described as follows-

1. ***Tlawng Drainage System:***

Tlawng - the longest river in Mizoram flows about 102 km. inside the state. It originates from Zopui Hill, about 104 km. East of Lunglei town. Flowing towards the North, it divides the state into two almost equal parts. Two rivers, the Tut and Teirei, join from the Western side and after this, Tlawng river enters into the Cachar District of Assam state where it is known as *Dhaleswari.*

The river is considered as the most important channel of water transport in Mizoram because the river is navigable by small boat throughout the year. The other two important rivers of this drainage system - Tut and Teirei, originate at Thorang tlang and North of Saithah village. They flow in parallel with Tlawng river for about 60 and 40 km.

2. ***Tuirial Drainage System:***

The river Tuirial originates from North of Chawilung Hill in Aizawl District and flows Northward and join Barak river in Assam. It is also navigable by small boat to a considerable length. This river span inside the state is about 67 km. Another important river in the drainage system is Tuirini which originates from the Eastern side of Baktawng village, after flowing parallel to Tuirial river about 30 km.; it joins Tuirial river from the Eastern side near the Tuirini kai village. In addition to these two rivers, there are small streams and rivulets forming the dendritic pattern within this drainage system.

3. ***Tuivawl Drainage System:***

Tuivawl river originates from Thentlang village in Serchhip District. It flows towards the North with its tributaries and joins Tuivai at the Manipur border and later joins Barak river in the Manipur State.

4. ***Tuivai Drainage System:***

The Tuivai river rises from Mawmrang tlang and flows towards the North. Its tributary Tuiphal river originates from Vapartlang near the Eastern border of the state joins the main river at the East of Luangpawn village. The Tuivai river flows towards the North and joins the Tuivawl river at the Manipur border, and later, confluents with Barak river in Manipur.

5. ***Tiau Drainage System:***

The Tiau river forms a clear demarcation line between Mizoram and Myanmar. The river rises from the North East corner near Khuangphah village in the Champhai District. The river flows towards the South and spans about 83 km. After confluence with many tributaries, it meets Chhimtuipui, which rises from Myanmar and flows in an opposite direction. This point gives quite an interesting scene as the two currents encountered with an opposite forces.

The most important tributary of this river is Tuipui which rises from the South of Champhai town. Initially, Tuipui river flows towards the North and later takes a Southward direction and joins the main river at the Myanmar border.

6. ***Chhimtuipui Drainage System:***

This system drains the South-Eastern part of Mizoram. The main river Chhimtuipui is the biggest river in Mizoram by volume. The drainage system is formed by Tuichang, Mat, Mengpui main rivers and their tributaries. The Chhimtuipui river rises from the Western part of Myanmar near Vanum village and flows in Southward direction. It enters into Mizoram near Chapui village and changes its course towards the North forming clear demarcation line between Mizoram and Myanmar.

Tuichang river originates from the West of Tualpui village flowing towards the South and meets Chhimtuipui near the Hnahchang village in Lunglei district. The Mat river rises from the middle part of Mizoram near the Baktawng village and flows towards the South. It confluences the main river at Vartekkai village on the boundary of Lunglei and Saiha Districts. Mengpui river rises near the Kawrthindeng village in the boundary of Lawngtlai and Saiha Districts. After confluence with its tributaries, the Chhimtuipui river flows towards the South.

7. ***Khawthlangtuipui Drainage System:***

This drainage systems formed by Khawthlangtuipui and its numerous tributaries such as (a) the Kawrpui which rises from the South-West corner near Andermanik village, (b) the Tuichawng which rises from the South-West corner near Bendukbanga village, (c) the Phairuang originating near S. Tlangkhang village and flowing towards the North, (d) the Kau rising from the Southern slope of Thorangtlang, and (e) the De which originates from Eastern part of West Bungtlang village flowing towards South. The main river Khawthlangtuipui rises from the valley located between Thaidawr II and Tuipuibari I villages and takes it course towards South forming border line between Mizoram and Bangladesh. After taking about 105 km. Course, it turn towards South-West entering Bangladesh. This drainage system shows rectangular and parallel drainage pattern. The main river is navigable by boat.

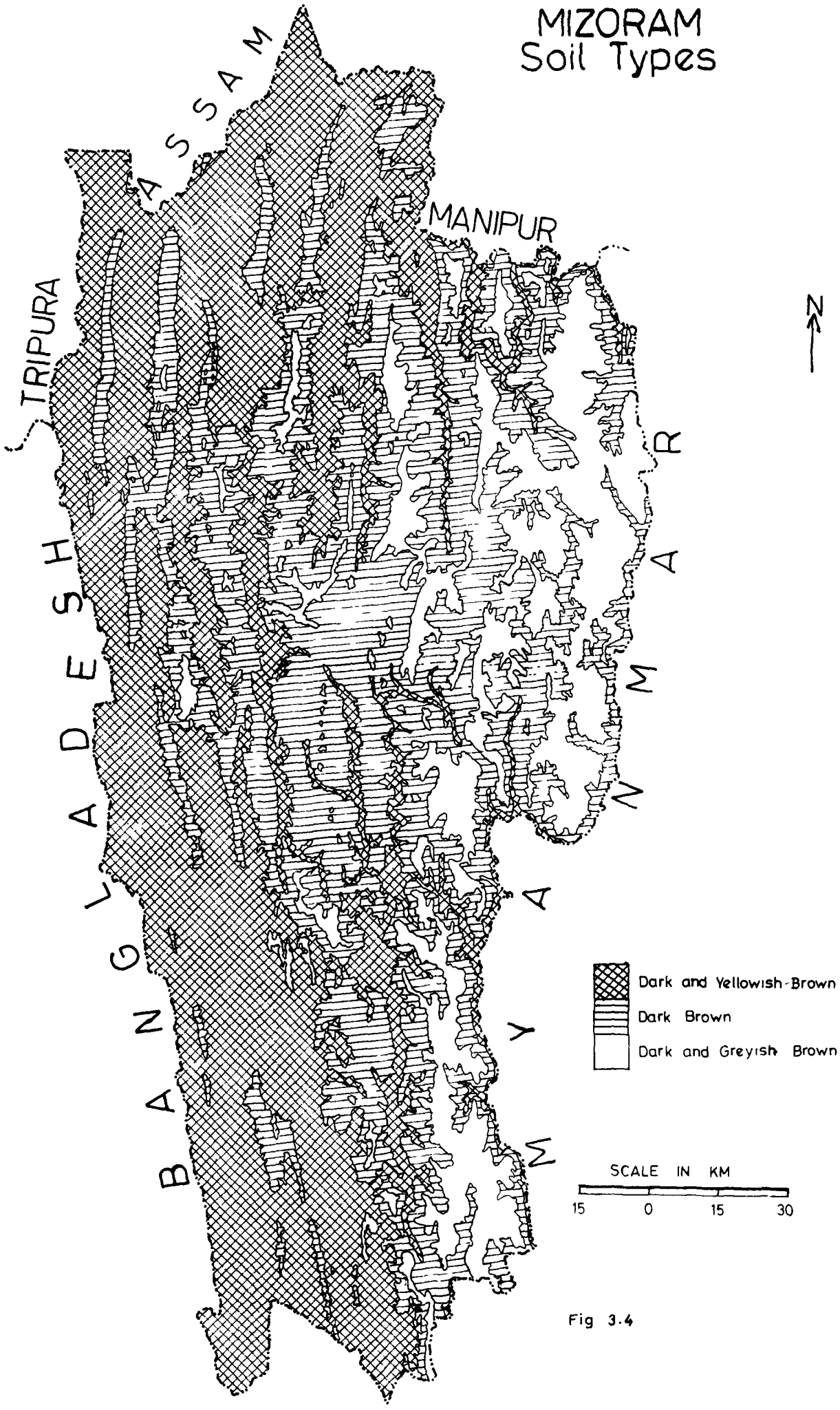
MIZORAM
Soil Types
ASSAM
MANIPUR
TRIPURA
BANGLADESH
MYANMAR
N
Dark and Yellowish-Brown
Dark Brown
Dark and Greyish Brown
SCALE IN KM
15 0 15 30

Fig 3.4

Following the ridges and ranges. the whole Mizoram drainage system delineates parallel drainage pattern. Small tributaries of the main drainage systems formed Trellis drainage pattern. The dendritic drainage pattern is also found in the Eastern side of the state.

5.0 The Soils:

As has been found, the formation of soil is a function of five major factors, that are. climate, vegetation, relief, parent material and time. It can also be stated that the formation of the soils depends upon the action of climate and organisms over parent material controlled by relief over a period of time. By understanding this, soils of Mizoram may be described into the following broad categories which are given by Lianzela (1994) (Fig.-3.4).

1. *Cool and Temperate Zone with Montane Sub-Tropical Pine Vegetation-Hill ridges and steep side slopes:*

Strong brown to yellowish brown soils derived mainly from non-calcareous hard sand stones. They are shallow to medium in depth, clay loam, acidic, rich in organic matter but poor in phosphate and potash content.

2. *Cool, Montane Climate with Broad-Leaved Deciduous Vegetation-Hill Side Slopes:*

Brown to yellowish brown derived from sand stones, silt stones and shales. These soils are medium to deep, coarse to medium in texture, strongly acidic rich in organic matter, but poor in available phosphorous and potassium.

FORESTS TYPE

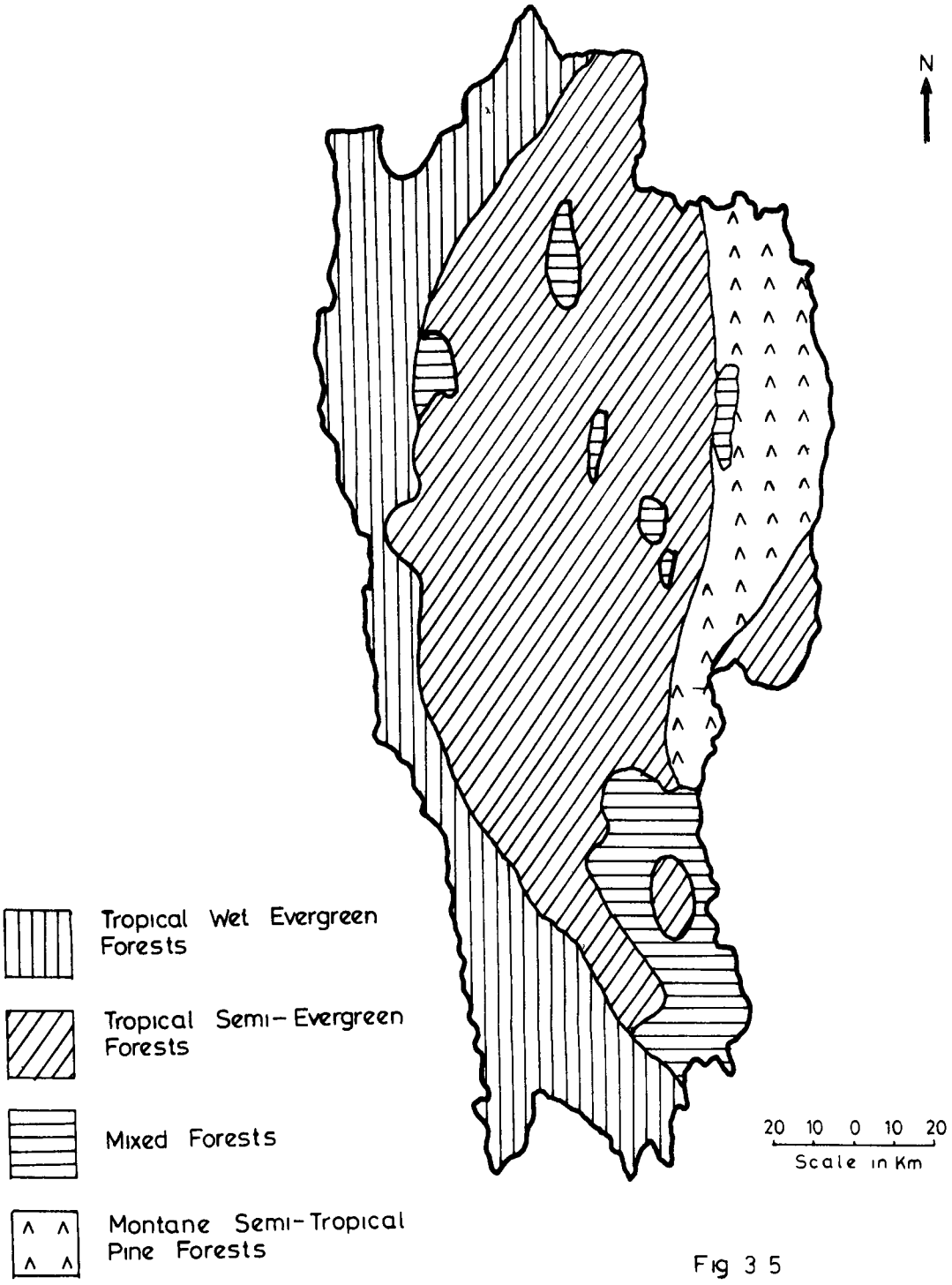

Fig 3 5

3. *Hot, Monsoon Rain Climate Rain with Mixed Vegetation.*

This soil occurs over the foot hills and are reddish brown to yellowish brown in colour. They are formed by colluvial action as characterised by a layer of boulders underlying the sub-soils. They are usually medium in texture, moderately acidic and rich in organic matter, but poor in available in phosphorous and potassium.

4. *Alluvial Soils:*

These comprise both old and recent alluvial soils which are formed by the fluvial action. These soils are deep to very deep, silt clay, slightly acidic and rich in organic carbon content. Available phosphorous and potassium varies from medium to low. This comprised the most fertile and productive soils of the state.

The above four categories revealed the general characteristics of soils in Mizoram as acidic, rich in organic matter, but available phosphorous and potassium are medium to low. These soils have direct bearings of agricultural practices in the state.

6.0 Vegetal Cover:

It is found that vegetal cover is highly depends on the edaphic, climate and biotic factors (Sagreiya 1967). The vegetal cover of Mizoram can be classified into three types, such as –

1. Tropical Wet Evergreen Forest mostly found in the South and Western part of the state where temperature and precipitation are high. And the area covered by this type of forest is generally lower in altitude.
2. Tropical Semi-Evergreen Forest which is formed in the middle part of the state. This type of forest is a closed high forest with large trees dominant, deciduous trees in some places, but canopy is less dense than the previous one, climbers and epiphytes are abundant while bamboo species is less.
3. Montane Semi-Tropical Pine Forest has been found in the Eastern part of the state where temperature and precipitation are recorded less, but altitude is higher than the others. Though there are many deciduous trees coniferous trees dominate this forest.

The above classification does not mean that there are clear demarcation line between them. Mixed forest and bamboo overlapping are found everywhere, this is due to the less changes of altitude, temperature and precipitation within the state (Fig.-3.5).

From the above statement of physical features, climatic condition, soil types and vegetal cover it is clear that the state has a suitable condition for agricultural activities and livestock rearing. But due to difficult terrain industrial development may face some problems.

7.0 Concluding Remarks:

Since physiographic factors of the state have direct bearings on agricultural systems which have been described here in detail, it is obvious to say that these factors

and the attributes of physiography are interrelated and formed the complex nature The areas of high hill tops and slopes have covered by forest and are inaccessible for agriculture. On down slopes shifting cultivation has been practised. On the other hand, the valley part where flat lands are available, the permanent cultivation has been practising. It is observed that physical factors are not only influencing but controlling the agricultural systems. Therefore, the primary sector dominates in the economy of Mizoram. The details of agricultural systems prevailing in such physiographic conditions may be interpret in the next chapter considering physigraphic attributes as factors.

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CHAPTER – IV

LAND CAPABILITY AND LAND USE

1.0 Land Evaluation and Land Capability Classification:

Land evaluation is an important base for landuse planning as well as evaluation of the performance of any land development programme. The procedure of land evaluation is long and has some important steps like –

(1) the land resources interpretation,
(2) the classification of land development,
(3) the land capability classes for the management of land uses and
(4) the soil surveys which are closely related to the quality and uses of land resources (Vink, 1975, pp. 295-346).

Various types of maps related to land quality, land limitation and land degradation (i.e., land erosion), which show this interrelated phenomenal features of land resources and the limitation of their uses, are useful in determining the landuse activities and identifying the optimal landuse pattern in any area. In fact, there are various criteria for optimising the landuse pattern. However, the criteria based on the physical parameters of land and its interrelated nature are the best for the suitability of landuses and its proper assessment.

Geo-Environmental Zones

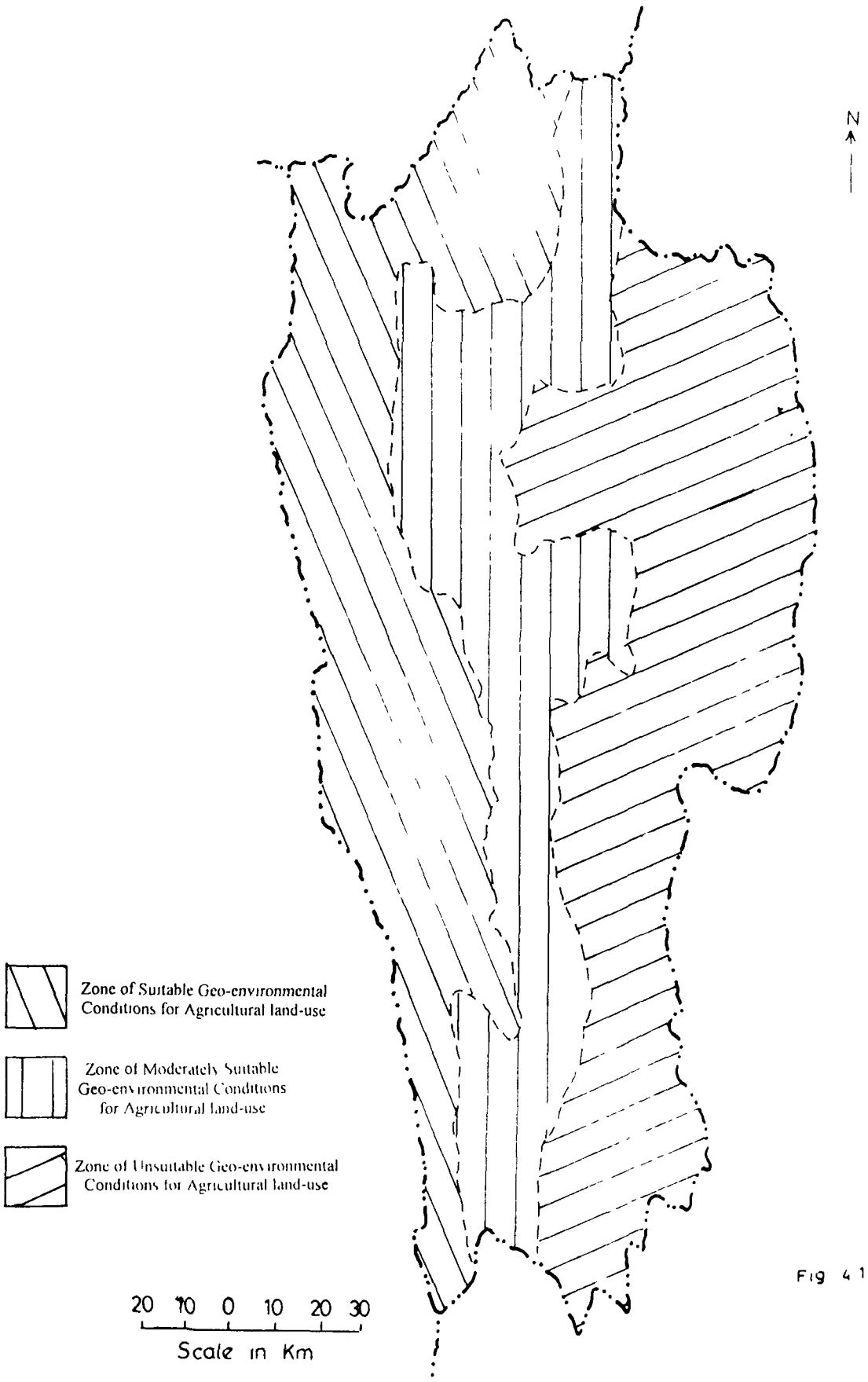

Fig 4.1

In the earlier Chapter of the present dissertation, physiographic factors of the landscape of Mizoram state have been interpreted in detail. A synthetic approach of 'areal differentiation' of the natural conditions of land may be useful to highlight the geo-environmental conditions of the land for its suitability for various landuses. A simple criterion of geo-environmental attributes and its related nature for the suitability of landuse has been adopted to understand the landuse characteristics in such conditions in the state. The following paragraphs reveal the general characteristics of geo-environmental zones in the state.

2.0 Geo-Environmental Zones:

On the basis of Geo-environmental factors like physiography, namely, terrain conditions, climatic, soil and geological set up, the state can be divided into three Geo-environmental zones. It is important to note that Geo-environmental zones are not similar to natural resource regions. Geo-environmental regionalisation is based on physical conditions while natural resource regionalisation is closely associated with physico-geographical attributes but is distinguished by socio-economic principles of delineation of regions by specific characteristics and by a great dynamism and changeability of boundaries.

The three Geo-environmental zones in the state are as (Fig.-4.1):

I. The zone of suitable Geo-environmental conditions for Agricultural Land-use.

II. The zone of moderate suitable Geo-environmental conditions for Agricultural Land-use.

III. The zone of unsuitable Geo-environmental conditions for Agricultural Land-use.

I. *The Zone of Suitable Geo-environmental Condition for Agricultural Landuse:*

This zone covers an area of 6,386.37 sq. km.. and six Rural Development Blocks are found within this region such as *Phaileng 'W', Thingdawl, Zawlnuam, Lungsen, Bunghmun* and *Chawngte*. All these blocks are located in the Western part of the state bordering Bangladesh and Assam. They are less rugged and lower in altitude.

Geologically, this zone has been formed from Tertiary deposit belonging to Surma group of Miocene and Oligocene age (Report on Soil and Land Capability 1991b,c;1995b; 1997b,c,d). The climatic conditions are favourable for agricultural system as it experienced Warm Humid Sub-Tropical climate and the average annual temperature ranges from 11°C to 34°C. It receives an adequate rainfall about 280 cm annually. The agricultural system needs such a sufficient precipitation because most of the crops are rainfed and irrigation is very less or negligible in this zone. The zone is drained by various rivers such as *Tlawng, Kau, Tuilianpui (Khawthlangtuipui), Sazuklui, Tut, Teirei, Mar Tuichawng, Kawrpui, Tuirial, Chhimluang, Langkaih* and their tributaries. Some patches of flat lands are also found along these rivers and are suitable for permanent cultivation. The drainage pattern in this zone is Dendritic, Sub-parallel and Trellis pattern.

II. *The Zone of Moderate Suitable Geo-environmental Conditions for Agricultural Landuse:*

The middle part of the state veiling seven Rural Development Blocks accounts for 6,411.14 sq. km is classified as zone of moderate suitable geo-environmental condition for Agricultural Land-use. The name of the blocks in this zone are - Reiek, Darlawn, Tlangnuam, Aibawk, Serchhip, Lunglei and Lawngtlai. The zone is also formed from Tertiary deposits belonging to Surma group of Miocene and Oligocene age (Government of Mizoram 1992b, 1993, 1995b,c,d, 1996a, 1997e). There is rugged topography and elevations are higher, but it is not difficult to practice agriculture in this zone.

The zone receives more rainfall than the other zones with an average rainfall of 285 cm annually, and the zone falls under Humid Sub-Tropical climatic region. The average temperature ranges between 8°C in winter and 35°C in summer. Though the climatic conditions and fertility of soil are still favourable for agriculture, the difficult terrain repudiate the development of Agricultural system. In short, this zone is less suitable for Agriculture in compare to the first one.

III. *The Zone of Unsuitable Geo-Environmental Conditions for Agricultural Landuse:*

The remaining seven Rural Development Blocks – E. Lungdar, Ngopa, Khawzawl, Tuipang, Thingsulthliah, Hnahthial and Sangau, are covered by this zone with an area of 8,289.49 sq. km. This zone is the largest among them and located in the Eastern part of the state bordering Myanmar and Manipur. The area is

characterised by hilly terrain and deep gorges between them. The parallel structural hill ranges of the area run North to South direction tapering at both sides with alternating narrow valleys. More than 36 percent of the area is suitable for forestry only. Except some patches of flat lands near the river valleys the remaining areas are only suitable for terracing, plantation and horticultural crops.

Like the other zones, this zone is also made up of Tertiary deposits from Surma group of Miocene and Oligocene age (Government of Mizoram 1995e,f, 1996b, 1997f,g,h,i).

The climatic conditions of this zone are Humid Sub-tropical having an annual rainfall of 249 cm. The rainfall is influenced by the S-W Monsoon which commences from April and continues upto October and the maximum intensity of rainfall is received during July and August.

The usual cultivation practice of the area is shifting cultivation which has led to a severe degradation of forests. As a result, the plants have been disturbed. The original plant species are replaced by bamboo like *Melocana bambusoides*, etc. Due to the more rugged topography, less rainfall and colder climate, this zone has unsuitable Geo-environmental conditions for agricultural land use.

3.0 Land Capability Classification:

The suitability of landuse may be judged by the capability of land in connection with its physical processes. The soil is most important attribute of land for assessing its capacity. In order to establish the capacity of soil for different crops, the interactions of soil elements with the crop-yield may be studied. The cause-effect relationship between crop-yield and soil factors is a proper way for such studies. It will give the productivity assessment of soil. In the process of land evaluation, the capability of land is an important parameter which is based on the terrain, climate and soil conditions of a piece of land:

United States Department of Agriculture (USDA) designed land capability classification which is generally accepted. According to USDA classification, there are eight classes which are as follows –

Class I: Requires good soil management practices only.
Class II: Moderate conservation practices only.
Class III: Intensive conservation practices only.
Class IV: Reserved vegetation – infrequent cultivation.
Class V: No restriction in use.
Class VI: Moderate restriction in use.
Class VII: Severe restriction in use.
Class VIII: Best suited for wildlife and recreation.

3.1 *Land Capability Class in Mizoram:*

Land comprises all elements of the physical environment to the extent that these influence potential for land use. thus land not only refers to soil but also include the relevant features of geology. landforms. climate and fauna etc (Duet and Young 1981). Evaluation of land for landuse planning is very important for the development of land for agricultural purpose. The following factors like the nature of parent materials, colour, texture, structure, consistence. permeability, depth of the profile have a definite role to play in behaviour of the soil and its management. Landscape features like slope and erosion conditions may limit the safe and productive use of soils. The slope gradient and the length of the slope profoundly effect the rates of run off and soil removal and directly the amount of moisture absorbed by the soil. The influence of climate also affects soils classification. On the basis of these attributes, the area is classified under land capability classes of II, III, IV, VI, VII, and VIII (Government of Mizoram 1991b). And the land Capability classes are slightly differ from the classes made by David Deut and Anthony Young (Deut and Young 1981).

There are three broad bases of land evaluation such as qualitative evaluation. quantitative physical evaluation and economic evaluation: (a) the qualitative evaluation is one in which the suitability is expressed in qualitative term only, such as highly, moderately or marginally suitable, or not suitable for a specific use, (b) the quantitative physical evaluation is one which provides quantitative estimates of the production or other benefits to be expected, e.g., crop yields, beef or wool production.

rates of timber growth, recreational capacity, (c) the economic evaluation is one which include results given in terms of profit and loss, for each specified enterprise on each kind of land (David Deut and Anthony Young, 1981, p. 121). Soil Survey Organisation, Department of Agriculture, Mizoram, has made a study on land evaluation for landuse suitability. According to the study, the state is divided into the following classes –

Class II: Moderate Conservation Practices Only:

These areas are arable good lands. They have deep soils and are found to occur on nearly level to gentle slopping valley land. They are prone to slight erosion. The soils are found to have formed in layers of fine loamy texture derived from alluvial deposits. They are subjected to water logging during rainy season. Few patches remain wet throughout the year due to high water table. The surface soils are rich in organic matter. They are subjected to overflow. They required proper bunding and flood protection and cultivation with management of excess water and selection of crops adopted to wet conditions. Drainage improvement is also suggested to keep water table low. This category covers an area of about 46.962.50 ha., which is only 2.23 percent of the whole state.

Class III: Intensive Conservation Practices Only:

These area are suitable for cultivation and are found to occur on moderate slopping to strong slopping side, foot hills and valleys. They are very deep and

moderately eroded. The surface texture ranges from sandy loam to loam. They can be used for crops in good rotation. They are well drained with good moisture holding capacity. Though they are suitable for cultivation, precaution against permanent land damage through erosion is necessary Proper bunding and broad base terracing are suggested for those lands. Drainage channel and diversion drains should be provided to remove excess run-off. The total area of class III land is found as 61,831.00 ha., i.e., 2.93 percent of the geographical area of the state.

Class IV: Reserved for Vegetation and Infrequent Cultivation:

The lands fall under this category are fairly good suited for occasional or limited cultivation. They are deep to very deep and prone to severe water erosion. They are found in the moderate steep to very steep slope and ridges (complex slope) of hills and are well drained and well aerated. The top soils have loamy texture. For safe removal of excess water the area needed some conservative measures like bunching and terracing with proper drainage channel, diversion drains also recommended. The total area of land under class IV is recorded 1,67,392.25 ha., i.e., 7.9 percent.

Class VI: Moderate Restrictions in Use:

The soils are found to occur in steep to very steep hill side and dissected low hills. They are shallow to moderate steep and are severely eroded. The top soils are mainly loamy. They are not suitable for cultivation and are recommended for horticulture cropping with intensive soil and water conservation measures or pasture

land with controlled grazing by cattle They should always remain under vegetation cover. The area under this class is 10,44,547.00 ha., which is 49.53 percent of the total areas.

Class VII: Severe Restriction in Use:

They are found in very very steep to escarpment side slope of hills and hillocks. They are moderately deep to very deep. No cultivation on this land is recommended. Forest plantation in these area should be done along the contour as they are subjected to severe erosion. They may be used for forestry. The total area under class VII is 28.95 percent of the geographical area which represent 6,10,583.00 ha.

Class VIII: Best Suited for Wildlife and Recreation:

They are found in the area above 1,000 m. a.m.s.l., which are made up of very very steep side slope of hills or escarpments. The area under this class should be left only for wild life and permanent forest. The area under class VIII is 1,77,484.25 ha., which is 8.42 percent of the State.

4.0 Landuse:

Land resources play a vital role in landuse as well as the pattern. During the increasing pressure of population on land and ever growing demand of food and raw materials, there is an urgent need to use every piece of land properly, which calls for scientific, rational and economic planning for the use of land resources without

disturbing ecological or socio-economic balances of the area. In fact, land use is central to all dimensions of land problems and policies (Srivastava 1992). As it was mentioned earlier, types of land resources affect the types and pattern of landuse system in any area. Such resources like physical conditions, forest types, avaialbility of water, fertility of soils, etc. are the primary factors in landuse.

Land utilisation or land use systems in Mizoram are based on two broad categories - Forest cover and Agricultural land use.

4.1 ***Forest Cover:***

The state has the second highest percentage of forest cover among all the States and Union Territories (The Hindu Survey of Environment, 1998, p. 195). The area covered by forest can be divided according to the density. Dense forest and open forest. Dense forest covering an area of 4,438 sq. km. is defined as forest cover of trees with canopy density of 40 percent and above (The Hindu Survey of Environment, 1998, p. 195). Open forest - a forest trees with canopy density between 10 percent and 40 percent accounts for 14.427 sq. km. Beside these, scrub covers about 937 sq. km. The forest cover can be classified into three types, according to Champion and Seth, the forests in Mizoram are classified under the following types (Fig. – 4.1):

1. Tropical Wet Evergreen Forests,
2. Tropical Semi Evergreen Forests, and
3. Montane Semi Tropical Pine Forests.

Tropical Wet Evergreen Forests, which are found in South and West Mizoram has valuable timber species such as - *Dipterocarpus turbinatus, Artocarpus chaplasha, Terminallia myriocarpa, Amoora wallichii, Michelia champaca, Callophylum inophylum, Mesua ferrea,* etc. The other common trees in this type of forest are *Dipterocarpus macrocarpus, Terminalia chebula, Duabanga sonnaratioides, Syzyzgium cumini, Cinnamomum* species etc. Some types of bamboos like *Melocana bambusoides, Dendrocalamus strictus, Bambusa tulda, (Bambusa) pallidi, Teinostachium dulloa, Dendrocalamus giganta, Dendrocalamus hamiltonii* etc are found.

The common species in the Tropical Semi Evergreen Forest are - *Michelia champaca, Schima wallichii, Gmelina arborea, Toona cilliate, Chukrasia tabularis, Sterculia villosa, Sterculia colorata, Podocarpus nerifolia, Adina cordifolia, Bombax ceila, Dillenia* species, etc. Bamboos and Canes are abundant in this type of forest.

Montane Semi Tropical Pine Forest is found in the Eastern part of the region. The important trees are - *Pinus keseya, Quercus incana, Quercus serrata, Quercus semiserrata, Castanopsis hystrix, Schima wallichii, Prunus cerasoides, Myrica spp., Rhododendrons spp., Clerodendrons spp., Rhus spp., Arundinelia, Rubus spp.*, etc.

4.2 ***Agricultural Landuse:***

Mizoram is an agricultural state and most of its working population is engaged in agricultural activities. However, only 1.34.696.75 ha. (i.e., representing 6.38 % as classified) is suitable for agricultural land (Government of Mizoram, 1991 b.c; 1992b. 1993. 1995a.b.c.d.e.f; 1996a,b; 1997a,b,c,d,e,f,g,h,i). Within this cultivable land 1,29,634.00 ha. is under cultivation including horticulture crops (Government of Mizoram, 1998b). Area under different crops, production and yield are shown in Table– 4.1.

Table – 4.1: Area and Production of Principal Crops.

Crops	Area (in ha.)	Area (in %)	Production (MT)	Yield (qu/ha)
Paddy (Jhum)	46,691	36.01	59,520	12.69
Paddy (WRC)	21,423	16.53	51,286	23.94
Total of Paddy	68,114	52.54	1,10,806	16.27
Maize	8,260	6.37	16,499	19.97
Pulses	4,180	3.22	7,053	16.86
Wheat	22	0.02	11	5.00
Tapioca	478	0.37	6,956	145.52
Oil Seeds	7,946	6.13	8,060	10.14
Cotton	962	0.74	427	4.43
Tobacco	377	0.30	415	11.00
Sugarcane	1,252	0.96	7,488	59.80
Fruits	15,976	12.32	69,934	43.77
Vegetables	13,098	10.10	80,460	61.42
Spices	7,657	5.92	29,101	38.00
Plantation	1,312	1.01	532	4.05
Total	1,29,634	100.00	3,37,742	

Source: Final Area and Production of Agricultural Crops in Mizoram, 1997-98 (districtwise) and Final Area and Production of Horticulture Crops in Mizoram, 1997-98.

Due to the difficult terrain and absence of power and irrigation, only 1.75 percent of the cultivated area is under irrigation, i.e., 2,279 ha. (Government of Mizoram, 1998c). Like many other states, rice is the most important crop in Mizoram.

Land resources play an important role in determining man's economic, social and cultural progress, especially for the regions of underdeveloped economy. Owing to scarcity of other resources like minerals, power, etc., agriculture is the main occupation of the State (Lianzela 1994, Verghese and Thanzawna 1997). The agriculture system of the state can be classified into two, viz., Jhum or Shifting Cultivation and Permanent or Wet Rice Cultivation (Das 1990, Ray 1993) and in addition to these two, some writers have included horticulture as the third system of agricultural activities (Pachuau 1994, Lianzela 1995).

4.3 *Jhum or Shifting Cultivation:*

Jhum or shifting cultivation is the principal method of cultivation in Mizoram (Das 1990, Singh 1991, Ray 1993, Lianzela 1994, Lalrimawia 1995). The primitive form of agricultural system could be traced back to the earliest history of Mizoram and is still common in the state. Though jhum cultivation is very destructive, the people have no alternative means of sustenance to replace it. This practice normally involves the clearing of forests, bushes, etc. When trees were cut they were left to dry in the sun, and then burnt the debris in the month of March or April. The ashes of debris fertiled the soil, and after this, seeds are sown and different crops are grown together.

In jhum system, rice is the staple crop. and other cash crops and vegetables are supplementaries. Weeding is done twice or till the harvest. The harvest of the principal paddy starts in the middle of October and ends by the middle of December.

The jhum fields are normally located near the settlement areas and temporary as they are used only for one or two years. After the harvest, the land is abandoned and the same processes is repeated in adjacent forest areas. This practice of cultivation made the Mizos a migrating tribe (Lalrinmawia 1995). Though jhum cultivation is still common in the state, it has many disadvantages. The output is not commensurate with the input in the form of physical labour that is put in (Gabryal 1999). It highly depends on monsoon. In 1981, the heavy rain during the burning period creates a severe problem. Out of 65,000 ha, only 28,000 ha. was abandoned and 36,980 ha. was partially burnt. The other disadvantages of jhum cultivation are that it is a wasteful means of cultivation in terms of vegetation annihilation in the process, and in terms of yield, reduction of vegetation covers led to soil erosion, silting up rivers, loss of raw materials for industries, loss of soil fertility, etc.

Although jhuming is a destructive agricultural system, it seems that it is difficult to wipe out due to the rugged terrain of the state. People who practise are not ignorant to these evil effects of jhum cultivation. But under such conditions like difficult terrain, lack of power and technology, etc. Jhuming is the only practicable process (Das 1990). If alternative means of sustenance are available no body will

undertake the job which is tedious and arduous nature (Garbyal 1999, p. 44). It is true that terracing is a good alternative but it is costly, and where the soil is porous the terrace may not retain water and may, indeed, become useless for wet rice cultivation It is easy to lay down a programme of terracing but it is often extremely to carry out (Das 1990 pp. 146-147). A.G. McCall, the then Superintendent of Lushai Hills says "the method of agriculture (i.e., jhuming) is wasteful and extravagant, but until others can create a system which can produce equally reliable results, it is wiser for critics to exercise caution" (Call 1949, p. 31). Government is trying to control jhuming as far as possible. One of the first legislations passed by the Government was the Lushai Hills District (Jhuming) Regulation, 1954. After this regulation, the Pawi-Lakher Autonomous Region (jhum) Regulation 1956 and the Pawi District (jhum) Regulation 1983 were passed.

In the olden days, there was only jhum cultivation and nothing else. All the cultivated lands are under jhuming. The percentage of areas under jhum cultivation decreases after wet rice cultivation was introduced by the British administrators. Jhum cultivation covered an area of 65,000 ha. in 1981, 40,000 ha in 1984-85, it covers only 39,175 ha. in 1991-92 which has been increased to 43,652 ha. in 1996-97 and then to 46,691 ha. in 1997-98. Apart from the main jhum fields, every household has a small field generally near the house or at the bottom-end of the jhum, where vegetables or maize are grown. This is like a kitchen garden which provides some food with much less care than what is required for a regular jhum. Jhum cultivation is

less productive in compare to permanent or wet rice cultivation. According to the Department of Agriculture, Mizoram. 1997-98. jhum cultivation yields only 12.69 qu/ha of rice while Wet Rice Cultivation (WRC) produced 23.94 qu/ha of rice.

The historical perspective of change in landuse form jhum to Wet Rice Cultivation is a symbol of transformation which is slow but significant. It may be because of two factors: increasing demand of staple food that is paddy and the differentiation in its yield. Thus, jhum cultivation on slopes is changing its pattern. Another agricultural system of the area is Permanent Cultivation which is interpreted in following manner.

4.4 *Permanent or Wet Rice Cultivation:*

At the end of the 19th century, the British Government tried to introduced Wet Rice Cultivation and wean away the people, as far as possible away from jhum cultivation (Das 1990). Colonel Shakespear, the first Superintendent of the Lushai Hills took steps in 1898 to introduce Wet Rice Cultivation in Champhai Valley.

In 1909, Major Cole laid down rules about allotments of Wet Rice Cultivation. The main features of the rule are as follows –

(1) So long as a man lived in one of the established hamlets without jhuming, his right to Cultivate Wetland was hereditary, provided it could not be established that the

field has remained fallow two years in succession. when all such rights were automatically extinguished.

(2) If a man migrates to another jhuming village. his rights were automatically extinguished and the fields lapse with his house to the chief.

(3) If a field owner died without heirs. his holdings lapse to the chief. If he left an heir, the heir has choice of taking over house and field of the diseased or abandoning it is favour of the chief, free of all charges to the chief, for resettlement under these rules.

(4) Every villager was due to pay *Fathang* to the chief within whose boundaries he cultivated field upto a maximum of six kerosene tins per year and no more. *Fathang* was not clamable for *Leipui* or cotton or vegetable cultivation.

During the British period, Wet Rice Cultivation settlements were made in Champhai, North Vanlaiphai and Tuisenhnar. Champhai, the biggest plain in Mizoram has a length of 11.27 km and the widest part is .83 km across (Pachuau 1994). Permanent cultivation, though providing a better yield covers a small portion in agricultural land. It covers only 16.53 percent while the less productive jhuming covers more than 36 percent of the total cultivated land (Government of Mizoram, 1998a).

The Agriculture Department divided permanent cultivation into Wet Rice Cultivation (*Rabi and Kharif*) and High Yielding Variety (HYV). In 1997-98, WRC (Rabi) covers an area of 1,130 ha yielding 24.73 qu/ha WRC (Kharif) covers 15,456 ha. producing 22.95 qu/ha HYV (early and late) covers 4,837 ha. with 26.89 qu/ha of yield.

In addition to rice which remains the most important crop in the state there are food crops and horticulture crops. These food crops like Maize, Pulses, Wheat, Tapioca, Oil Seeds, Spices (Ginger, Turmeric, Garlic, etc.) are also very important especially for the economy of the rural people. And the Agriculture Department tried to attain self-sufficiency in food grain production during the Sixth Plan (Lianzela 1994, p. 118).

Maize, even though it is not a staple crop for the people, it is the most important crop. But it never covers an area as large as paddy field and the yield is not so high compare to Potato, Spices and Horticulture crops. This crop yields 196.2 qu/ha in 1991 189.61 qu/ha in 1992, 182.67 qu/ha in 1993 and 182.77 qu/ha in 1994. In 1995, the state experienced a very heavy rainfall and landslides, most of the Maize crops were destroyed and the yield is recorded remarkably low with only 19.54 qu/ha. But in 1996 it reached its maximum as 8,547 ha and 375.19 qu/ha while the production of this crop has been decreased to 199.74 qu/ha in 1997.

Pulses include rice bean, arhar, pea, cow pea, french bean, lentil, black gram, green gram, etc. These crops are mainly confined to the Western part of Aizawl district. This area has warm-humid climatic condition with lower altitude than the other parts of the state. During the period of seven years (1991-1997), the Western part of the Aizawl district constitutes 25 percent to 45 percent of pulses cultivated

area. The yield is not so high and Aizawl East has the highest yield among five agricultural regions in 1991 (Government of Mizoram 1991a).

Oil seeds and spices are found every where in the state but is seems that oil seeds are not very productive as the yield per hectare is very low. Every year except 1997, yield per hectare is recorded about 90 qu/ha. There are many kinds of spices in the state, good quality of spices are grown in the state and there are some processing industries within the state (Colney 1995). In 1991, spices covered an area of 8,346 ha with 21.23 qu/ha, it reaches its maximum in cultivated areas in 1992 (11,190 ha) with 289.97 qt/ha of yield (Government of Mizoram 1992a). In 1993, the cultivated area of spices decreased to 4,255 ha and yields for this year was recorded 302.27 qu/ha. In 1994, it covered an area of 4,413 ha with 314.59 qu/ha of yield. In 1995, production of spices has been increased by 92.23 percent and yield per hectare is 458.42 qt/ha and the costs of some spices like ginger, chillies, etc. are increased and many farmers cultivated such kinds of spices in 1996 and the area under spices has been increased by 42.89 percent. But the price of spices went down within a few months, so, many cultivators abandoned their fields and yield is decreased automatically. The yield of spices was recorded 380 qu/ha in 1996 and 101.43 qu/ha in 1997 (Fig. – 4.3).

Horticulture crops occupied an important position in the state, and it can be further divided into two, such as fruits and vegetables. Vegetables as subsidiary crops of paddy remained important crops since the Mizos occupied the state and the yield

per hectare is very high during the last decade. Vegetable crops include tomato, cabbage, knon khol, turnip, radish, cauliflower, mustard, pumpkin, cucumber, brinjal, bitter gourd, snake gourd, ladies finger, carrot, squash, melon, capsicum, sweet potato, etc. During the period of 1991-1996, vegetable crops have a superior position in yield/ha in compare to other crops. In 1991, it covers an area of 6,767 ha with 649.13 qu/ha. Cabbage, mustard, pumpkin, cucumber, brinjal, squash, colacasia and sweet potato are the most successful crops at this time. Squash even though its cultivated area is limited (563 ha), it produced 19,959 MT, which means 356.5 qu/ha. Squash is mainly confined in Sihphir, Durtlang and Neihbawi villages of Tlanguam R.D. Block. The production of vegetable crops is remarkably high in 1992 as the cultivated area remains the same and it reached its highest yield per hectare with 779.09 qu/ha and squash remains the most prosper crop with 3,970.07 qu/ha. The production of vegetables has been increasing every year because of increase in its area. However, crop yield is recorded lower as 575.08 qu/ha. in 1993 and 614.00 qu/ha. in 1996. On account of decrease in area and yield of vegetables, its production decreased by 5,850 MT (44.66%) in 1991-1997.

Fruit crops include orange, lemon, hatkora, banana, pineapple, mango, papaya, peach and plum, guava, jackfruit, pear, litchi, tamarin, jamir, sisu, passion fruit, pumelo, apple, etc. (Government of Mizoram 1997a). Orange, hatkora, pineapple, banana, and passion fruit are some important crops among them. Fruit crops occupied the largest area except the paddy field, and the area has been increased every year at

Changes in Cropping Pattern

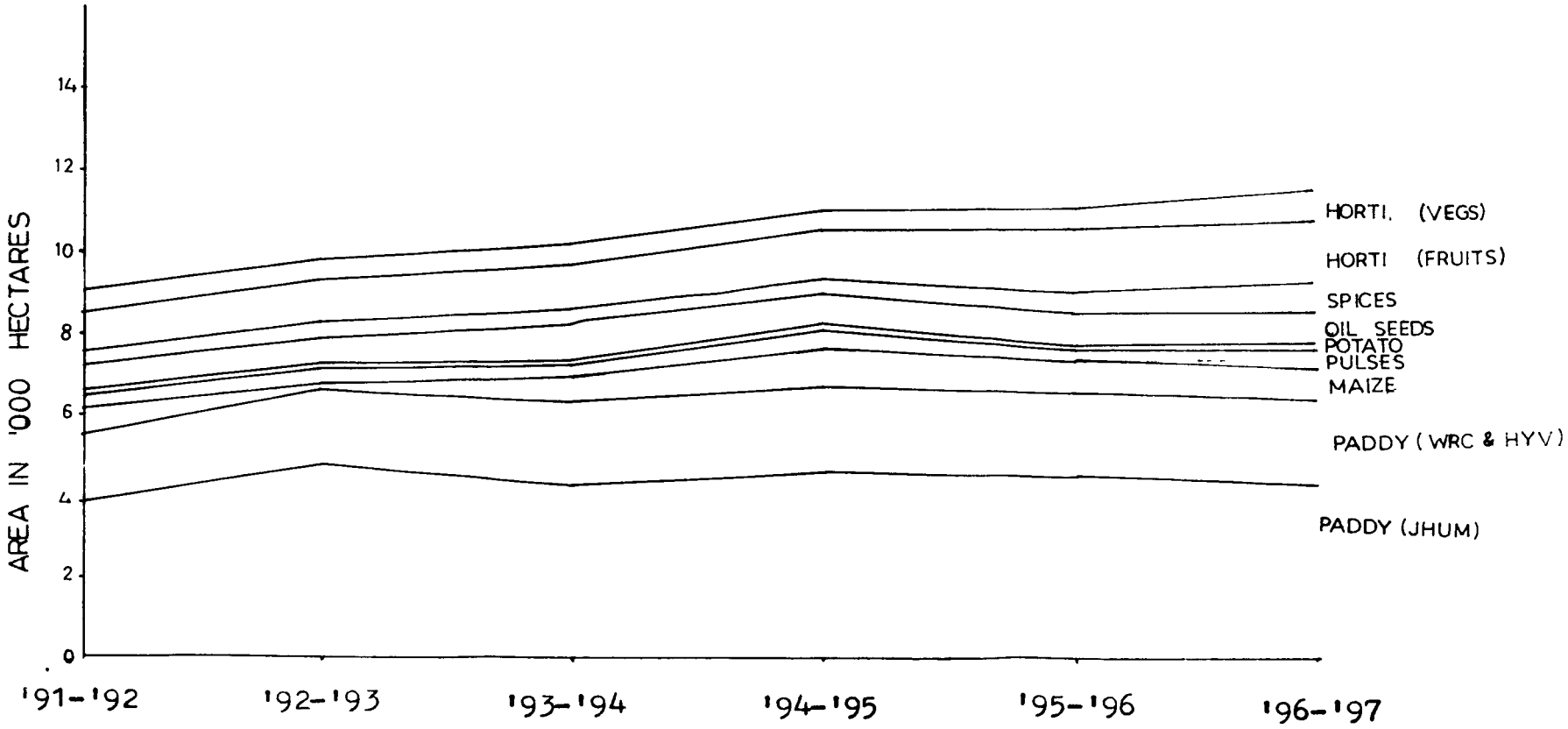

Fig 4.2

this period (1991-1996) and production is also gaining at the first five years. But in 1996. the production of fruits decreased by 3.32 percent. Though there are small changes in yield per hectare of fruit crops. it is very constant in compare to other crops. The following table shows the yield per hectare of fruit crops from 1991 to 1996 (Data for 1997 is not available).

Table – 4.2: Trend of Fruit Crop Yield.

Year	Yield/ha (in qu/ha)
1991	373.38
1992	427.62
1993	440.16
1994	434.72
1995	475.07
1996	437.74

Source: Final Area and Production of Horticulture Crops in Mizoram, 1991-96.

5.0 Concluding Remarks:

The nature, types and patterns of landuse in Mizoram have been described in this Chapter. Physical factors like terrain, climatic conditions and road accessibility played an important role in landuse. Among the landuse systems, forest cover is one of the best even in the country. But agricultural landuse, which is more important in rural economy of the state did not revealed a fruitful experienced the difficult terrain restrict the development of agriculture in the state. And within this agricultural landuse, jhum cultivation which is a primitive method and destructive to natural forests is very common especially in rural areas. Wet Rice Cultivation and some kind of horticultural crops are more promising for the development of rural economy.

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CHAPTER – V

NEW LAND USE POLICY (NLUP) AND ECONOMIC CHANGES

1.0 Introduction:

In the preceding Chapter, the general land use pattern and land capability classification have been described. It will give an understanding for the changes in economic sector in proper direction, through which the role of NLUP may be interpreted. A question about the contribution of NLUP to over all economic development in the state can be answered by studying the detail structural characteristics and patterns of economic Sectors in context with NLUP. The main sectors of economy are – (a) Agriculture and Allied Sector, (b) Animal Husbandry and Veterinary Sector and (c) Industry Sector. The temporal changes in these sectors with respect to changes in the beneficiaries of these sectors of economy may be able to explain the facts. Such changing nature and characteristics of these sectors would be analysed following 'topical approach' and later on correlations method is to be applied by assessing the impact of NLUP on different sectors of economy. Keeping these aspects in mind, this chapter is devoted to the following four aspects of economy:

1. The changing pattern of beneficiaries in various economic sectors.
2. Changes of agricultural landuse from the pre-implementation period (1990-'91) to post implementation (1997-'98) of NLUP, so that impact assessment may be interpreted.

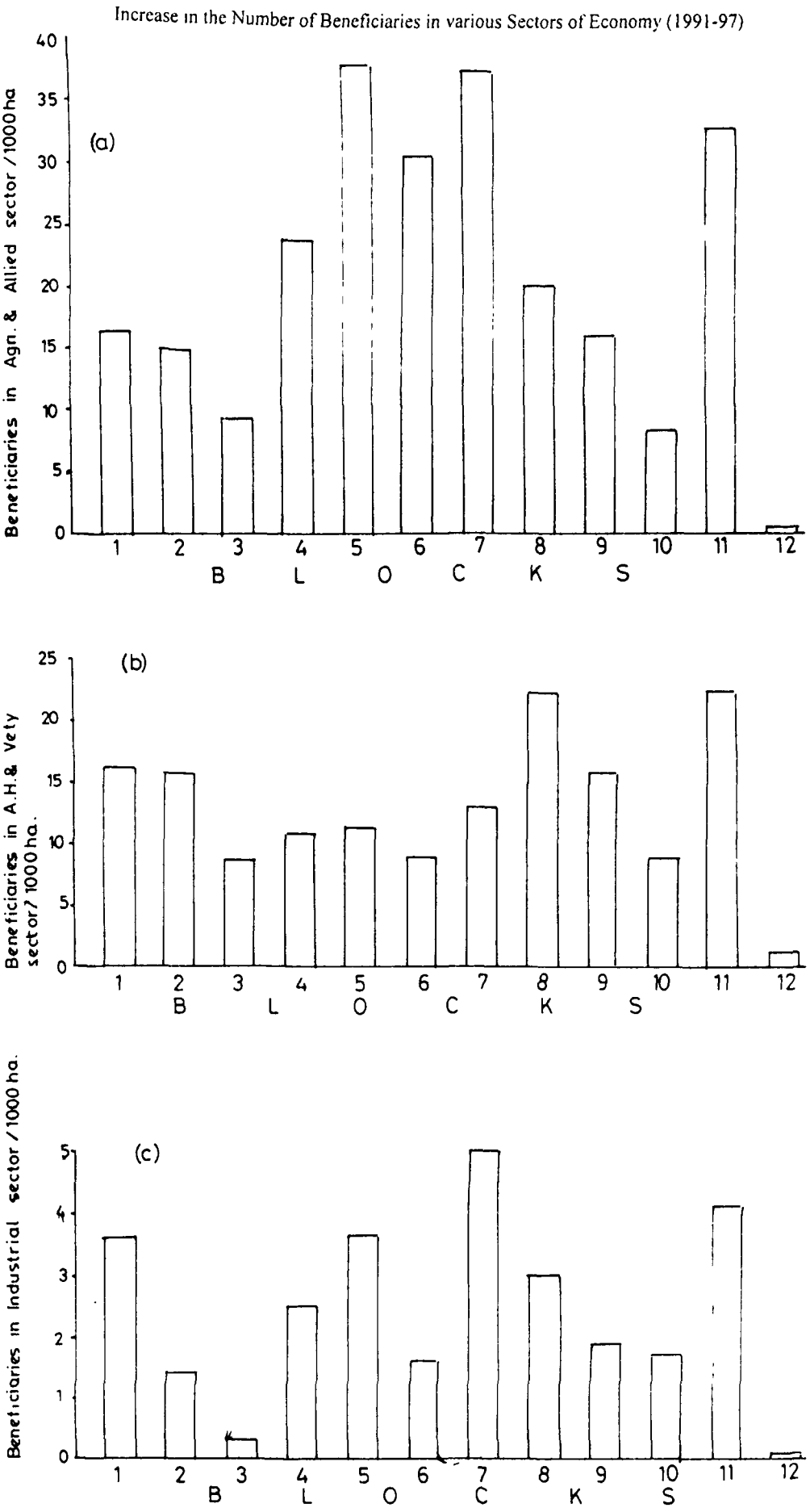


Fig 5.1

NB: For name of the Blocks, see fig. 3.1

3. The changes in overall volume and percentages in Animal Husbandry and Veterinary Sector during the same period of time.
4. The distributional pattern of Small Scale Industries in Mizoram, that is a sector influenced by NLUP in the state

Such important aspects of present discussion can be studied by compiling concerned statistics at Block level and correlating the facts of changes in various sectors in the economy as mentioned above. The details of the changing pattern of beneficiaries under NLUP and sectoral strength of the economy are described in following manner –

2.0 Changing Pattern of Beneficiaries in Various Economic Sectors:

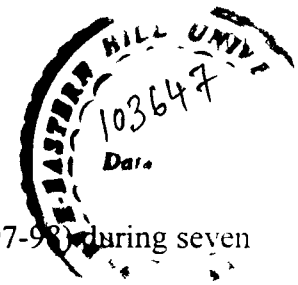
The three major sectors of economy, which are directly influenced by the NLUP, are considered to show the changes of beneficiaries there by.

Table-5.1: Increase in the number of Beneficiaries in various sectors of economy (1991-97).

Sectors	No. of Beneficiaries		Changes	
	1991	1997	Total	percent
Agriculture & Allied	13,590	27,469	13,879	102.07
Animal Husbandry & Veterinary	8,343	18,270	9,927	118.98
Industry	1,407	3,357	1,950	138.59
Total	23,340	49,096	25,756	110.32

Source: Abstract of Original Beneficiaries from 1990-91 to 1997-98.

The above table shows that the increase in beneficiaries under NLUP in different sectors of economy. There is a record increase of a total of 25,747



beneficiaries (i.e.. 110.32%) from 23,340 (1990-'91) to 49,096 (1997-98) during seven years of time of NLUP implementation. Agriculture is the most important sector in this scheme and it occupied 58.22 percent in 1991. Its share slows down to 55 percent in 1997. Till 1997, WRC and Tung plantation remained the leading trades under this sector and maximum beneficiaries are engaged in WRC and Tung plantation. As shown in the above table, the number of families assisted by the Government for this sector has been doubled during this period. Being major sector of the economy, the total number of beneficiaries has been recorded very high. However, percentage increase in this sector in only 102.07 percent which is slightly lower than the average. Next to the Agriculture and Allied Sector, Animal Husbandry and Veterinary is another important sector of this scheme. There were 8,343 beneficiaries in 1991 under this sector, which were increased to 18,270 till 1997. The moderate increase of about 118.98 percent is recorded in this sector. Thirdly, the industrial sector of economy where people are benefited records lowest number of beneficiaries, that are 1407 in 1997. However, its changes in this sector is recorded highest (138.59%) during this period (Table - 5.1). The total number of beneficiaries under this sector were increased from 1,407 in 1991 (which is only 6.02% to the total beneficiaries) to 3,357 in 1997 (which is 6.83% to the total number of beneficiaries).

Considering the scheme as a whole, the implementation of this scheme is very successful in all Sectors. All the beneficiaries in three Sectors were doubled during the

period of implementation of scheme. A Block-wise pattern of beneficiaries may give more details.

2.1 *Pattern of beneficiaries in Different Blocks:*

(a.1) *Strength of Beneficiaries in Agriculture & Allied Sector:*

There are 28 different trades under this sector such as-WRC, Orange, Lemon, Pine Apple, Sugar cane, Hatkora, Terracing, Tung, Pisciculture, Valencia, Mango, Citronella, Coffee, Tea, Banana, Passion fruit, Sericulture, Apple, Grape, Jamir, Kagzilime, Teak, Coconut, Betelvine, Betelnut, Horticulture, Gardening and Chow Chow. Among these, 28 trades, namely, Tung plantation, WRC and Orange are the important trades which more than 56.35 percent (that are 15,477 in number) beneficiaries are engaged.

Block-wise figures of beneficiaries distribution show that Khawzawl block accommodates the highest beneficiaries in this sector following Thingdawl block which are situated. The second largest number of beneficiaries is found in Thingdawl block (4,715). Orange, Hatkora and Betelnut are important trades in this block, and some trades like Tung, Terracing, Tea, Banana, Passion fruit, Sericulture, Teak, Coconut and Betelvine are having very less beneficiaries. Pine apple, Valencia, Mango, Citronella, Coffee, Apple, Grape, Jamir, Kagzilime, Horticulture, Gardening and Chow chow are not selected by the beneficiaries in this block. Thingsulthliah

block is mainly concentrated in Sugarcane. Tung and WRC trades. The 92.55 percent of beneficiaries are engaged in these three trades. The other trades found in this block are Terracing. Pisciculture, Sericulture, Teak and Horticulture.

Ten different trades are offered to W. Phaileng block, and more than 89 percent of Beneficiaries are condensed in WRC, Orange, Pisciculture, and Betelnut. The other trades selected for this block are – Hatkora, Terracing, Tung, Citronella, Teak and Coconut.

A total of 903 beneficiaries from Reiek block were assisted to take up 10 different trades under this Sector. But most of the beneficiaries are engaged in WRC, Orange and Hatkora trades and these three trades account for 84.49 percent to the total beneficiaries. The other trades found in this block are Lemon, Pineapple, Sugarcane, Terracing, Tung, Pisciculture and Sericulture.

E. Lungdar has the third largest number of beneficiaries in this Sector with 3,258 families. More than 92 percent of the beneficiaries are confined in seven trades while 17 different trades were found in this block. Those important trades are – WRC, Orange, Terracing, Tung, Pisciculture, Tea and Passion fruit. The other trades found in this block are – Lemon, Pineapple, Hatkora, Sugarcane, Mango, Banana, Sericulture, Apple, Jamir and Betelnut.

Table - 5.2: Block-wise Distribution of Beneficiaries in Agriculture and Allied Sector in Mizoram (as on March 1997).

Trade	Thingsulthliah	W Phaileng	Reiek	E. Lungdar	Thingdawl	Zawlnuam	Serchhip	Lungsen	Tlangnuam	Lunglei	Khawzawl	Ngopa	Total
WRC	179	208	223	698	599	485	700	897	129	297	840	262	5517
Orange	-	643	439	229	1208	960	572	2	115	144	83	31	4436
Lemon	-	-	11	1	117	30	19	-	7	5	3	-	193
Pineapple	-	-	10	16	-	49	381	-	-	21	4	3	484
Sugarcane	568	-	9	98	279	22	273	-	135	79	83	23	1569
Hatkora	-	66	101	2	1013	667	26	-	34	1	1	-	2079
Terracing	45	33	17	138	63	3	150	37	61	148	171	74	771
Tung	570	24	68	1205	47	-	471	-	143	166	2734	105	5533
Pisciculture	12	194	17	138	299	278	91	43	42	151	140	49	1454
Valencia	-	-	-	-	-	-	39	-	2	1	1	1	44
Mango	-	-	-	3	-	-	11	-	-	1	-	-	15
Citronella	-	17	-	-	-	-	18	-	-	-	-	-	35
Coffee	-	-	-	-	-	-	2	13	-	-	-	-	15
Tea	-	14	-	168	15	-	37	-	-	-	-	-	234
Vanana	-	-	-	13	10	-	101	-	47	212	15	7	405
Passionfruit	-	-	-	426	1	-	55	-	47	17	683	1	1230
Sericulture	5	-	8	46	32	5	14	3	-	24	10	4	151
Apple	-	-	-	69	-	-	-	-	-	-	8	-	77
Grape	-	-	-	1	-	-	-	-	-	-	15	-	16
Jamir	-	-	-	6	-	-	-	-	-	1	11	-	18
Kapziclime	-	-	-	-	-	-	-	-	-	-	6	-	6
Leak	3	-	-	-	2	76	-	-	-	-	-	-	81
Coconut	-	5	-	-	20	43	-	-	-	-	-	-	68
Betelvine	-	-	-	-	2	-	-	-	1	61	-	2	66
Betelnut	-	317	-	1	1008	437	-	-	-	1	-	-	1764
Horticulture	41	-	-	-	-	-	-	1071	-	-	-	-	1112
Gardening	-	-	-	-	-	-	-	-	-	13	-	-	13
Chow Chow	-	-	-	-	-	-	-	-	82	-	1	-	83
Total	1423	1521	903	3258	4715	3055	2960	2066	853	1343	4810	562	27469
Total Area (in ha)	89137	103576	97218	137220	125765	100763	90252	104630	54501	119470	163793	147319	18239 44
Beneficiaries per 000 ha	15 91	14 68	9 28	23 74	37 49	30.31	36.88	19 74	15 50	11 24	29 43	3 81	15.05

The third largest number of beneficiaries under this sector is found in Zawlnuam block (3.055). The important trades and their number of beneficiaries are as follow – WRC (485), Orange (960), Hatkora (667), Pisciculture (278). and Betelnut (437).

Out of 28 different trades only 17 trades are offered to Serchhip block. Some important trades in this block are WRC, Orange, Pineapple, Sugarcane, Terracing, Tung and Passion fruit. These seven trades account for 89.45 percent to the total beneficiaries.

Lungsen block received Government assistance through seven trades under the sector of Agriculture and Allied Activities. Most of the beneficiaries are concentrated in WRC (897) and Horticulture (1,071), and the other beneficiaries about 4.7 percent are engaged in Orange, Tung, Pisciculture, Tea and Sericulture.

The beneficiaries from Tlangnuam block are engaged in 13 different trades, and WRC, Orange, Sugarcane, Tung, are some important trades in this block.

Lunglei block received 18 different trades under Agricultural & Allied Sector. But more than 83 percent beneficiaries of Block are concentrated in 6 trades, name, WRC, Orange, Terracing, Tung, Pisciculture and Banana.

The largest number of beneficiaries in this sector is found in Khawzawl Block (4.810). There are 18 different trades under Agriculture and Allied Sector. However, about 94.98 percent of total beneficiaries of this sector are engaged only in six different trades such as WRC, Terracing, Tung, Pisciculture and Banana. Tung is the most important trade for this block and it accounts for more than 56 percent of the total beneficiaries in this block and more than 49 percent to the beneficiaries of Tung for the whole state.

Ngopa block has been least number of beneficiaries under this sector with only 562 families which are concentrated in 12 different trades in this block. WRC and Tung are the two important trades which account for 262 (46.61%) and 105 (18.68%) beneficiaries respectively.

(a.2) *Density Pattern of Beneficiaries:*

It is important to study the density of beneficiaries in each block as it reveals clear picture of the impact of the scheme. For this purpose an area of 1000 ha has been taken as an areal unit. So, the density of beneficiaries has been calculated by number of beneficiaries per 1000 ha.

In Agriculture and Allied Sector, the density of beneficiaries does not show any relations with some Socio-Economic factors such as - rural population and its percentage to total population, Cultivated areas (total as well as percentages),

Education, Medical facilities. Market availability. Power supply. Transport and communication etc. So, it is clear that this scheme is based on land suitability for Agriculture and Allied sector rather than other developmental activities.

The 12 blocks covered by the NLUP scheme can be divided into three classes according to the density of beneficiaries. The first category includes Thingdawl, Serchhip, Zawlnuam and Khawzawl blocks. The density of beneficiaries in those blocks are – 37.49, 36.88, 30.31, and 29.43 beneficiaries per 1000 ha respectively. The second category includes four blocks having the density of beneficiaries between 15 to 25 beneficiaries per 1000 ha. Those blocks are – E.Lungdar (23.74), Lungsen (19.74), Thingsulthliah (15.91), and Tlangnuam (15.50). The third category of less intensity includes those blocks which have less than 15 beneficiaries per 1000 ha. The names and their density are as follows: - W. Phaileng(14.88), Lunglei (11.24), Reiek (9.28) and Ngopa (3.81) (Fig.-5.1a).

(b.1) *Strength of Beneficiaries in Animal Husbandry and Veterinary Sector:*

There are ten (10) different trades under this A.H. & Vety. Sector such as – Hill cattle, Dairying, Piggery, Goat rearing, Poultry, Rabbit rearing, Duck rearing, Sheep rearing, Mithun and Cross breed. Among these Piggery and Hill cattle are two most important trades and they account for 9,057 (49.57%) and 5,574 (30.50%) beneficiaries of this sector under NLUP.

Table - 5.3: Block-wise Distribution of Beneficiaries in Animal Husbandry and Veterinary Sector under NLUP Scheme.

Trade	Thingsulthliah	W. Phaileng	Reiek	E. Lungdar	Thingdawl	Zawlnuam	Serchhip	Lungsen	Tlangnuam	Lunglei	Khawzawl	Ngopa	Total
Hill cattle	246	536	114	629	151	382	226	710	30	233	1161	1156	5574
Dairying	60	2	15	70	131	4	137	-	405	82	110	42	1058
Piggery	983	855	583	236	834	384	428	1567	387	959	1387	454	9057
Goat rearing	45	185	24	77	44	79	39	30	6	101	115	24	769
Poultry	68	48	56	95	67	-	141	-	22	55	302	55	909
Rabbit rearing	3	-	-	1	2	-	-	-	2	4	59	8	79
Duck rearing	3	-	3	-	16	26	7	-	-	1	4	3	63
Sheep rearing	2	-	5	14	-	10	14	-	-	-	41	2	88
Mithun	28	-	-	350	-	-	31	-	-	3	117	143	672
Cross breed	-	-	-	-	-	-	-	1	-	-	-	-	1
Total	1438	1626	800	1472	1245	885	1023	2308	852	1438	3296	2102	18270
Area (ha)	89439	103576	97218	137220	125765	100763	80252	104630	54501	119470	163703	147319	1823911
Beneficiaries per 000 ha.	16.07	15.69	8.22	10.72	9.89	8.78	12.74	22.05	36.84	12.03	20.13	14.28	10.01

From the total 10 trades. 9 different trades are offered to Thingsulthliah block and the beneficiaries from this block are mainly concentrated in Piggery and Hill cattle. The number of assisted families for these two trades are 983 (68.35%) and 246 (17.10%). The other beneficiaries are engaged in Dairying, Goat rearing, Poultry, Rabbit rearing. Duck rearing. Sheep rearing and Mithun. The total number of beneficiaries in this block is recorded 1438 (7.87% to the total beneficiaries in the state).

There are five important trades in W.Phaileng block namely Hill cattle, Dairying, Piggery, Goat rearing and Poultry. More than 85 percent of the beneficiaries are engaged in Piggery and Hill cattle. The number of beneficiaries in this block are 1,626 which account for 8.89 percent to the total beneficiaries of the state.

From Reiek block 800 families are selected for 7 trades under this Sector. The names of those trades and number of beneficiaries are – Hill cattle (114), Dairying (15), Piggery (583), Goat rearing (24), Poultry (56). Duck rearing (3) and Sheep rearing (5). Piggery has the largest beneficiaries in number and it accounts for 72.87 percent of the total beneficiaries in the block.

E. Lungdar has 1472 beneficiaries which are engaged in 7 different trades. Among those trades, Hill cattle, Piggery and Sheep rearing are more appreciable than

the others, and 82.54 percent of the total beneficiaries are confined in these three trades.

Thingdawl block received Government assistance through 7 trades – Hill cattle, Dairying, Piggery, Goat rearing, Poultry, Rabbit rearing and Duck rearing The three important trades on the basis of their beneficiaries are Piggery (834), Hill cattle (151) and Dairying (131), 89.63 percent to the total beneficiaries are engaged in these three trades.

The beneficiaries in Zawlnuam block are concentrated towards Piggery and Hill cattle, and more than 86 percent of the beneficiaries is engaged in these two trades. The other trades in this block are Dairying, Goat rearing, Duck rearing and Sheep rearing.

The total 1,023 families from Serchhip block are engrossed in 8 different trades such as Hill cattle, Dairying, Piggery, Goat rearing, Poultry, Duck rearing, Sheep rearing and Mithun rearing. Piggery, Hill cattle, Poultry and Dairying are having more beneficiaries with more than 90 percent.

Though there are only four trades viz. Hill cattle, Cross breeding, Piggery and Goat rearing are found in Lungsen R.D. Block. The number of beneficiaries and the trades are Hill cattle (710), Piggery (1.567), Goat rearing (30) and cross breed (1).

In Tlangnuam block, there are 6 different trades under this Sector where NLUP give emphasis. They are namely, Hill cattle, Dairying, Piggery, Goat rearing, Poultry and Rabbit rearing. Maximum beneficiaries are engaged in Dairying (405) and Piggery (387). About 98.50 percent of the total beneficiaries are engaged in these three trades. The total number of beneficiaries in this block is covered 2,008.

Beneficiaries from Lunglei R.D. Block are enlisted in 8 different trades, viz., Hill cattle, Dairying, Piggery, Goat rearing, Poultry, Rabbit rearing, Duck rearing and Mithun. But 82.89 percent of the beneficiaries are engaged in Piggery (959) and Hill cattle (233). A total number of beneficiaries in this block is accounted for 1,438.

There are 9 trades in Khawzawl R.D. Block, only Crossbreed is not found in this block. This block has maximum number of beneficiaries under this Animal Husbandry and Veterinary Sector – 3,296 (18.04% to the total beneficiaries in the state), Piggery and Hill cattle have very high percentages of beneficiaries, 77.30 percent are engaged in these two trades.

In Ngopa block, there are different trades viz. Hill cattle, Dairying, Piggery, Goat rearing, Poultry, Rabbit rearing, Duck rearing, Sheep rearing and Mithun. Out of 2,105 beneficiaries 1,906 (93.55%) are engaged in Hill cattle, Piggery, Goat rearing, and Mithun rearing.

(b.2) *Density Distribution:*

In Animal Husbandry and Veterinary Sector, the density of beneficiaries has been totally change from Agriculture and Allied Sector. One of the most important factors for this is those areas suited for Agriculture and Allied Sector do not fit for Animal Husbandry and Veterinary Sector. But availability of Market centres plays a vital role into some extent.

Tlangnuam block having the biggest livestock market centre in the state. Therefore, it has the highest density (36.84) beneficiaries per 1000 ha., Lungsen block and Khawzawl block also have high percentages in market availability, and they are the second and third position in density of beneficiaries. The remaining 9 blocks have very low density (below 17 per 1000 ha.) of beneficiaries. They are as Thingsulthliah (16.07), W.Phaileng (15.69), Ngopa (14.28), Serchhip (12.74), Lunglei (12.03), E.Lungdar (10.72), Thingdawl (9.89), Zawlnuam (8.78) and Reiek (8.22) (Fih.-5.1b).

(c.1) *Strength of Beneficiaries in Industrial Sector:*

There are 17 different trades in this industrial Sector but Beauty parlour is found in Khawzawl block only. The names of the trades and their beneficiaries are – Arts & Painting (30), Bakery (215), Blacksmithy (156), Cane & Bamboo (26), Carpentry (1037), Chow making (52), Hand loom (259), Knitting (55), Motor works (82), Radio repairing (58), Rice huller (412), Shoe repairing (144), Steel fabrication (14), Tailoring(100), Tinsmithy (67), Watch repairing (79) and Beauty parlour (1).

Table - 5.4: Block-wise Distribution of Beneficiaries in Industrial Sector.

Trade	Thingsulthliah	W Phaileng	Reiek	E Lungdar	Thingdawl	Zawlnuam	Serchhip	Lungsen	Hangnuam	Lungler	Khawzawl	Ngopa	Total
Arts & Painting	2	2	-	2	9	1	3	-	-	5	6	-	30
Bakery	15	15	2	28	29	19	17	23	13	20	24	10	215
Blacksmithy	17	7	1	18	19	8	13	9	7	22	28	7	156
Cane & Bamboo	1	3	-	2	2	2	5	-	1	1	9	-	26
Carpentry	152	72	14	91	118	62	86	147	17	100	122	56	1037
Chaw making	6	-	-	4	15	3	10	-	5	3	6	-	52
Handloom	14	13	3	17	26	6	55	38	5	32	42	8	259
Knitting	8	1	-	7	11	1	10	-	3	-	12	2	55
Motor works	2	1	-	6	21	3	18	-	2	1	26	2	82
Radio repairing	-	-	-	7	10	3	11	-	1	9	14	3	58
Rice miller	1	1	-	80	46	10	70	-	11	48	100	45	412
Shoe repairing	5	-	-	13	25	5	18	-	8	13	20	7	114
Steel fabrication	-	-	-	2	2	-	6	-	1	-	3	-	14
Tailoring	75	31	10	46	109	32	60	65	22	55	165	30	700
Tinsmithy	12	1	-	6	6	4	8	1	5	9	14	1	67
Watch repairing	11	1	1	10	13	4	11	-	1	4	14	9	79
Beauty parlour	-	-	-	-	-	-	-	-	-	-	1	-	1
Total	321	148	31	339	461	163	401	283	102	322	606	180	3367
Area (ha)	39439	103576	97218	137220	125765	100763	80252	104630	54501	119470	163703	147319	1823911
Beneficiaries per 000 ha	3 58	1 42	0 31	2 47	3 66	1 61	4 99	2 70	2 05	1 96	3 70	1 22	1 84

Thingsulthliah block has 321 beneficiaries in this sector, and Carpentry and Tailoring are having 152 and 75 beneficiaries. Carpentry is the most important trade in W. Phaileng block, in which 72 (48.64%) out of 148 beneficiaries are engaged. While remaining 51.36 percent beneficiaries is engaged in 11 different trades.

Reiek block has the least beneficiaries in number (31) and only 6 trades are allotted in this block. Tailoring and Carpentry account for 24 beneficiaries, which is 77.42 percent. In E. Lungdar block, Carpentry and Rice huller are the two important trades on the basis of the strength of number of beneficiaries. These two trades account for 50.44 percent (171) while there are 16 different trades in this block. Like the former blocks, Carpentry and Tailoring are having more beneficiaries (about 50%) than the other trades in Thingdawl block.

In Zawlnuam and Lungsen blocks, Carpentry and Tailoring are important trades than the others. These two trades in these blocks account for nearly 57.66 percent and 39.57 percent respectively.

Serchhip, Lunglei and Khawzawl blocks are also having the same pattern of distribution of industrial trades. Carpentry, Handloom, Rice huller and Tailoring are important trades in these blocks. And these three trades account for 67.58, 73.29, and 70.79 percent respectively. Like wise, Tlangnuam and Ngopa blocks have Bakery,

Carpentry, Rice huller and Tailoring as these two blocks account for 56.25 percent and 78.33 percent respectively in these four trades.

Over all Bakery, Carpentry, Handloom, Rice huller and Tinsmithy are important trades in these 12 blocks where NLUP is implemented. Transportation net work has a prominent effect on density of beneficiaries in Industry Sector. Those blocks along the National Highway are having high density of beneficiaries. But in Tlangnuam block, the pull effect of Aizawl town has been so strong and there is no development in rural industries. Other big towns also have an influential effect on rural industrialisation such as Khawzawl, Champhai, and Lungsen.

(c.2) *Density Distribution:*

All 12 blocks covered by the scheme can be categories into two broad classes – Low density of beneficiaries (above 2.5 beneficiaries per 1000 ha) and very low density of beneficiaries (less than 2.5 beneficiaries per 1000 ha).

The first category includes 5 blocks which are: Serchhip (4.99), Khawzawl (3.70), Thingdawl (3.66), Thingsulthliah (3.58) and Lungsen (2.70). The second category consists the remaining 7 blocks, which are: E. Lungdar (2.47), Tlangnuam (2.05), Lunglei(1.95), Zawlnuam (1.61), W Phaileng (1.42), Ngopa(1.22) and Reiek (0.31) (Fig.-5.1c).

3.0 The performance and Change in Rural Economy:

In fact, in all the Blocks except Tlangnuam where Aizawl town is located, the economic sectors are based on rural activities. Even the urban centres do not have their own economies. They are emerging due to demand of the rural areas and are considered as 'feeders' to rural economy. Therefore, the whole economy of the state is characterised as rural-based where agricultural sector dominates. The output data of economic sector are difficult to get. However, considering the areal extent and labour force data of three points of time, the performance and changes in economic sectors are interpreted.

(a) *Changes in Land use (1990-91 to 1997–98):*

Of course, landuse is a major element of primary sector of economy. The total area under various uses is recorded 19,763 sq. km. The forest cover has dominance in land use which was recorded about 75.6 percent in 1991-1992 and rise to 89.0 percent during 6 years of time of NLUP.

Table - 5.5: Area in Various Landuse Categories and Changes therein.

Landuse category	Area (1991-92		Area (1997-98)		Change	
	Total (in ha.)	%	Total (in ha.)	%	Total (in ha.)	%
Protected forest	130000	6 16	120900	5.73	-9100	-7.00
Reserved forest	514000	24.41	600897	28.50	86297	16.76
Wildlife sanctuary	68100	3.23	79420	3.76	11320	16 22
Others	881400	41 78	1076283	51.07	7744117	36 71
Total forest area	1593500	75 58	1877500	89.06	284000	13 49
Jhum (Paddy)	31975	1.85	46691	2.21	14716	46.02
WRC & HYV	16464	0.78	21423	1.01	4959	30..13
Maize	6213	0.29	8260	0.39	2047	32.94
Pulses	3469	0.16	4180	0.19	711	20.49
Oil seeds	7016	0.33	7946	0.37	930	13.25
Cotton	2875	0.13	962	0.04	-1913	-66.53
Hort. Vegs	5185	0.24	7248	0.34	2063	39.78
Others	23635	1.12	2129	0.10	-21506	-90.99
Total cultivated areas	96832	4.59	98839	4.68	2007	2.07

Source: Final Area and Production of Crops in Mizoram 1991-92 and 1997-98. Statistical Handbook Mizoram, 1992 and 1998.

The above Table of land-use reveals that the state has a progressive growth in forest areas during the period between 1990-91 and 1997-98. The area under reserved forest and Wildlife sanctuary is added by 976.17 ha in this period and the total forest areas increased by 2,84000 ha that is nearly 14 percent from 75.58 percent (1990-91) to 89.06 percent (1997-98). But the area under Protected forest has been dwindled by a little share of 9100ha. It is negligible in compare to the remarkable extent of forest cover areas. According to this data, Mizoram is one of the greenest states in the country. But examining the agriculture data and changes therein, it is noticed that the agricultural system is neither so progressive nor well developed. The whole cultivated area is increased by only 9.5 percent during those seven years and the cultivated area is still less than 5 percent to the total geographical area.

Jhum or Shifting cultivation remains one of the most important agricultural system in the state. In 1991, jhum cultivation covers an area of 31975 ha (33.02% to the cultivated areas) and at the end of another seven years, the jhum area is expanded to 46691 ha which is more than 47 percent to the total cultivated areas. The people are unable to chose alternative trades for their livelihood due to the lack of transportation. modern technologies, difficult terrain etc. WRC & HYV are also very important in the state but the area under cultivation of WRC & HYV are still far behind jhum cultivation. Though it is one of the most modernised system and yield is high, the physical condition of the state restricted the practice of WRC & HYV.

Maize and Horticulture (Vegetable crops) show a good response in the agricultural land-use system. Maize and Horticulture (generally vegetables) crops covered an area of about 6217 ha and 5158 ha during the time of implementation of NLUP in 1990-91 which were raised to 82.60 sq. km and 7248 ha respectively till the end of NLUP in 1997-98.

Pulses and Oil seeds are also important crops for fulfilling demand of local people. But they do not have much change in the period of NLUP scheme. In 1991, the area under pulses was recorded 3469 ha and after seven years it is increased by only 711 ha. Like wise, Oil seeds accounted for an area of about 7016 ha in 1990-91 and its area is added by only 930 ha in 1997-98.

Cotton and others (including Potato. Colacacia. Sweet potato, Tapioca. Spices and other Horticulture crops) are the most blunder crops in the state. In 1990-91, the area under Cotton crop was recorded 2875 ha (which is 0.13 percent to the geographical area). While it declined by 1913 ha. It means that cotton crop area has been reduced by more than 66 percent By taking all the remaining crops as a whole into account, it shows more disgraceful result than the Cotton crop. But some of them are still progressive in some ways. In 1990-91. other crops covered an area of 23635 ha and the area under that category was the second largest in area covered. But after seven years the area under other crops is shrinking to 2129 ha. That means its area was reduced by 21506 ha.

The above data and explanation unfold the changes in land use pattern during the period of 1990-91 to 1997-98, and it clearly shows that the land use system of the state is highly depends upon the physical conditions of the state and it altered by the implementation of NLUP in the state.

(b) *Changes in Animal Husbandry & Veterinary Sector*

Livestock plays an important role towards economic self sufficiency. Period to the attainment of Union Territory status in 1972, there was no significant impact in the field of Animal Husbandry & Veterinary in Mizoram. Now, there is a full-fledged Directorate of Animal Husbandry & Veterinary Department in the state.

The state Government conducted Veterinary Census after every five years, and the number of livestocks in Mizoram for 1987 and 1997 of the selected 12 blocks, changes in number and percentages are shown in Table-5.6. The number of livestocks can be categorised into two groups, namely - Cattle and other livestocks.

Table – 5.6: Changes in Animal Husbandry and Veterinary Sector.

Sl No	Block Name	Number of Livestocks				Changes in			
		1987		1997		Cattle		Others	
		Cattle	Others	Cattle	Others	Total	%	Total	%
1	Thingsulthliah	1657	52176	2092	73823	435	26.25	21647	41.48
2	Pahileng 'W'	846	104471	728	68458	-118	-13.95	-36013	-34.47
3	Reiek	715	29996	1116	34942	401	56.08	4946	14.87
4	Lungdar 'E'	4269	73836	2885	145750	-1384	-32.42	71914	97.39
5	Thingdawl	5256	71994	2838	98645	-2421	-46.06	26651	37.01
6	Zawlnuam	1982	46622	1270	80187	-712	-35.93	33565	71.99
7	Serchhip	1218	42306	812	75778	-406	-33.83	33472	79.11
8	Lungsen	1532	33136	507	26127	-1025	-66.90	-7009	-21 15
9	Tlangnuam	4749	92958	3995	248843	-754	-15.87	155885	-40 14
10	Lunglei	2140	93692	1374	83739	-766	-35.79	-9953	-10.55
11	Khawzawl	6896	95624	4315	137791	-2581	-37.42	42167	44.09
12	Ngopa	4114	57126	2360	55591	-1754	-42.63	-1535	-2.68
	Total	35374	793937	24289	1129674	-11085	-31.34	335737	42.29

Source: 14th and 16th Quinquennial Census of Livestocks, 1987 and 1997, Government of Mizoram, Aizawl.

Cattle includes Hill cattle or Indigenous and Cross breed. During this period of 1987 to 1997, the number of cattle in the selected 12 blocks has been reducing at alarming rate. Only 2 blocks from the selected 12 blocks, viz., Thingsulthliah and Reiek blocks, have positive percentages of change in this period. Reiek block has the highest percentage of change with 56.08 percent and Thingsulthliah block maintain the second position with 26.25 percent increase in cattle stock. All the other selected

blocks show a negative change, and Lungsen block provides the worse decrease with 66.90 percent (Table – 5.6).

Other livestocks include Mithun, Sheep, Goat, Horses and Ponies, Pigs, Poultry, Ducks and Buffaloes. In 1987-88 these other livestocks account for 793937 in number as 75 percent to the total number of livestocks in the state.

This category provides a better and more progressive change than the former category. But five blocks, W.Phaileng, Lungsen, Tlangnuam, Lunglei and Ngopa have less number of other livestocks in 1997 than 1987. E.Lungdar block gives the highest percentage of change with 97.39 percent. The other successive blocks and their percentages of changes in other livestocks are as shown here : Thingsulthliah (41.48%), Reiek (14.87%), Thingdawl (37.01%), Zawlnuam (71.99%), Serchhip (79.11%) and Khawzawl (44.09%). By comparing these two categories, the latter one is more progressive than the other, and its percentage of change for the 12 blocks is 34.42 percent while the former one has – 39.35 percent.

(c) *Status of Small Scale a Cottage Industries:*

Since there is no large or medium scale industries unit in the state, Small Scale or Cottage industries play a vital role to attain people's needs specially in rural areas where NLUP is implemented. Though they are not as productive as large and Medium Scale industries, the Small Scale and Cottage industries have many advantages for

Table - 5.7: Block-wise Industrial Units of Small-Scale and Cottage Industries in Mizoram as on 1991.

	Categories of Small Scale and Cottage Industries														
Blocks	1	2	3	4	5	6	7	8	9	10	11	12	Total Units	Area (ha)	Industries per 000 ha
Thingsulthliah	4	22	2	-	-	-	-	-	6	-	15	-	49	89439	0.54
W. Phaileng	-	4	-	-	-	-	-	-	-	-	-	-	4	103576	0.03
Reiek	5	-	-	-	-	-	-	-	-	-	-	-	5	97218	0.05
E. Lungdar	33	2	1	1	-	-	-	-	1	1	10	1	50	137220	0.36
Thingdawl	8	8	9	2	3	1	4	-	2	1	34	2	74	125765	0.58
Zawlnuam	5	5	-	-	-	-	1	-	1	-	2	1	15	100763	0.14
Serchhip	12	13	90	1	1	-	2	-	3	-	33	-	155	80252	1.93
Lungsen	-	1	-	-	-	-	-	-	-	-	-	-	1	104630	0.009
Tlangnuam	96	156	156	72	26	38	40	21	20	16	497	29	1162	54501	21.32
Lunglei	16	59	10	12	2	8	2	1	13	3	104	17	247	119470	2.06
Khawzawl	15	34	9	4	1	1	1	-	1	-	39	2	107	163703	0.65
Ngopa	3	3	-	1	-	-	-	-	-	-	4	-	11	147319	0.07
Total 12 Blocks	197	307	277	93	33	48	50	22	47	21	738	52	1885	1823944	1.03

boosting rural economy of the state. They are easy to launch even in rural areas as they are not difficult to transport; they consume very less power and easy to operate.

Though there are different kind of trades under Small Scale Industries, only 12 trades are selected for this work which are important in Mizoram. They are as:

1. Food products & Allied services.
2. Tobacco products.
3. Manufacture of wood and wooden products.
4. Manufacture of textiles and textile goods.
5. Manufacture of paper products, publishes and Allied.
6. Manufacture of rubber, plastics and petroleum products.
7. Manufacture of chemicals and chemical products.
8. Manufacture of non-metelics and material products.
9. Basic metals and allied industries.
10. Manufacture of metal products and parts.
11. Manufacture of leather goods and repairing.
12. Manufacture of transport equipments and parts.

Food products and Allied services are concentrated in Tlangnuam block and E.Lungdar block. These two blocks occupy more than 50 percent of the units of this services. The second trade – Tobacco products is engrossed in Tlangnuam block.

Most of the units of wood and wooden products are located in Tlangnuam and Serchhip blocks. These two blocks account for 88.80 percent to the total units of this

trade Tlangnuam block, as the location of State's Capital has maximum units in every trades, this block alone constituted for more than 60 percent to the total units of Small Scale and Cottage Industries.

Next to the Tlangnuam block, Lunglei block having the second largest town in the state is another important area for industries. Some blocks which are not connected by National High way are having few number of industrial units viz. W.Phaileng, Reiek, Lungsen, Zawlnuam and Ngopa blocks. Lungsen block shows the lowest number of industrial unit with only one unit, and the number of unit per '000 ha Lungsen block is 0.009 while it is more than 21 in Tlangnuam block.

4.0 Changes in Infrastructure Attributes:

Infrastructure plays an important role for socio-economic development in any area or region, though it is not directly related to the sectors of rural economy. Transport network, electricity, educational and medical facilities available in the area are main attributes of infrastructure for fastening the rate of development. They are studied here in detail.

(i) ***Transport Network:***

Availability of transport system plays a vital role in the development of any area or areas. But the system of transportation may differ from place to place. In Mizoram due to the lack of air and water ways surface transportation (road) is the life

line of the state. As the state is covered by mountainous and rugged areas, the development of road net work is not in a proceeding condition. During the period of 1991-92, the state was having the total length of roads as 5,158.18 km. Out of it 2,010.53 km was surfaced roads under PWD and BRO (Government of Mizoram 1992 pp. 212, 212A). In 1997, the total road length was increased by 575.47 km but the surfaced road length was added by only 63.74 km in these seven years of time. The unsurfaced road has been increased by 507.73 km.

In spite of increasing the length of roads, the most of the part of the state is inaccessible because of topographic factors (Fig. – 5.2).

(ii) ***Electricity:***

Electricity is another important attributes of infrastructure for development of the state. Most of the settlements (except few towns) of the state are classified as villages (Census of India 1991). The figures of rural electrification reveal that the total number of village electrified was recorded 382 (54.65% to total villages) in 1991 which have been raised to 672 (96.13% to total villages) in 1997. It shows a remarkable increase in rural electrification. Most of the different trades under industrial sector of NLUP scheme need power supply to take up their works and this kind of rapid growth is hopeful to help the rural people. Now, consumption of electricity is increasing gradually in the state.

(iii) ***Medical:***

Medial facilities as an infrastructure for Human Resource Development are an essential element for efficient work and human development. The following Table shows an increase in medical facilities of 12 R.D. Blocks receiving Government assistance through NLUP scheme.

Table - 5.8: Number of Medical facilities.

Blocks	1991	1997	Change	
			Numbers	Percent
Thingsulthliah	8	13	5	62.50
W. Phaileng	6	12	6	100.00
Reiek	9	6	-3	-33.33
E. Lungdar	25	20	-5	-20.00
Thingdawl	14	20	6	42.85
Zawlnuam	14	13	-1	-7.28
Serchhip	14	16	2	14.28
Lungsen	13	17	4	30.76
Tlangnuam	7	45	38	542.85
Lunglei	14	28	14	100.00
Khawzawl	17	26	9	52.94
Ngopa	24	23	-1	-4.16

Source: Statistical Handbook, 1991 and 1997, Mizoram.

From the above Table, these 12 blocks can be categorised into four groups according to the changes in medical facilities. The first category includes those blocks having very high percentages in change such as Tlangnuam, W. Phaileng and Lunglei Blocks. The second category includes those blocks having high percentage of change in medical facilities such as Thingsulthliah, Thingdawl and Khawzawl Blocks. The third category includes those blocks with low percentages of change in medical

facilities during this period (1991-1997) such as Serchhip and Lungsen Blocks. The fourth and last category is those blocks having negative percentages in change of medical facilities which are Reiek (-33.33%), E. Lungdar (-20%), Zawlnuam (-7.28%) and Ngopa (-4.16%). Within those blocks having negative changes in medical facilities, there were some medical centres which are not function due to the absence of workers, medicine and instruments etc. So the state government has decided to lessened the centres and concentrating the workers in fewer centre with better facilities.

(iv) *Educational Facilities and Changes Therein:*

Education is very important parameter of sharpening the labour-skill which is boon for socio-economic development of any area. Though there are many colleges and higher studies in the state. However, only three basic educational institutions are taken into account, namely Primary School, Middle School, and High School which are reflection of the change in primary education and its changes during NLUP. The following Table provides change in educational facilities of the blocks covered under NLUP scheme.

Table - 5.9: Total Number of Educational facilities.

Blocks	Primary School				Middle School				High School			
.	1991	1997	Change	%	1991	1997	Change	%	. 1991	1997	Change	%
Thingsulthliah	29	42	23	79.31	16	29	13	81.25	6	13	7	116.66
W. Phaileng	30	41	11	36.66	11	21	10	90.90	2	8	6	300.00
Reiek	25	31	6	24.00	13	18	5	38.46	5	9	4	80.00
E. Lungdar	51	52	1	19.60	38	27	-11	-28.94	11	16	5	45.45
Thingdawl	34	82	48	141.17	18	52	34	188.88	8	18	10	125.00
Zawlnuam	44	63	19	43.18	15	30	15	100.00	5	15	10	200.00
Serchhip	22	69	47	213.66	16	39	23	143.75	4	14	10	250.00
Lungsen	49	73	24	48.97	19	36	17	89.47	3	7	4	133.33
Tlangnuam	13	162	149	1146.15	4	109	105	2625.00	NA	56		
Lunglei	38	99	61	160.52	13	53	40	307.69	5	21	16	320.00
Khawzawl	44	76	32	72.72	19	58	39	205.26	7	26	19	271.42
Ngopa	40	43	3	7.50	25	31	6	24.00	14	16	2	14.28

Source: (1) Census of India. 1991. Mizoram Part B and (2) Block Statistics Report, 1997.

From the above Table, it is clear that those blocks far from the main transportation network (National High way) are having low percentage of increase in Primary School, such as W. Phaileng, Reiek, E.Lungdar, Zawlnuam, Lungsen and Ngopa R.D. Blocks. While those blocks along the main road are having high percentage of increase in Primary School such as Thingsulthliah, Thingdawl, Serchhip, Tlangnuam and Lunglei Blocks.

A significant change is recorded in Middle School except two blocks - Reiek and Ngopa which are having low percentage of change, and E. Lungdar block display a negative change in Middle School. Tlangnuam block, as the most populated block has a magnificent growth with more than 26 folds. Regarding the changes in the number of total High School figures, most of the Blocks give progressive changes but Ngopa and E. Lungdar Blocks are beyond the realms of development in Educational facilities.

From the above Table, it is clear that those blocks which are not connected by National Highway, or those blocks without any important centre (at least Sub-Division Headquarters) have low profile in Educational facilities. It means that there is direct impact of road network on the distributional pattern of education facilities. Thus, connectivity and expansion of road network play pivotal role in development and concentration of medical as well as educational facilities in the state.

5.0 Concluding Remark:

In this Chapter, main attention is focussed towards the changing pattern of beneficiaries under NLUP in various sectors of economy. It can be concluded here that there is a significant increase in the number of beneficiaries in all three sectors of economy which are associated with the NLUP scheme in the state. In fact, the percentage increase in the beneficiaries is recorded extremely high in industrial sector while the beneficiaries size is smaller in this sector. On the other hand, the Agriculture and Allied Sectors are dominating the rural economy of the state but percentage increase of beneficiaries in these sectors has been recorded only 102.07 during the 6 years of time of the implementation of this scheme. The details of distribution of beneficiaries show that Horticulture crops have major activities or trades where the policy NLUP is concentrated in Agriculture and Allied Sectors. Further, the distribution of beneficiaries in Animal Husbandry & Veterinary shows that hill Cattles, Piggery and Poultry are main trades of this sector where most of the beneficiaries are concentrated except East Lungdar block where sheep rearing is important activity.

Industrial sector is also very important in Rural Economy though it is weak in the state. However, the concentration of the beneficiaries in the distribution of various trades in the sector is recorded in Carpentry, Rice Huller, Bakery and Handloom activities which are generally based on local raw material and available skill labour force for those activities.

So far as landuse is concerned, landuse is dominated by food grains especially paddy, Tung. But beneficiaries are concentrated in Horticulture which are generally grow on hill slopes.

Of course, infrastructural attributes which include road, electricity, education and medical facilities are important for better performance of NLUP and for changing the landuse pattern. It is studied in the last section of this chapter and is found educational facilities are sufficient but medical facilities are recorded less and concentrated only in a few centres. Furthermore, road network which is a major element of infrastructure development is confined in some areas because topographical constraints and climatic conditions. And, therefore, the accessibility is not up to the mark. On account of such type of available infrastructure in the state and concentration of the facilities of development, the beneficiaries are also concentrated in their distributional pattern and confessed in their rates. It hampers the growth of economies. The main findings and relationship of the distributional pattern of beneficiaries and their economic activities can be described separately under the next chapter.

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CHAPTER - VI

MAIN FINDINGS AND CONCLUSION

1.0 Introduction

In the preceding Chapters of the present research work, explanation and analysis of the physiographical attributes, changing land-use patterns with reference to the intensity/density of beneficiaries under the scheme NLUP have been interpreted. The main emphasis has been given on physiographic factors and changing land-use pattern for establishing the relationship and giving the answers to the research questions as posed the present research. On the other hand, the changing pattern of beneficiaries and their Block-wise distribution have also been shown. The major facts and findings of the research and even to evaluate the impact of NLUP on land-use on the economic landscape of Mizoram may only be generalised by correlating the attributes of these two sets of conditions. The comparisions of the spatial pattern with the intensity of beneficiaries of various sectors and the relationship of such attributes may be studied here to draw the main findings and to find out the clues whether NLUP is fail or successful for developing the economic sectors of the state. On the basis of such facts and factors, the present discussion may lead us towards the synthesisation of the facts. On the basis of such

factors, the generation and conclusion may also be drawn here which are interpreted in the following paragraphs.

2.0 Main Findings:

Since the present work is based on secondary data of only 12 Blocks of the state which are located generally in the high mountain ranges of the Eastern part as well as of the North-Western parts of it, the sample Blocks are representatives of varieties of physiographic as well as socio-economic ethos of the data. The economy of these villages within the Blocks where NLUP was implemented, is the representative of the purely rural areas of the state. The entire economy of these blocks is based on primary sector (Agriculture, Animal Husbandry and Veterinary) and Cottage Industries (i.e., local resource base). In fact, the study of changes in land-use is the main aspect of understanding the development of the primary sector of an area and for showing the impact of NLUP on land-use patterns. Land-use pattern are emerging here in a specific set of environmental conditions which vary spatially. Therefore, there is a significant spatial variation in land-use patterns. However, the changes in them are recorded insignificantly over time. The land-use is forest-dominated. In 1991-92 about three-fourth area was reported under forest cover which was raised significantly by 14 percent during the period of implementation of NLUP. On the other hand, area under permanent cultivation is very less (4.6%) in 1991-92 and which was increased by nearly 2 percent during the

same period of time. Therefore, it is observed there is no significant change in the cropping pattern. However, the crop yield is increased significantly. It means that the intensification of agricultural land-use has been started in the state and the area under jhum cultivation has been gradually changed into settled cultivation during the NLUP time. The major findings of the present research are forwarded as follows.

(A) The selection of Blocks for implementation of NLUP and even in the selection of beneficiaries from the Blocks are done on the basis of economic status of households because the major thrust of the government is to stop the jhum cultivation and change it into the permanent intensive cultivation. Therefore, the beneficiaries are selected accordingly under the scheme. In some representative Blocks, the percentage of total beneficiaries has gone up to 109 percent of the total households of the Block. The scheme was implemented twice in this particular Block during this period of time and therefore, near about 9 percent of total households have been selected twice in the scheme. On account of topographical constraints of landscape, the intensity of beneficiaries is recorded lesser which varies sectorally. The intensity of beneficiaries in Agriculture and Allied sector is comparatively higher in Thingdawl and Serchhip Blocks which are located in the central valley of Northern as well as Central parts of the state On account of connectivity of these two Blocks with National Highway, the intensity of beneficiaries is recorded higher. Agriculture is the main sector of

economy. More than 60 percent of workforce is engaged in Agriculture and Allied sector. Therefore, intensity of beneficiaries in Agriculture and Allied sector is recorded higher than the other sectors of economy. Reiek Block has low intensity (9.28 persons/1000 ha in agriculture and allied sector; the 8.22 persons/1000 ha in Animal Husbandry and Veterinary and only 0.32 persons/1000 ha in Industrial sector). It may be because of difficult terrain, steep slope, poor infrastructure and weak road connectivity in the area.

(B) The largest number of beneficiaries belong to Agriculture and Allied sector. However, the percentage change of beneficiaries in Industrial sector is recorded highest (i.e., 138.59%) which the beneficiaries in all sectors have been increased by more than 100 percent only. The highest increase of beneficiaries in Industrial sector is recorded because of low level of the industrial development. During this period the state government tried to wipe out the backwardness of the state in industries especially in those Blocks having market facilities within their areas, and good connectivity with the state capital which remains as the most important and biggest market centre in the state.

In a hilly region like Mizoram, it is difficult to establish medium or big industries. Small Scale and Cottage Industries are the only suitable activities which can survive from many severe problems, viz., lack of good infrastructure, skilled

labour, power supply etc. while the state government tried to upgrade the rural industries. Many industrial units did not pursue for a long period of time, even some units did not exist at all. During this period (1991-97), a total 1950 families were assisted in Industrial sector. But the actual number of newly established Small Scale and Cottage Industries during this period was 505 units only. And more than 50 percent were located in the urban areas. That was due to some factors such as - the rural people did not realised the importance of rural industries. The field workers and some NGOs are supposed to initiate public awareness campaign about the scheme. But such awareness campaign among rural people is hardly successful. Many of them were satisfied when they received the money and do nothing about their trade.

Another important factor is 'all the trade should be market-oriented'. For and under-developed area like Mizoram, self-sufficient is very important but the more important thing is trade and products should be market oriented because the beneficiaries are not in a position to produce everything they need. And the beneficiaries should aware of this before selecting their trades.

(C) Cattle remains as the most important livestock in terms of meat supply, dairying etc., but the NLUP scheme is emphasising on other livestocks (mithun, sheep, goat, horses, pony, pigs, fowls, ducks, and buffaloes). During the period of ten years (1987-97) only two Blocks (Thingsulthliah and Reiek) show a positive change in cattle livestock with 26.25 percent and 56.08 percent respectively.

The remaining 10 Blocks show negative change. By taking all the 12 Blocks as a whole, there was a negative change with -31.34 percent in cattle livestock. It means that the number of cattles in veterinary sector has been decreased during scheme implementation.

On the other hand, the other livestocks (mithun,sheep, goat, horses, pony, pigs, fowls, ducks and buffaloes) revealed a significant increase by 42.29 percent as a whole. Lungdar 'E', Serchhip and Zawlnuam Blocks having very high percentage of increase (above 70%) are suitable for livestock rearing. These Blocks are located in the Northern part of the state having a suitable conditions for Livestocks in which grazing land is recorded higher. It is true to say that the NLUP scheme is emphasising on livestock other than cattle. The first important factor for this is selection/option of trade by beneficiaries, as per a mannual of NLUP scheme 'before allotting the scheme the Block area should be surveyed and examine what types of trade suit to the people'. But practically, the beneficiaries were those whose choose the trade. Many of them did not wish to do cattle farming for various reasons – such as: In order to compare with some livestocks like sheep, goat, pigs, poultry, etc., cattle needs a longer time for maturity. Long term policy is not suited to rural people, they want to get a profit in one or two years. So, they refuse to take cattle trade while they have a chance to get another. The second important factor is import of cattle from Myanmar. About 70 percent of meat demand in urban areas of the state is fulfilled from Myanmar border.

In more logical way, the effect of NLUP on various sectors of economy can be explained by establishing the relationship of various attributes related to different sectors of economy with respect to intensity of beneficiaries of these corresponding sectors of economy. The explanation of such problems is forwarded here by preparing scatter diagrams putting those attributes (as dependent variable) on Y-axis and intensity of beneficiaries (as independent variable) on X-axis on the graph. The regression equation is established and coefficient of correlation are calculated accordingly (Figs.-6.1, 6.2, 6.3, 6.4). The results of regression analysis shows that

(i) The percentage share of agricultural land is increased by 2.25 percent when 5 beneficiaries per 1000 ha of land are increased in this sector. Therefore, the 'b' value of regression equation is recorded 451 (Table- 6.1). But the correlation between these parameters is found very weak (r = 0.292). The slow increase in the agricultural land with the weak relationship between these attributes are not because of the selection of beneficiaries in the Block but may be because of physiographic constraints in changing the land-use. However, NLUP has a positive effect on this sector.

(ii) In the animal husbandry and veterinary sector of economy, cattle and other livestocks which were defined earlier are important attributes. The annual decrease of about 9.5 percent is recorded in the number of cattle when 10

beneficiaries per 1000 ha of land are increased in cattle livestock sector. However, there is an increasing trend in other livestocks when NLUP is intensified in other livestock sectors (Table-6.1). It means that the beneficiaries do not prefer to increase the cattle but want to increase the population of other livestocks like mithun, sheep, goat, poultry etc. because of domestic demand of meat. The same results of increasing other livestock may be visualised in Chapter-II.

Table - 6.1: Regression Coefficient and Coefficient of Correlation of Parameters with Reference to Intensity of Beneficiaries.

Sl. No.	Parameters	Regression Equation	Correlation (r)
1	Percentage Share of Agricultural Land	y = 1.252 + 0.451 x	0.292
2	Annual Change in Cattle (%)	y = 8.4 - 2.32 x	- 0.0432
3	Annual Change in Other Livestocks (%)	y = 18.20 + 0.962 x	0.833
4	Intensity of Industrial Units (per 1000 ha)	y = 0.752 + 0.521 x	0.392

Note: 1. Total number of observations are 12 Blocks.
2. The coefficient values of regression equation are calculated with reference to intensity of beneficiaries of the corresponding sectors.

(iii) There is a positive relationship between the intensity of industrial units and intensity of beneficiaries in Industrial sector. However, their relationship is weak (r=0.392), it may be because of physiographic constraints but it may be said NLUP that has some effect on industrial development and Small Scale and Cottage Industries are concentrated in bigger villages and towns. Industrial decentralization has taken place because of implementation of

AGRICULTURE AND ALLIED SECTOR

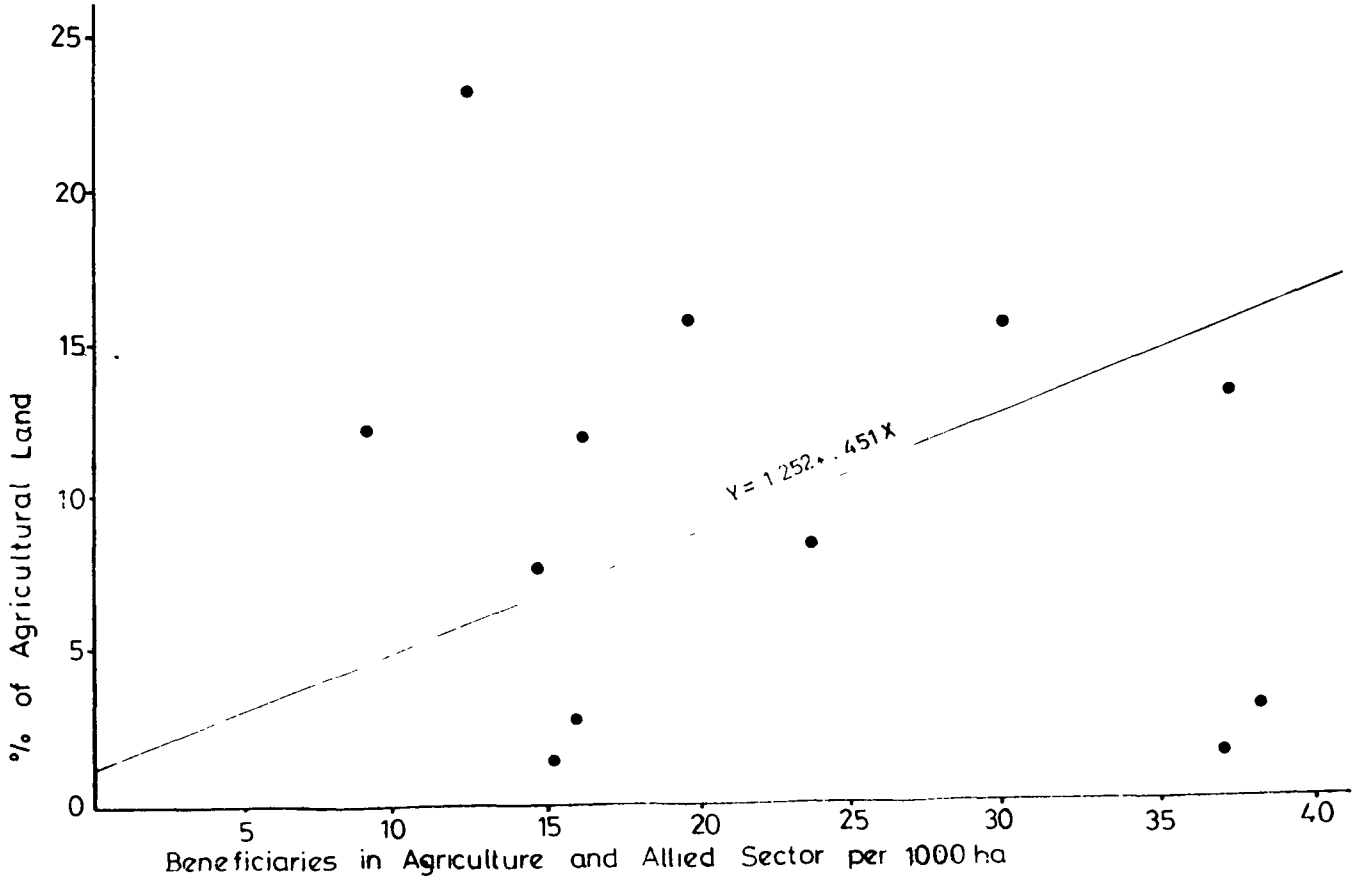
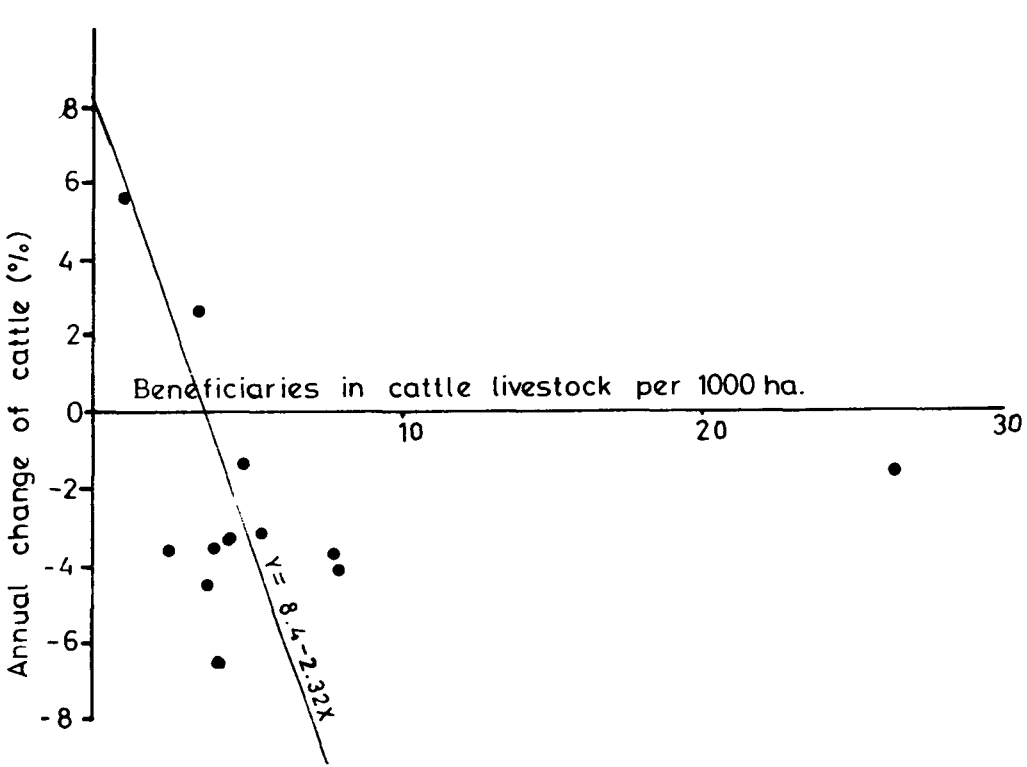


Fig. 6 1(a)

ANIMAL HUSBANDRY AND VETERINARY SECTOR



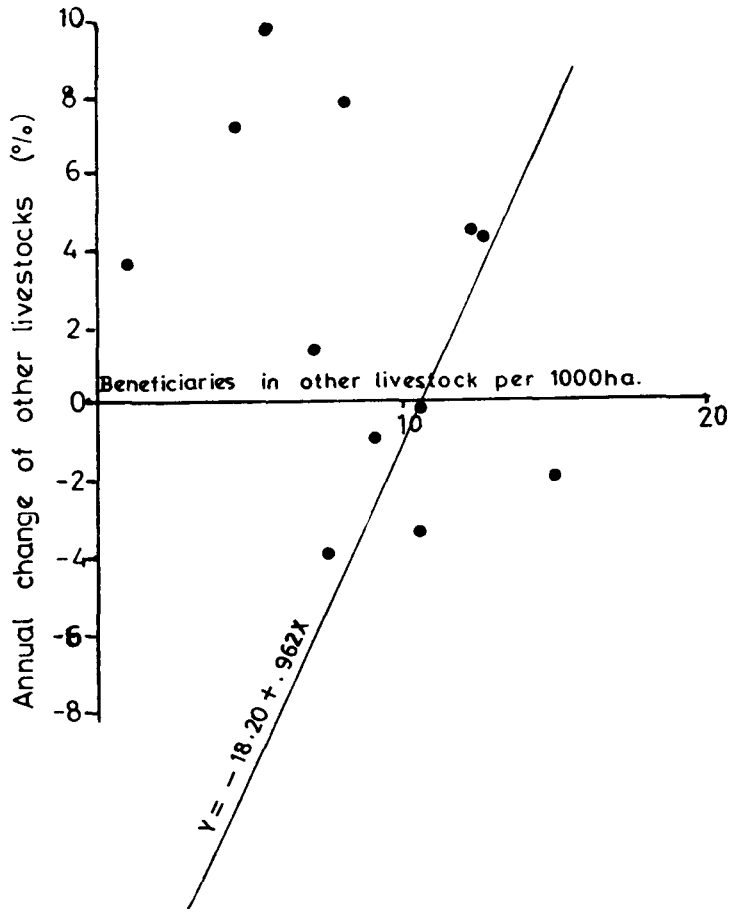


Fig 6.1 (b)

INDUSTRIAL SECTOR

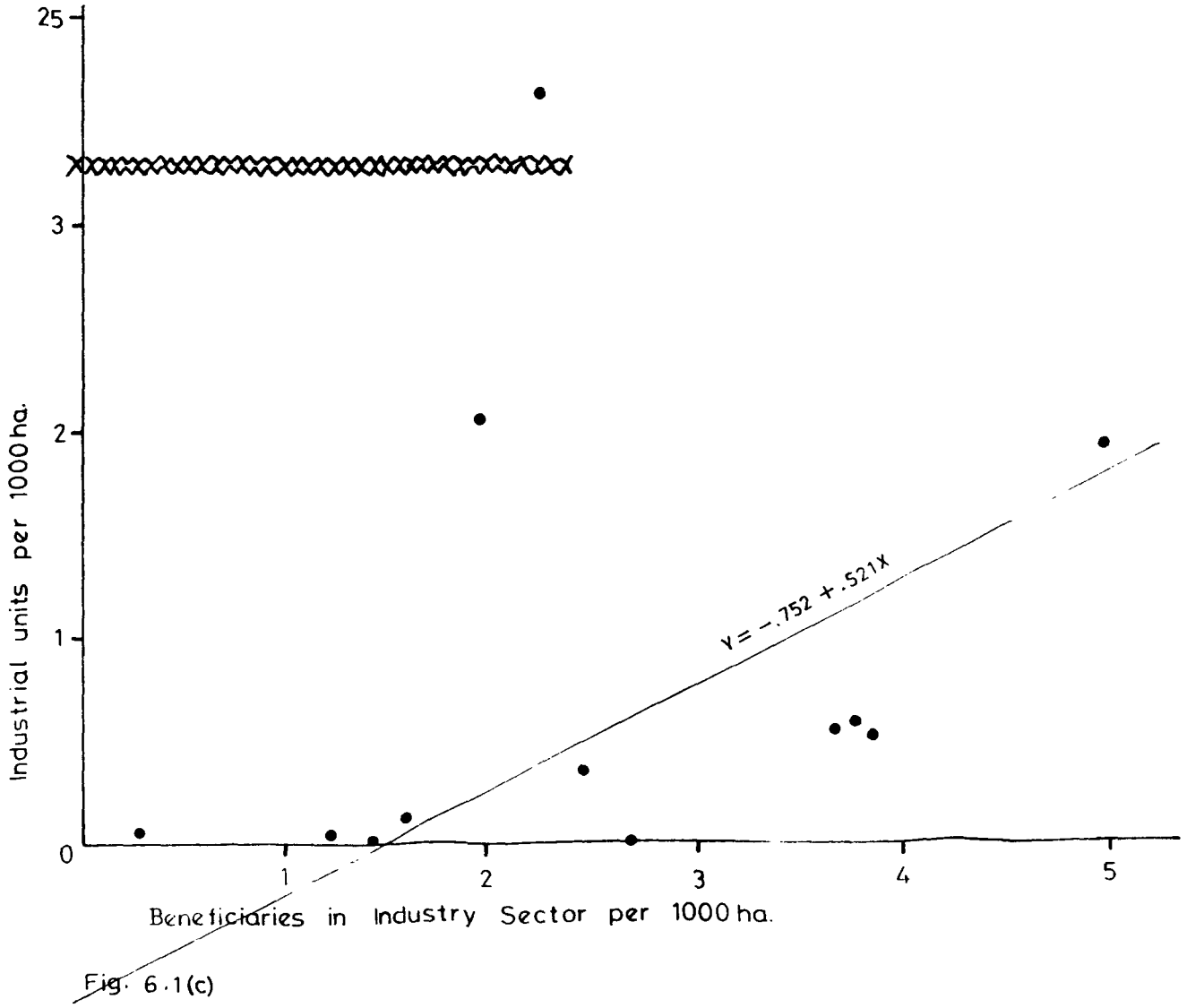


Fig. 6.1(c)

NLUP. However, the rate of increased is recorded insignificant, increased in the intensity of 2 beneficiaries per 1000 ha increases per industrial unit per ha in the state.

3.0 Conclusion:

Though this NLUP scheme was largely concentrated on Agriculture and Allied sector, the land-use system especially agricultural land-use did not provide much change during the implementation period. When the scheme was eliminated in 1998; the land-use pattern still remains the same in compare to pre-implementation period. That was due to topographical constraints, about 52 percent of the total geographical area of the state is declared as uncultivable land for any type of agricultural practices, and within the land suitable for agriculture, more than 55 percent has been declared as suitable for jhum cultivation only. Because of this, land-use pattern cannot be changed during this period.

On the other hand, the other two sectors, viz., Animal Husbandry and Veterinary sector and industrial sector had a small increase during this period. The industrial sector is still weak in the state, and livestock could not provide sufficient supply for the demand of the people. However, these two sectors show a slight increase during the implementation period and it reveals that the scheme had a positive effect on these two sectors. If the scheme had continued for a longer period

with more attention on Agriculture and Allied sector, a better development for the state is hopeful.

During the implementation period, the implementation of the scheme had some weaknesses, the state government and other organizations did not provide sufficient public awareness about the scheme and its importance for development. And the government could not follow all the operational procedures. However, the scheme had effect on secondary and tertiary sectors of economy and is helpful in diversifying the rural economy. The scheme is having positive effect on the overall economy of the state and should continue with slight modifications.

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APPENDIX – I

Trade-wise Number of Beneficiaries in Agriculture and Allied Sector (1990-1998).

Trade	Thingsulthliah	W Phaileng	Reiek	E Lungdar	Thingdawl	Zawlnuam	Serchhip	Lungsen	Tlangnuam	Lunglei	Khawzawl	Ngopa	Total
WRC	179	208	223	698	599	485	700	897	129	297	840	262	5517
Orange	-	643	439	229	1208	960	572	2	115	144	83	31	4436
Lemon	-	-	11	1	117	30	19	-	7	5	3	-	193
Pineapple	-	-	10	16	-	49	381	-	-	21	4	3	484
Sugarcane	568	-	9	98	279	22	273	-	135	79	83	23	1569
Hathora	-	66	101	2	1013	667	26	-	34	1	1	-	2079
Terracing	45	33	17	138	63	3	150	37	61	148	171	74	771
Tung	570	24	68	1205	47	-	471	-	143	166	2734	105	5533
Pisciculture	12	194	17	138	299	278	91	43	42	151	140	49	1454
Valencia	-	-	-	-	-	-	39	-	2	1	1	1	44
Mango	-	-	-	3	-	-	11	-	-	1	-	-	15
Citronella	-	17	-	-	-	-	18	-	-	-	-	-	35
Coffee	-	-	-	-	-	-	2	13	-	-	-	-	15
Tea	-	14	-	168	15	-	37	-	-	-	-	-	234
Vanana	-	-	-	13	10	-	101	-	47	212	15	7	405
Passionfruit	-	-	-	426	1	-	55	-	47	17	683	1	1230
Sericulture	5	-	8	46	32	5	14	3	-	24	10	4	151
Apple	-	-	-	69	-	-	-	-	-	-	8	-	77
Grape	-	-	-	1	-	-	-	-	-	-	15	-	16
Jamir	-	-	-	6	-	-	-	-	-	1	11	-	18
Kagzielime	-	-	-	-	-	-	-	-	-	-	6	-	6
Teak	3	-	-	-	2	76	-	-	-	-	-	-	81
Coconut	-	5	-	-	20	43	-	-	-	-	-	-	68
Betelvine	-	-	-	-	2	-	-	-	1	61	-	2	66
Betelnut	-	317	-	1	1008	437	-	-	-	1	-	-	1764
Horticulture	41	-	-	-	-	-	-	1071	-	-	-	-	1112
Gardening	-	-	-	-	-	-	-	-	-	13	-	-	13
Chow Chow	-	-	-	-	-	-	-	-	82	-	1	-	83
Total	1423	1521	903	3258	4715	3055	2960	2066	853	1343	4810	562	27469

APPENDIX – II

Trade-wise Distribution of Beneficiaries in Animal Husbandry and Veterinary Sector under NLUP Scheme.

Trade	Thingsulthliah	W Phaileng	Reiek	E Lungdar	Thingdawl	Zawlnuam	Serchhip	Lungsen	Tlangnuam	Lunglei	Khawzawl	Ngopa	Total
Hill cattle	246	536	114	629	151	382	226	710	[illegible]	233	1161	1156	5574
Dairying	60	2	15	70	131	4	137	-	4[illegible]5	82	110	42	1058
Piggery	983	855	583	236	834	384	428	1567	387	959	1387	454	9057
Goat rearing	45	185	24	77	44	79	39	30	6	101	115	24	769
Poultry	68	48	56	95	67	-	141	-	22	55	302	55	909
Rabbit rearing	3	-	-	1	2	-	-	-	2	4	59	8	79
Duck rearing	3	-	3	-	16	26	7	-	-	1	4	3	63
Sheep rearing	2	-	5	14	-	10	14	-	-	-	41	2	88
Mithun	28	-	-	350	-	-	31	-	-	3	117	143	672
Cross breed	-	-	-	-	–	-	-	1	-	-	-	-	1
Total	1438	1626	800	1472	1245	885	1023	2308	852	1438	3296	2102	18270

APPENDIX - III

Trade-wise Distribution of Beneficiaries in Industrial Sector.

Trade	Thingsulthliah	W Phaileng	Reiek	E Lungdar	Thingdawl	Zawlnuam	Serchhip	Lungsen	Hlangnuam	Lunglei	Khawzawl	Ngopa	Total
Arts & Painting	2	2	-	2	9	1	3	-	-	5	6	-	30
Bakery	15	15	2	28	29	19	17	23	13	20	24	10	215
Blacksmithy	17	7	1	18	19	8	13	-	-	22	28	7	156
Cane & Bamboo	1	3	-	2	2	2	5	-	1	1	9	-	26
Carpentry	152	72	14	91	118	62	86	147	17	100	122	56	1037
Chaw making	6	-	-	4	15	3	10	-	5	3	6		52
Handloom	14	13	3	17	26	6	55	38	5	32	42	8	259
Knitting	8	1	-	7	11	1	10	-	3	-	12	2	55
Motor works	2	1	-	6	21	3	18	-	2	1	26	2	82
Radio repairing	-	-	-	7	10	3	11	-	1	9	14	3	58
Rice miller	1	1	-	80	46	10	70	-	11	48	100	45	412
Shoe repairing	5	-	-	13	25	5	18	-	8	13	20	7	114
Steel fabrication	-	-	-	2	2	-	6	-	1	-	3	-	14
Tailoring	75	31	10	46	109	32	60	65	22	55	165	30	700
Tinsmithy	12	1	-	6	6	4	8	1	5	9	14	1	67
Watch repairing	11	1	1	10	13	4	11	-	1	4	14	9	79
Beauty parlour	-	-	-	-	-	-	-	-	-	-	1	-	1
Total	321	148	31	339	461	163	401	283	102	322	606	180	3357