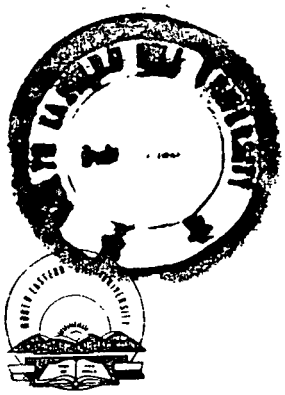
THE REGIONAL STRUCTURE OF MIZORAM

LALRINTLUANGA PACHUAU

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF

MASTER OF PHILOSOPHY IN GEOGRAPHY



DEPARTMENT OF GEOGRAPHY
SCHOOL OF ENVIRONMENTAL SCIENCES
NORTH-EASTERN HILL UNIVERSITY
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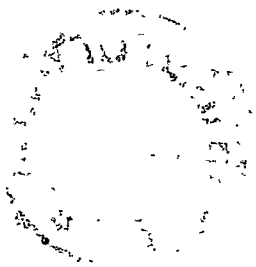

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C E R T I F I C A T E

This is to certify that the dissertation entitled, "The Regional Structure of Mizoram" submitted by Lalrintluanga Pachuau at the Department of Geography, North-Eastern Hill University, Shillong, for partial fulfilment of the degree of Master of Philosophy(M.Phil) is a bonafide work to the best of my knowledge and belief. All the extracts and ideas of other studies have been referred. It may, therefore, be placed befor the examiners for due evaluation.

R.K.Rai
(Prof.R.K.RAI)
Supervisor.

Dated Shillong,
the 15th Dec., 1987

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Shillong,
The 15th....Dec.,1987.

Rinttuanga 15/12.
(LAIRINTLUANGA PACHUAU)

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C O N T E N T S

CHAPTER I

INTRODUCTION

The term 'region' that a regional geographer is concerned with, usually means the two dimensional space on the surface of the earth, where one finds similarity, coherence in the distribution of geographical elements. In the words of B.A.Botkin, "A region is the geographers' term for environmental type in which the geographic elements are arranged in certain definite and constant relations".[1] The geographic elements, such as relief, drainage, climate etc. and including the man and his activities, all combined form a region which in turn forms an environment for man and determine his activities.

One of the purposes of the study of regional structure is to regionalize the distribution pattern of the various elements and to find out sub-regions for a better understanding. It also aims at looking into the biotic and non-biotic resources that the micro-regions possess. Thus, the regionalization ultimately aims at helping the regional planners, who plan for a better regional development as well as to minimize the regional disparities.

REVIEW OF PREVIOUS LITERATURES:

There has been a very little work on Mizoram as far as knowledge on regional geography of India is concerned.

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1. Misra, R.P.(Ed),Regional Planning, University of Mysore, 1969.p.11.

This may be due to the lack of detailed geological and topographical maps, aerial photographs and statistical accounts on various aspects. Most of the literatures available are based on historical and sociological backgrounds though some geological descriptions on a very limited areas have been made.

The first available report for the geology of southern part of Mizoram was presented by La Tauche in 1861.[2] Later, Munshi (1964)[3] mapped the rocks of central part of northern Mizoram. In the recent past Nandy Mukherjee and Majumdar (1972)[4] recasted stratigraphy and gave sedimentation behaviour and the tectonic history of the central part of Mizoram by conducting geological traverses. The goelogical mapping of western part of Mizoram and southern Mizoram was also done by Nandy, Sarkar, Saxena and Mukherjee (1973)[5]. Geological mapping in parts of Lunglei district, Mizoram was also done by Saxena and R.N.Mukherjee(1973).[6]

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2. La Tauche (1891); Note on the Geology of Lushai Hills - Records of the Geological Survey of India, Vol.XXIV part 2.1891.

3. Munshi(1964),Geological mapping in parts of Mizo District , Assam (Progress Report for 1963-'64)G.S.I.

4. Nandy, Mukherjee and Mazumdar(1972), Geological mapping and mineral survey in parts of Mizoram(Progress Report for 1971-'72 field season).G.S.I.

5. Nandy, Sarkar, Saxena and Mukherjee (1973), Geological mapping of western part of Mizoram, G.S.I.

6. Saxena and Mukherjee: Geological Mapping in parts of Lunglei District,Mizoram. G.S.I.Misc.Pub.1973.

It may be mentioned here that no full detailed geological map is available for the whole Mizoram and is not given in the present dissertation.

The first botanical survey was carried out by A.T.Gage(1899)[7] who made a botanical excursion in the spring of 1899 to a portion of the southern part of Mizoram. R.L.Singh (1971)[8] also described a brief account on the physiographic and climatic influence upon the distribution of settlements in Mizoram.

Description of topographic features of Mizoram is numerous but incomplete because most of the existing literatures are deveoted to historical and social studies. Social aspects such as culture, tradition and administration are to be seen in the writtings of Thomas H.Lewin(1912)[9]

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7. Gage, A.T(1899): A Botanical Tour in the south Lushai Hills, Firma KLM, Private Ltd. First Indian Edition. 1978.

8. Singh, R.L.(1971) - India, A Regional Geography. Silver Jubilee Publication,National Geographical Society of India.

9. Thomas H.Lewin(1912): A Fly on the wheel, Printed and Published by Firma KLM Private Ltd.(Reprint 1977).

A.G.Mc Call(1940)[10], A.S. Reid (1893)[11], T.Gougin (1980)[12] Liangkhaia(1938)[13], C.A.Soppit (1976)[14], Hranglien Songate (1977)[15] and L.B.Thanga (1978)[16] etc. Recently, P.Rinawma[17] in his doctoral thesis, studied Geomorphology and agricultural development in Lunglei district of Mizoram and is the only geographical analysis carried out in Mizoram so far.

Hence, the geographical analysis of the region various aspects are of great importance as it will bring out geographical knowledge of Mizoram, which at present,

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10. Mc Call,A.G.(1949). Lushai Chrysalis, Printed and published by Firma KLM Ltd. (Reprint 1977).

11. Reid A.S(1893), Chin-Lushai Land, Printed and Published by Firm KLM Pvt.Ltd.,(Reprint 1976).

12. Gougin T(1980): Discovery of Zo land, Zion Street Churachandpur.

13. Liangkhaia(1938): Mizo chanchin, Aizawl 1938.

14. Soppit, C.A: A Short Account of the Kuki-Lushai Tribes, Aizawl(Reprint 1976).

15. Songate, Hranglien(1977) Hmar chanchin (Hmar History), Churchandpur, Manipur (Reprint 1977).

16. Thanga L.B.(1978): Mizos: A Study in Racial Personality, Gauhati. United Publishers, 1978.

17. Rinawma, P.(1986): Geomorphology and Agricultural Development in Lunglei District. Mizoram.

is the least known portion so far as regional geography of India is concerned.

OBJECTIVE: The objective of this study is primarily to describe and analyse the various geographical aspects which are responsible for its regional structure. The term "regional structure" as used in the present context refers to the spatial pattern of physical, economic, demographic and social characteristics and settlement structure in the study area. However, these aspects of regional structure are taken for which data and information is available . Though the present study is analytical in nature, it is important because it helps in identifying the regional patterns of the above mentioned geographical attributes and the problems pertaining to their development with a view to suggest measures for the development of the region.

SALIENT FEATURES OF THE STUDY AREA:

Mizoram lies between 21°56'N and 24°31'N Latitudes and 92°16'E and 93°26'E Longitudes. The Tropic of Cancer runs across the State. It occupies the north east corner of India. The State of Mizoram has a total area of 21,087 square Kilometres. Its share is only 0.64 percent of India's area as a whole.

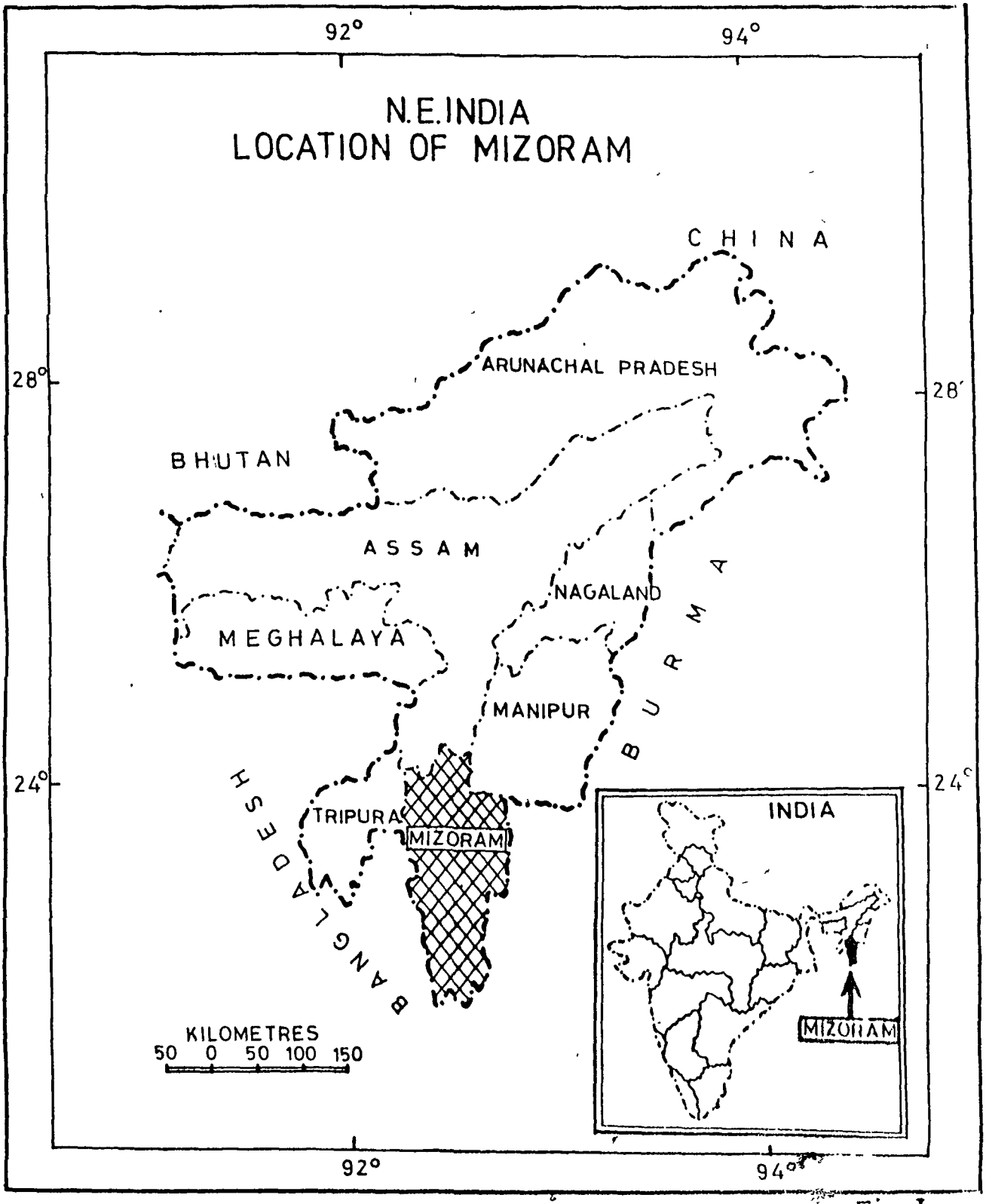
92°
94°
N.E.INDIA
LOCATION OF MIZORAM
CHINA
28°
ARUNACHAL PRADESH
BHUTAN
ASSAM
NAGALAND
MEGHALAYA
MANIPUR
BURMA
24°
TRIPURA
MIZORAM
BANGLADESH
KILOMETRES
50 0 50 100 150
INDIA
MIZORAM

Fig. I.

Mizoram is bounded in the north by Cachar district of Assam and the State of Manipur, in the east and south by Chin Hills of Burma, and in the west by Chittagong Hill tracts of Bangladesh and the State of Tripura. Mizoram occupies a great strategic importance in the north east corner of India. It has a total of 1,632 Kilometres boundary with Burma and Bangladesh.

For administrative purpose Mizoram is divided into three districts of Aizawl, Lunglei and Chhimtuipui. Aizawl district has the largest area of 12,588 square Kilometres, Lunglei district has an area of 4,536 square Kilometres and Chhimtuipui district has 3,957 square Kilometres. Aizawl district is sub-divided into four sub-divisions - namely Aizawl (Sadar), Kolasib, Champhai and Mamit. Lunglei District is divided into two sub-divisions of Lunglei and Tlabung, while Chhimtuipui district is divided into three sub-divisions of Saiha, Lawngtlai and Chawngte.

For developmental operations the region is again sub-divided into twenty Community Development Blocks. They are: Lokicherra, W. Phaileng, Kelsih, Thingdawl, Darlawn, Tlangnuam, Aibawk, Serchhip, Thingsulthliah, Ngopa, Khawzawl, E. Lungdar (Aizawl district), West Bunghmun, Lungsen, Hnahthial, Lunglei, (Lunglei district), Chawngte, Lawngtlai, Sangau and and Tuipang (Chhimtuipui district).

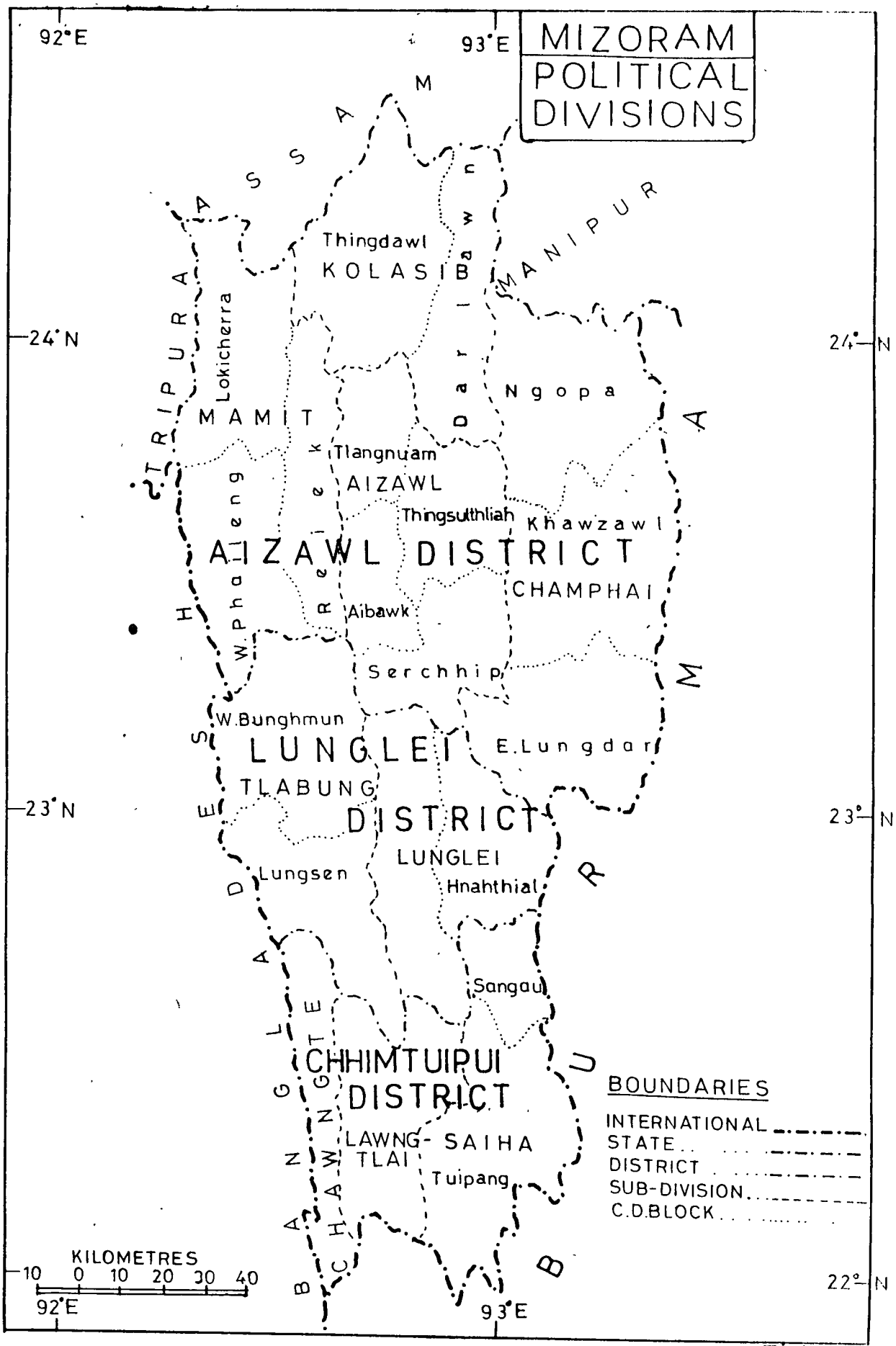
MIZORAM
POLITICAL
DIVISIONS
92°E
93°E
24°N
23°N
22°N
TRIPURA
ASSAM
MANIPUR
Thingdawl
KOLASIB
Lokicherra
Dar
Ngopa
MAMIT
Tlangnuam
AIZAWL
Thingsulthliah
Khawzawl
AIZAWL DISTRICT
CHAMPHAI
Aibawk
Serchhip
W.Phaileng
W.Bunghmun
LUNGLEI
E.Lungdar
TLABUNG
DISTRICT
LUNGLEI
Lungsen
Hnahthial
Sangau
CHHIMTUIPUI
DISTRICT
LAWNG-
TLAI
SAIHA
Tuipang
BOUNDARIES
INTERNATIONAL
STATE
DISTRICT
SUB-DIVISION
C.D.BLOCK
KILOMETRES
10 0 10 20 30 40

Fig. 2.

Mizoram was then known as Lushai Hills district as one of the districts of Assam till it became Union Teritory on 21st January, 1972. Political disturbance broke out in 1966 in Mizoram and declared Disturbed Area till the passing of the Constitution (53rd) Amendment Bill and the State of Mizoram Bill (1986) by the Parliament on 7th August 1986. Consequent upon these Bills, Mizoram was conferred Statehood on the 20th February, 1987 and became the 23rd State of the Indian Union.

The physical conditions of Mizoram is characterised by parallel mountain ranges running North to South. Deep river valleys and drainages interspersed the mountain ranges. The valleys are wider in the western part with lower altitude where ranges rise higher in the eastern part. The topographic feature has been responsible for the overall economic condition of the region.

The population of Mizoram according to 1981 Census is 4,93,757 persons. The rural population accounts for about 75 percent and the rest live in urban areas.

Economically, Mizoram is one of the backward states in India where agricultural economy prevails. The traditional jhuming (shifting) cultivation is the dominant method of cultivation which is far from satisfactory in terms of production. Other economic activities such as industries, manufacturing, mining etc. are insignificant developed or absent.

DATA BASE:

The statistical data and records of Mizoram available at present are quite insufficient to assist a reliable study of the region at micro level. The data for the present study has been collected mainly from secondary sources at district and block level. The materials for physical aspects such as geology, relief, drainage etc. are based on the records and maps available in Geological Survey of India and Survey of India. The maps presented in this dissertation are based upon the Survey of India Maps 1984. The data for demographic structure, i.e., population growth, distribution and density, literacy, sex-ratio, linguistic groups, tribal population, migration etc. are based on the Census of India 1981, Series No.31. Mizoram, Primary Census Abstract, General population Tables and District Census Handbook. The occupational structure analysis is also based on Census of India 1981 series No.31, Mizoram. The data for agricultural activities and rainfall etc. are collected from various government offices such as Directorate of Agriculture, Aizawl, District Agriculture Officer, Saiha, Directorate of Industries, Aizawl, Directorate of Economics and Statistics, Aizawl, Animal Husbandry and Veterinary Office Aizawl. The analysis of transport and communication network is based on the

records of Public Works Department, Mizoram Government Statistical Handbook of Mizoram 1981, 1983 and 1985 and Directorate of Supply and Transport Department, Aizawl, Mizoram.

METHODOLOGY: Suitable cartographic methods and techniques have been applied wherever necessary. Analysis of settlement pattern is carried out from consultation of available topo-sheets on the region. The great difficulty faced by researcher was in getting a systematic data on different aspects. As such the analysis are done mainly at District level corresponding to the availability of statistics. And the researcher feels it necessary to supplement it with photographs and certain plates are attached in this dissertation. However, the present attempt is an effort in empirical analysis using various geographical approaches and tools to arrive at a suitable conclusion:

PLAN OF STUDY: The dissertation is divided into five chapters. The first chapter is an introductory part, revealing the salient features of the study area, objective, data base and format of the dissertation.

The second chapter deals with the regional variation in physical aspects such as geology, topography, drainage, climate, soil and natural vegetation.

Chapter three deals with demographic and social structure. Various demographic and social attributes such as population growth, distribution and density, sex-ratio, literacy tribal components, linguistic group, religion and migration etc. have been analysed at both district level and for rural-urban population.

Chapter four is focussed on the economic conditions of the region. The occupational structure, agricultural activities, industries, and development of power and forestry etc. are described and analysed.

The fifth chapter is concerned with transport and communication network and settlement patterns. Attempt has been made to examine road pattern, accessibility and density of passenger traffic flow. The spatial distribution of settlements is also discussed in this chapter.

Conclusions and suggestions have been given in the end.

CHAPTER II

PHYSICAL ASPECTS

GEOLOGY:

The geology of Mizoram has not been studied in detail due to rugged inaccessible terrain, which is thickly covered by forests. A very little work has been done in the geological exploration of the region. The hills of Mizoram consist of sandstone and shales of Tertiary age thrown into long folds. The rocks are continuation of southwards of those rocks forming the Patkai range and Cachar hills and were probably laid down in the delta or estuary of a large river issuing from the Himalaya in the Tertary period. Marine fossils of that age have been found near Lunglei town embedded in nodular dark grey sandstone.

The general geology is represented by a repetitive succession of arenaceous and argillaceous sediments which were later thrown into approximately NNW-SSE trending longitudinal plunging anticlines and synclines.[1]

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1. Satellite Remote Sensing Survey of Natural Resources of Mizoram; National Remote Sensing Agency 1979 Report Vol.I p.20.

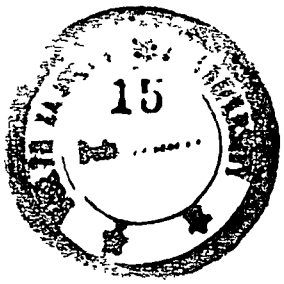
The generalised stratigraphic succession based upon the work of Geological survey of India is as follows:-

TABLE No. 2.1

Generalised Geological Succession in Mizoram

Geological Age	Group name	Formation name	Rock type.
1	2	3	4
Recent Pleistocene	-	Alluvium	Mainly in river bed.
		unconformity	
Mio-Pliocene	Surma	Bokabil	Shale, Siltstone, Mudstone and little Sandstone.
Oligo-Miocene	Surma	Upper Bhuban	Mainly sandstone and siltstone and little shale.
		Middle Bhuban	Mainly Shale and Siltstone.
		Lower Bhuban	Mainly hardstone.
Oligocene	Barail	Barail	Predominantly Shale, Siltstones and grey wackes etc.

The rocks of the Surma groups are exposed in the western part of the State and show typical ridge and valley type of topography and trellis drainage pattern. Coupled the



dominance of trend lines, this unit could be easily separated from the Barail group of rocks which are exposed in the eastern part of the State, showing dendritic drainage pattern and denudation hills oriented in different directions.

In the north eastern corner along with the border with Burma rocks show North-South linear trend and sub-parallel mountaineous ranges and valley type of topography. This is due to the alteration of hard stone and soft shale beds, grouped under Barail group.[2]

1. SURMA GROUP:

Surma group consists of two main sub-groups of rocks which are (a) Bhuban and (b) Boka Bil. Bhuban sub-group is sub-divided into three formations which are as follows:

(i) Upper Bhuban Formation.
(ii) Middle Bhuban Formation, and
(iii) Lower Bhuban Formation.

(i) Upper Bhuban Formation: This formation underlies conformably the Boka Bil formation, the contact in most cases is gradational. This rock formation covers very wide area, it rather covers the whole hill ranges of Central region. The rock formation is predominentaly arenaceous and comprised mostly of massive, brownish, comparatively size

2. Sanker K. and Nandy D.R.(1976): Structure and Tectonics of Tripura-Mizoram area, India, G.S.I. Miscellaneous Publication No.34 Part I, p.141-145.

friable, somewhat weathered, medium grained sandstone usually containing fragments and patches of shale.

(ii) Middle Bhuban Formation: This rock formation overlies the upper Bhuban formation conformably the contact being graditional. It is exposed mainly in the synclinal core of Mat and Tuichang river and Mengpui and Ngengrual stream in the southern part of the state. The rock formation is predominantly argillaceous and comprised mostly of shale, mudstone and Siltstone.

(iii) Lower Bhuban Formation: Lower Bhuban formation comprises mostly of greyish, fine to very fine grained massive sandstone. This rock formation is found in the eastern part of Lunglei district bordering Burma. This rock type is exposed in the anticlinal core of the Darzo hill ranges where rock exposure is clearly visible. At places there are well bedded, hard compact, fine to very fine-grained sandstone bands interbedded with comparatively thiner bands of siltstone and shale.

(iv) Boka Bil Formation: The rocks belonging to this formation occur conformably over the Upper Bhuban and their contact is transitional. It is represented by soft, friable loosely packed medium to fine felspathic sandy grey wacke, sandy shale with interlaminated silt or shale alternation. This type of rock is widely exposed in the western part of the

region along Tuichawng, Tuilianpui, Kau and Phairuang rivers synclines.

2. BARAIL GROUP:

Barail group rests conformably on the Surma group. This rock formation is exposed in a small patches in the north eastern corner of Lunglei district, in the anticlinal core of Thingsai hill. The Barail group is mainly composed of arenaceous rocks. This group of rock is lithologically dissimilar from those of the Bhuban formation lying in the west. The Barails comprised monotonous sequence of weathered shale, interbedded and interlaminated with siltstone, exhibiting weathering pink, violet, greenish grey and white colourations. They enclosed bands of weathered micaceous, felspathic, soft, medium grained sandstone. Unlike Bhuban the Barails contain few sedimentary structures like flute casts. The rocks have low rolling dips and have been folded into a broad anticline with the axis trending approximately east-west.

REGIONAL STRUCTURE AND TECTONICS

Structurally the region is characterised by series of low plunging anticlines and synclines. The study[3] of

3. The analysis of Regional structure and Tectonic of Mizoram has been extracted from the notes of Satellite Remote Sensing Survey of Natural Resources of Mizoram: Natural Remote Sensing Agency, 1979 Rept. Vol. I p.23-24.

trend lines clearly indicates that the folds are asymmetrical , light and compressed in nature. The axial plane of these folds are vertical to sub-vertical with fold axes plunging both towards south and north at low angles. The important features of this folding is that there are number of lineaments parallel to the regional tectonic trend. This fold is very dominant in western part of the area. In the eastern part of Mizoram, trend lines are not seen over long distances due to massive or soft nature of rocks and hence delineation of exact nature of folding is rather difficult. From the curved nature of the fold axes, change in plunge direction and general swerving of trend lines, it seems second generation of folding might have taken place. This folding might have developed due to the adjustment in the basement blocks on which Tertiary sediments were deposited.

Broad Lithologic Units: Based on image elements, geologic features and geomorphic features three broad lighthologic units have been identified, and the relationships between the units have been worked out as follows:-

TABLE No. 2.2.

Group Name	Unit	Lithology	Age
Surma	Bokabil	Predominantly thin bedded, shales, friable sandstone and occationally alternating with compact fine sandstone sands.	Mico-Pliocene

	Bhuban	Predominantly alternating sequence of sandstone and shale; At places massive sandstone bands.	Oligo-Miocene.
Barail	Upper Barail	Predominantly shale, siltstone, and soft sandstone Occasionally compact, hard sandstone bands present.	
	Lower Barail	Alternating sandstone and shale.	

PHYSIOGRAPHY

The State of Mizoram has predominantly of mountaineous terrain of Tertiary origin. The mountain rangès fun north to south direction in parallel series . These ranges are separated from one another by narrow and deep river valleys, with only a very small portion lying in the plains.

The terrain of Mizoram is young and immature. It shows prominent relief features with steep slope and is still undergoing denudation in response to various exogenetic (isostatic gravity) process. Since the terrain is young, the geomorphic features of the State do not show much diversity in the formation of landforms. Most of the landforms observed are of an erosional nature. The most dominant

process in evolution of these forms is the action of running water and is operating from upper Tertiary onwards, till today.[4]

Based upon relief, drainage, lithologic and structural set up, and the dominant processes operating upon geologic base along with climate and time, landform of Mizoram have been interpreted on Landset Imagery and classified into following units.[5]

(a) Mountaineous Terrain Province:

The eastern part of the State has been classified as mountaineous terrain province. The overall relief in this province is higher and the slopes are much more steeper than in the western part. The relief here varies between 400-2158m. The high points are generally over 1000m. Average elevation in this province is the order of 1500m. The slopes are very steep and elevation difference between hills/ridges top and valleys varies between 200-600m. The ranges are mostly aligned in north-south direction. The important mountain ranges in Mizoram can be briefly mentioned as follows:-

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4. Satellite Remote Sensing Survey of Natural Resources of Mizoram; National Remote Sensing Agency,1979 Vol.I p.25.

5. Ibid p.26.

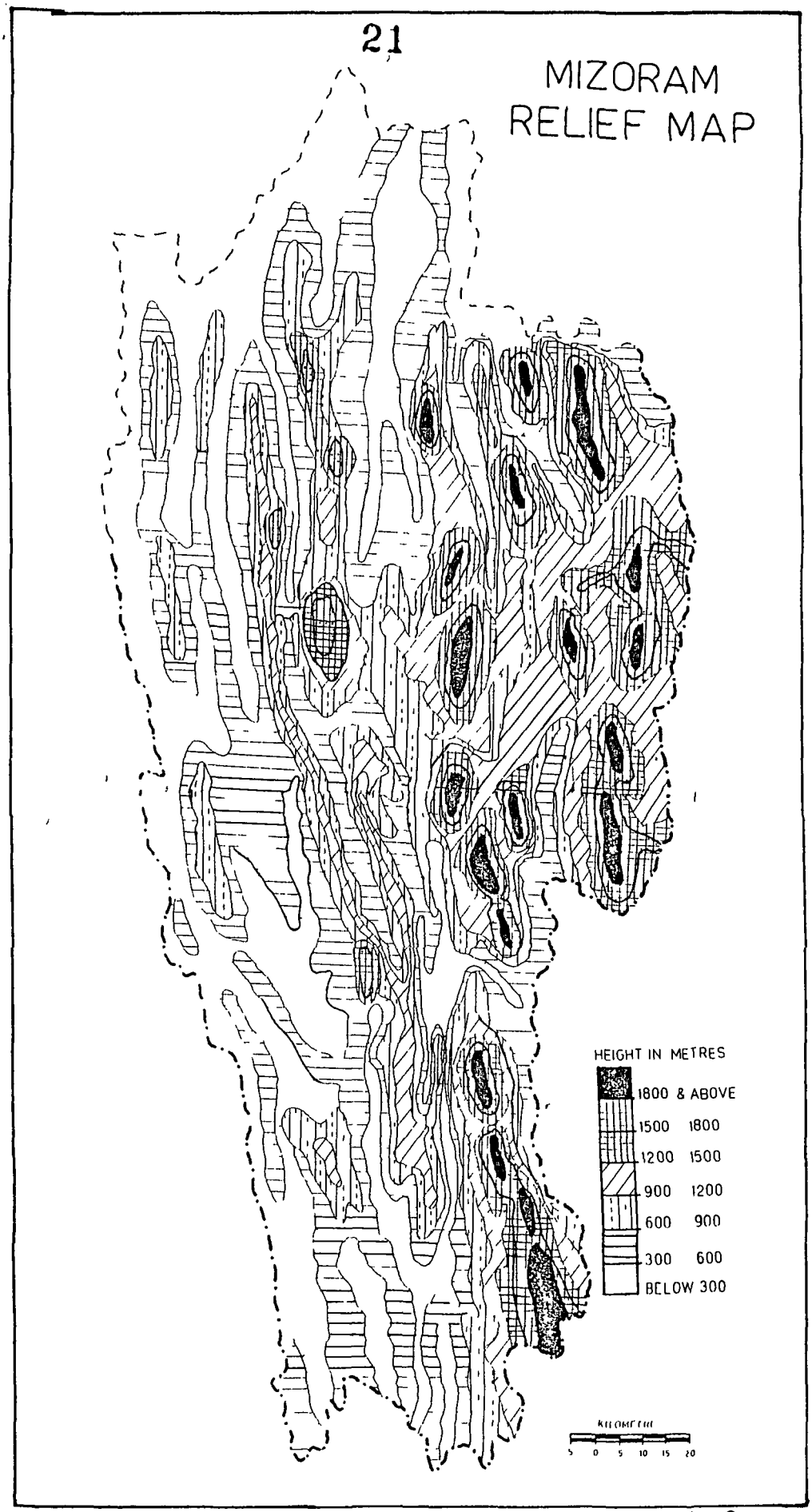
MIZORAM
RELIEF MAP
HEIGHT IN METRES
1800 & ABOVE
1500 1800
1200 1500
900 1200
600 900
300 600
BELOW 300
KILOMETRE
5 0 5 10 15 20

Fig. 3.

In the north east corner runs Sialkal Range. The highest peak of this range is called Lengteng which stood at 2149 metres above sea level. The other peaks are Naunuarzo and Sur with the height of 2140 metres and 2018 metres respectively. In the south-eastern corner of Aizawl district, Zopui (1964m), Tan(1927m) and Lurh(1936m) form a series of mountain ranges. In the central part of Aizawl district there are Chalfilh Range and Tawi Range with the elevation of 1905 metres and 1888 metres respectively. The other important ranges are Mawmfang located in between Chalfilh and Sialkal range in Aizawl district, Hmuifang Range in the central part of the region and Reiek Range situated at west of Aizawl mountain. Purun and Thorang are important ranges in Lunglei district. Phawngpui (also known as Blue Mountain) with an altitude of 2158 metres lying in the eastern part of Chhimtuipui district is the highest peak in Mizoram.

The drainage either flows north or south due to overall structural and lithologic control on the drainage. Large scale structural control is evident. Due to relief and moderately heavy precipitation, the dissection is very high. The width of the valley increase both towards south or north.

(b) Ridge and Valley Provinces:

The western part of the State shows characteristic ridge and valley type topography. Nearly half the area of the State is covered by this province. The relief in this province varies between 40-1550 metres and the average elevation is 700 metres. The relief is lower in the western part and increases towards east. The hill trend is approximately NNW-SSE to NNE-SSW direction, higher in central part and tappering towards north and south. The slopes are generally steep and elevation differences between valley floor and hill top is the order of 100-200 metres.

The flat lands: There are only few patches of flat land in Mizoram. There are intermont valley plains located in the midst of hills and narrow valleys. These plains are believed to have been formed in the beds of silted up lakes as they are covered by rich alluvial soils.

The largest plain in Mizoram in Champhai(Plate No. A), located at the eastern border at a distance of about 195 km east of Aizawl. Champhai plain has a length of 11.27 Kilometres and the widest part is 4.83Kilometres across. The whole area of this plain is now under permanent wet rice cultivation. The second largest plain is situated at Vanlaiphai (N) in the south eastern corner of Aizawl

district and Thenzawl in the south of the district. Mention also may be made to numerous small plains at Tuisen hnar near Khawzawl Village in the east. Zawlpui by the side of Mat river, Phaisen and Chhimluang, west of Bilkhawthlir village in the north, Hortoki and Bairabi along the river banks of Tlawng. There is a vast plain area situated at Chamdur in the south western part of Chhimtuipui district. The area is covered with thick forest and . attempts have been made to exploit this area for permanent rice cultivation.

The Lakes: There are only few lakes in Mizoram. The three largest lakes are Palak, Tamdil and Rengdil. Other lakes are Rungdil, Vachadil, Most of these lakes are situated in high altitude. Among these, only Tamdil 100 km east of Aizawl has been developed and created as the most important and productive fish-pond managed by the State Government.

DRAINAGE:

There are numerous rivers and streams in Mizoram. Most of them are of ephemeral in nature, depending on the monsoon rains. Their volume is very limited in dry seasons whereas they swell rapidly in rainy season.

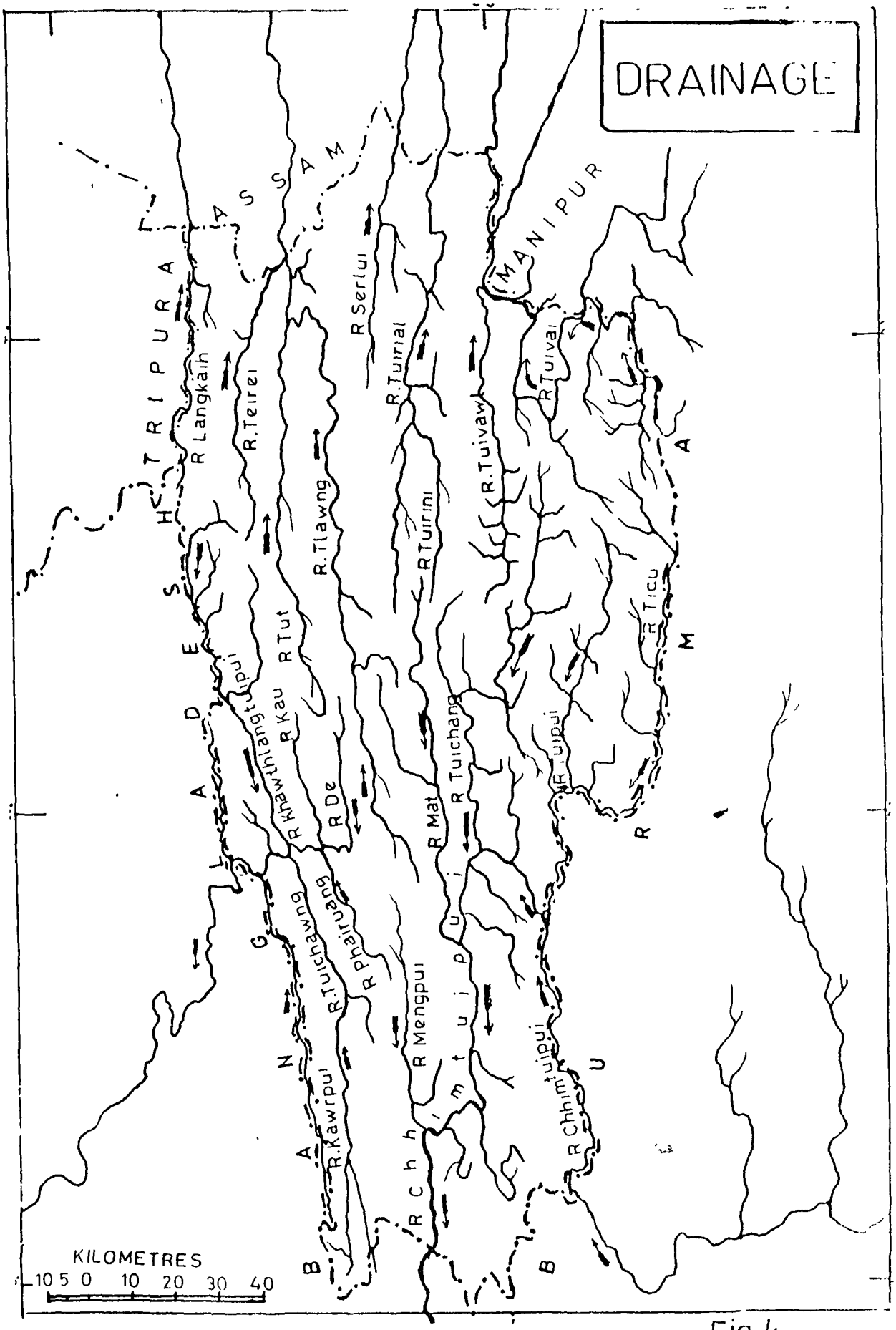
DRAINAGE
TRIPURA
ASSAM
MANIPUR
R Langkaih
R.Teirei
R Serlui
R.Turial
R.Tuivawl
R.Tuival
R.Tiau
R Khawthlangtuipui
R Kau
R Tut
R.Tlawng
R Turini
R De
R Mat
R Tuichang
R.Tuipui
R.Tuichawng
R Phairuang
R Mengpui
R.Kawrpui
R Chhimtuipui
KILOMETRES
10 5 0 10 20 30 40

Fig.4.

The most of the drainage line originated in the central part of the area and flow either towards north or south, controlled by the north-south trending ridges. The valleys are narrow and have been carved out in softer formations. The rivers at various places formed deep gorges and cut across the strike ridges forming watergaps. Waterfalls in the upper courses are common, as the drainage course is controlled by the parallel ranges the drainage of ephemeral and consequent type show trellis, dendritic, rectangular as well as parallel drainage patterns. The drainage of Mizoram is shown in Fig.4.

The northern portion of the region is drained by rivers, Tlawng (with its tributaries Teirei and Tut), Tuivawl, Tuirial, Langkaih and Tuivai, all flowing northwards and eventually fall into Barak river in Cachar Plain of Assam. The southern hills are drained by rivers Chhimtuipui on the east with its tributaries Lat, Tuichang, Tiau, and Tuipui; while Khawthlangtuipui with its tributaries Kawrpui, Tuichawng, Phairuang, Kau and De form and western boundary with Tripura and Bangladesh, whereas the rivers Tiau and Chhimtuipui form the natural boundary line with Burma in the east.

The important drainage systems are as mentioned below:
1) Tlawng drainage system: The river Tlawng is the longest river in Mizoram which measures about 102 kilometres inside

the region. It originates from Zopui hill some 8 Kilometres to the east of Lunglei town at the height of about 1395 metres. It flows towards the north dividing the region into almost two equal parts. After its tributaries Tut and Teirei confluence it from the western bank it enters Cachar district (where it is known as Dhaleswari) and eventually falls into Barak river near Badarpur. The river is navigable by small boat throughout the year and is regarded as the most useful river of the whole Mizoram. The Tut and Teirei rivers flow in parallel with the river Tlawng for about 60 Kms and 40 Kms respectively before their confluence.

2) Tuirial Drainage system: This river is also navigable by small boat to a considerable length. Its length inside the region is about 67 kilometres. Flowing towards north it enters into Cachar where it falls into Barak river. An important tributary is Tuirini which joins it from the eastern bank after flowing in parallel to the main stream for about 29 Kilometres.

3) The Tuivawl Drainage system: This system drains the north east portion of the region. The main river Tuivawl which rises near Chhawrtui village flows towards north where the tributary R.Tuivai joins it at Manipur border. It eventually confluents to Barak river.

4) The Tiau Drainage system: The Tiau drainage system drains the eastern part of Mizoram. River Tiau which spans for about 83 Kms is a demarcating line between Mizoram and Burma. Rising from the north east corner near Khuangphah village it takes a southward direction. After the confluence with its main tributary R.Tuipui it meets R.Chhimtuipui near Pangkhua village in an opposite direction. The meeting of those rivers gives quite an interesting scene as the two currents encountered with an opposite forces.

5) The Chhimtuipui Drainage system: This system drains the south eastern part of Mizoram. The main river Chhimtuipui originates from the western part of Burma near Vanum village at the height of 2325 meters and flows in south direction. It enters Mizoram near Sabawngte village from which it takes the northern direction along Burma and India border and meets Tiau river just in an opposite direction. Then it turns towards north-west and meets Tuichang river near Hnahthial village and then turns towards south where its tributaries R.Mat and Mengpui river join it. The Tuichang and Mat originate from Aizawl district and flow in parallel for many kilometres. Mengpui, another tributary of Chhimtuipui river rises from Lunglei town and meets the main drainage line in Chhimtuipui district.

6) The Khawthlangtuipui drainage system: The Khawthlang-tuipui represents the western drainage system. Originating from Saithah village in Aizawl district, the Khawthlang-tuipui flows in the southern direction along the border of Bangladesh and Mizoram. After flowing for about 105 Kilometres it turns towards the south-west entering Bangladesh through Tlabung, a Sub-divisional Headquarter.

Khawthlangtuipui has numerous important tributaries such as Kawrpui, Tuichawng and Phairuang which join it from the south; and rivers Kau and De which flows parallel to it from the south. This drainage system shows rectangular and parallel drainage pattern. The river is navigable by small boat and it serves as an useful water transport route as far as trade with Bangladesh is concerned.

CLIMATE:

Mizoram being located on a tropical region enjoys a moderate climate. It is neither very hot nor too cold throughout the year. The region falls under the direct influence of the south-west monsoon as such the region receives adequate amount of rainfall. The climate is humid tropical, characterised by short winter, long summer and heavy rainfall.

TEMPERATURE:

Since there are no proper observatory stations in Mizoram, it is very difficult to study the temperature conditions in the region. The analysis is based mainly on observations of the researcher supplemented by meagre statistical records.

The important characteristic of Mizoram is that the temperature does not flactuate much throughout the year except on the valley sites. The highest temperature is observed in June and July. Thereafter, the onset of monsoon brings down the temperature. The temperature continues to fall with the break of the rains, and the minimum temperature is observed in the months of December and January. In autumn the temperature is usually between 18°C and 25°C while the winter temperature records normally between 19°C and 23°C. The summer temperature is usually between 20°C and 29°C.

In winter the coldest temperatures are recorded at places having high altitudes such as Champhai, Zote, Ngur etc. in the east, Bualpui(NG) and the Phawngpui mountenous areas in the south. The maximum temperature in summer is observed at relatively lower elevation such as Kanhmun, Lokicherra, Bairabi, Vairengte etc. in the northern part, Tlabung, Chawngte, Tuipang etc. in the south. As far as annual range

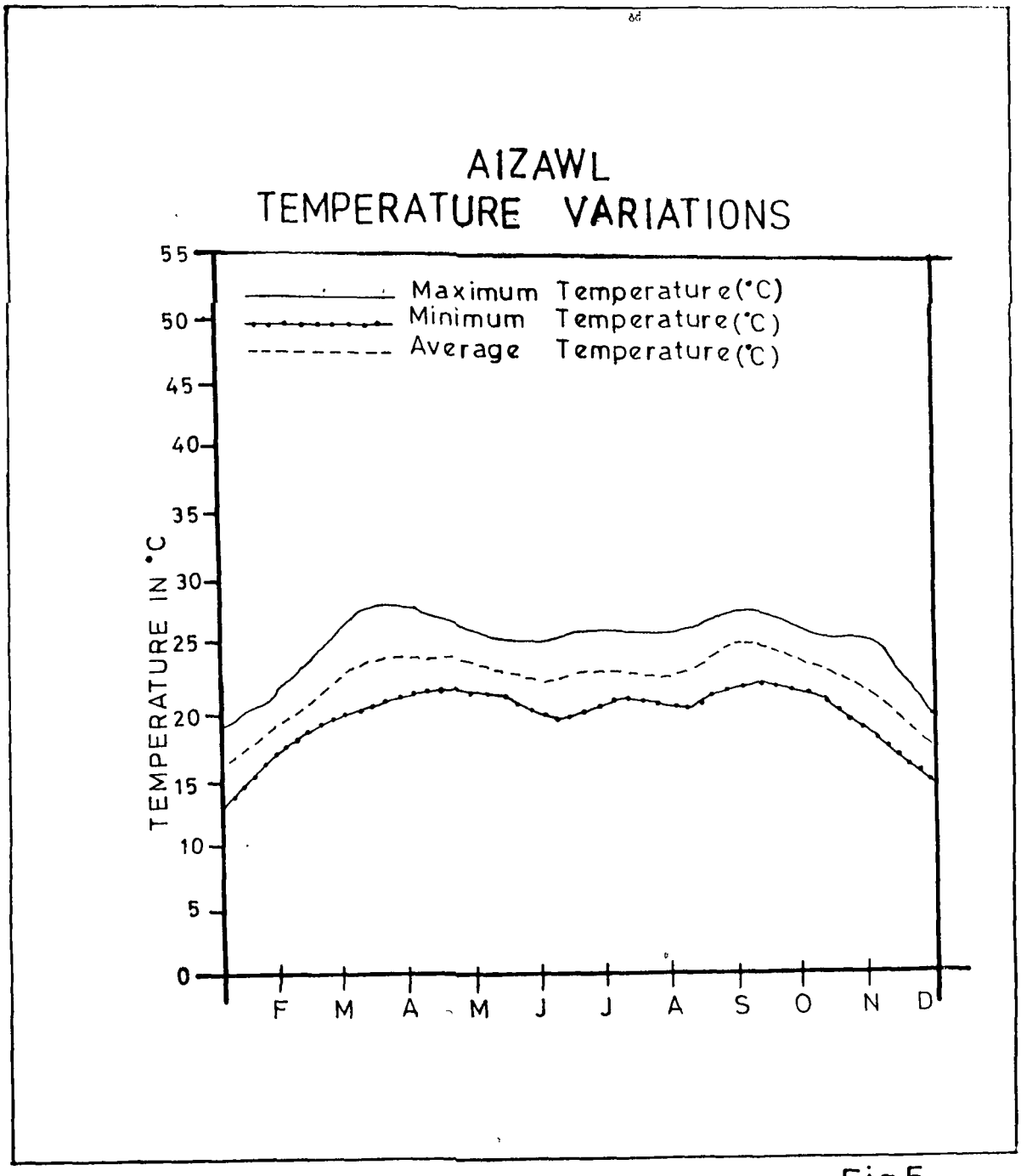
AIZAWL
TEMPERATURE VARIATIONS
Maximum Temperature(°C)
Minimum Temperature(°C)
Average Temperature(°C)
TEMPERATURE IN °C
55
50
45
40
35
30
25
20
15
10
5
0
F
M
A
M
J
J
A
S
O
N
D

Fig.5.

of temperature is concerned, it is to be seen that the places at higher altitudes observed lower range of temperature whilst the places at lower altitudes have higher temperature range.

RAINFALL: The entire Mizoram is under the direct influence of Monsoon. It rains heavily from May to September. The average rainfall for the whole of Mizoram is 250 centimetres annually. The north western portion of the State received heaviest rainfall i.e. more than 350 cms per annum. The rainfall also increases southward with increase in humidity. While Aizawl, located at 23°,44N & 92°43'E receives 208 cm average rainfall, Lunglei records as high as 350 centimetres. The study of the existing rainfall data reveals that the highest monthly rainfall data of Mizoram was recorded in July 1983 with 602.60 mililitres.

It rains heavily in summer, especially from May to September and last till late October. Normally July and August are the rainiest months, while November, December and January are the driest months. A careful study of rainfall data for the last three years i.e., 1984, '85 and '86 reveals that the rainfall has a decreasing tendency. In 1984, the average rainfall for the whole Mizoram is 216 cms. In 1985 it came down to 206 and further falls to 179 cms

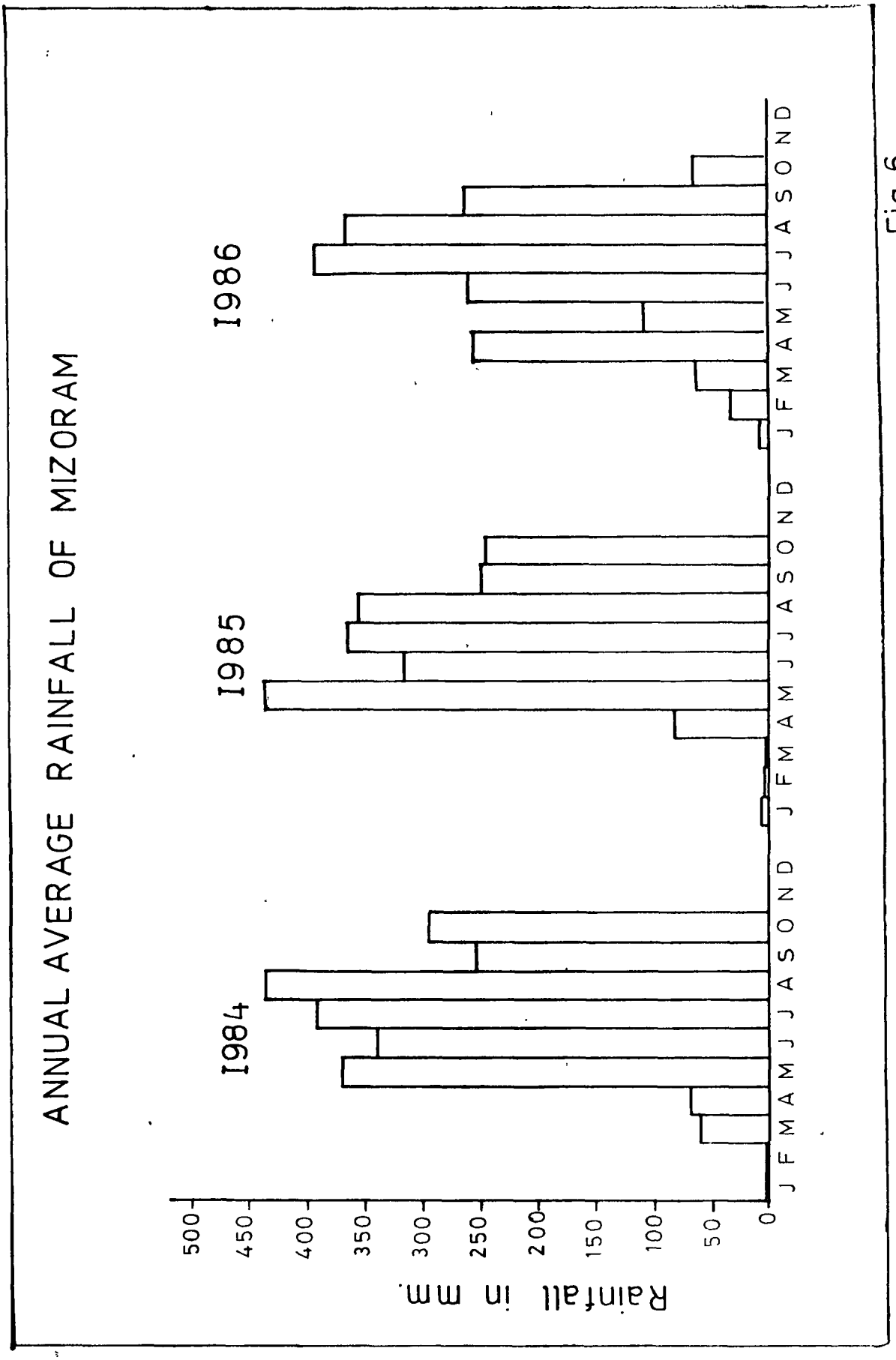
ANNUAL AVERAGE RAINFALL OF MIZORAM
Rainfall in mm.
500
450
400
350
300
250
200
150
100
50
0
1984
1985
1986
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

Fig.6.

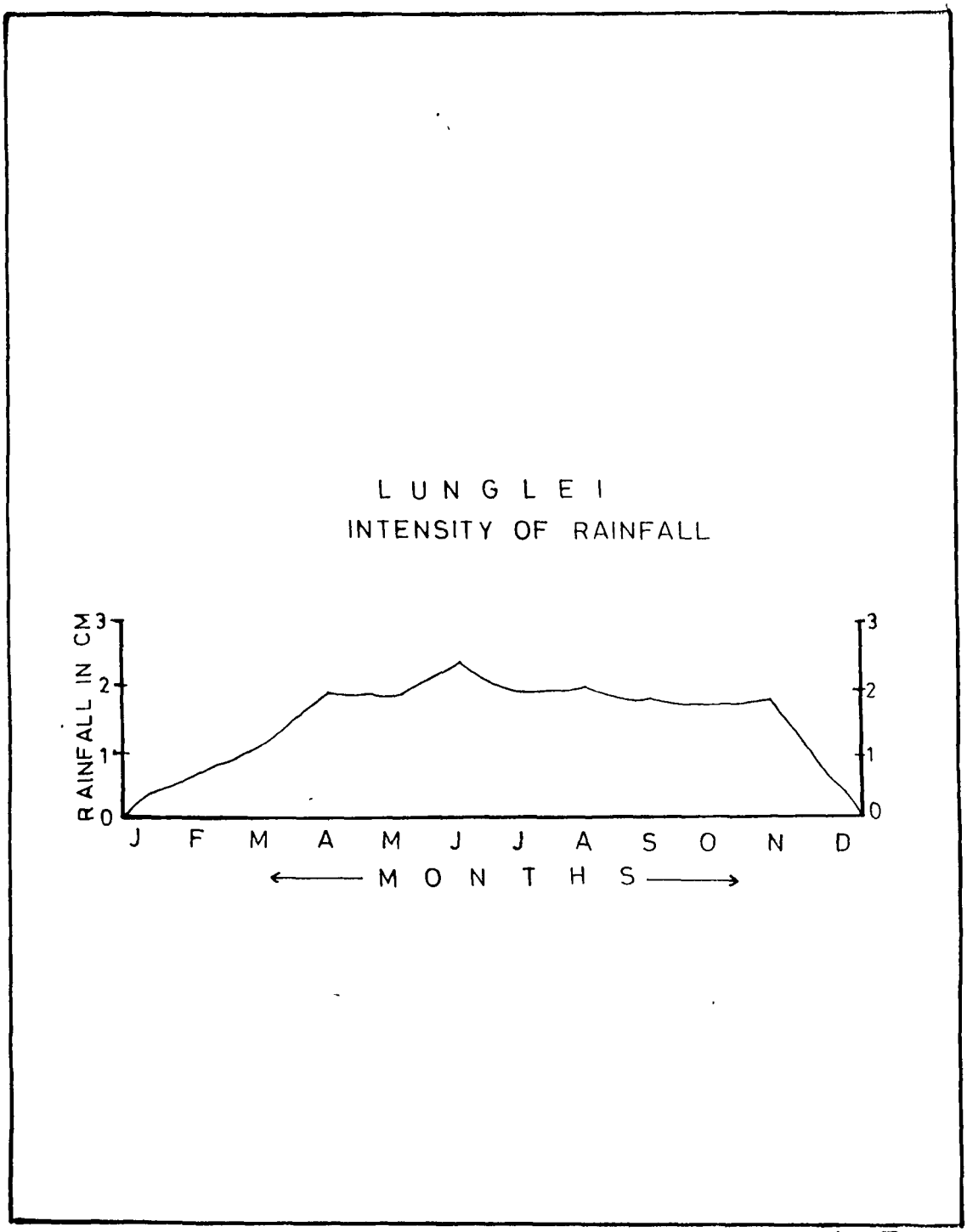
LUNGLEI
INTENSITY OF RAINFALL
RAINFALL IN CM
3
2
1
0
J F M A M J J A S O N D
MONTHS

Fig.7.

in 1986. The reason may be attributed to muddle in the south west monsoon and, probably, the devastating clearance of vegetation in the region. Rainfall data is given in table No. 2.3 and 2.4.

THE SEASONS: The seasonal variation of climatic dondition in Mizoram is insignificant. Yet, three different types of seasons, depending on the change in temperature, can be observed:

1) The Cold Season or Winter.
2) The Warm Season or Spring.
3) The Rainy Season or Summer.

1) The Cold Season: The cold season starts from November and lasts till February. In this season the temperature is comparatively low but not too severe for human habitation. The temperature ranges from 12°C to 20°C . It receives very little or no rainfall and whatever amount of rainfall received in this season is originated from north-east known as retreating monsoon. The season is very pleasant. The sky is clear and wonderfully blue due to absence of cloud covering. Morning midst which formed in between the hills and the valley sites gives an enchanting view of wide stretches resembling a vast lake.

TABLE NO.2.3

RAINFAL STATISTICS OF MIZORAM: 1986

Recording Stations	Monthly Rainfall Data recorded in M.M.												
	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
AIZAWL DISTRICT													
1. Tlangnuam	Nil	18.0	48.0	387.2	105.2	248.2	456.4	324.4	273.0	261.0	-	-	2121.4
2. Phaibawk	3.0	Nil	26.0	209.1	143.0	193.0	602.4	496.4	245.4	164.4	Nil	Nil	2247.1
3. Reiek	Nil	110.0	170.0	924.0	143.0	191.0	222.1	500.2	Nil	Nil	Nil	Nil	2760.5
4. Thingsulthliah	25.0	11.0	21.0	254.0	82.0	81.0	247.0	-	-	-	-	-	968 .0
5. W.Phaileng	5.2	13.3	16.0	12.0	9.4	32.0	270.0	28.4	210.0	-	-	-	1006.3
6. Thingdawl	Nil	18.3	22.0	283.0	63.0	420.1	757.3	499.1	352.0	-	-	-	2866.9
7. Bilkhawtalir	9.2	250	50.0	309.1	180.2	434.4	744.0	553.0	471.4	437.0	-	-	3875.3
8. Lokicherra	7.0	12.0	8.0	366.0	138.5	210.0	389.0	314.0	349.0	Nil	-	-	2142.5
9. Darlawn	6.0	6.4	42.0	337.2	128.0	238.0	344.0	415.0	440.0	209.0	Nil	-	2374.6
10.Ngopa	Nil	12.0	22.0	201.0	88.0	172.0	372.0	443.0	190.0	Nil	-	-	1690.0
11.Khawzawl	1.2	Nil	123.0	390.0	58.0	392.0	420.4	266.0	-	252.0	-	-	2155.0
12.Champhai	19.0	Nil	28.0	127.0	75.0	211.0	278.3	243.0	155.0	-	-	-	1291.3
13.Serchhip	10.0	7.1	10.2	260.3	155.1	261.0	396.0	296.0	301.0	-	-	-	1997.7
14.Sialsuk	5.0	250.0	280.0	473.3	146.0	429.0	729.0	521.0	255.0	-	-	-	3343.3
15.Neihbawi	15.4	14.4	120.0	351.3	246.0	316.0	277.3	350.0	355.4	-	-	-	2600.8
16.Chite firm	13.0	6.0	300.0	352.0	147.0	243.0	392.0	280.0	248.0	-	-	-	2229.0
17.E.Lungdar	17.0	40.0	120.0	95.0	225.0	360.0	370.0	600.0	415.0	32.0	-	-	2689.0
LUNGLEI DISTRICT													
Lunglei	Nil	6.0	9.0	218.0	159.1	446.0	581.0	572.0	737.0	-	-	-	3465.1
Hnahthial	-	-	-	157.0	36.0	116.0	330.0	246.0	460. 0	-	-	-	1805.0
Lungsen	-	-	-	132.0	106.0	164.0	519.0	494.0	419.0	239.0	-	-	2312.0
Bunghmun	-	-	-	-	-	-	-	-	-	-	-	-	-
CHHIMTUIPUI DISTRICT													
1. Saiha	22.1	2.0	8.3	162.0	81.1	400.1	427.0	545.1	368.3	-	-	-	2384.3
2. Lawngtlai	15.3	-	33.4	223.0	-	535.0	425.0	585.1	275.4	-	-	-	2367.5
3. Tuipang	-	-	-	150.4	122.4	339.4	-	-	-	-	-	-	951.6
4. Chawngte	-	-	-	-	-	317.0	-	353.0	-	-	-	-	670.0

2) The Warm Season: The warm season is from March to first part of May, and merges with the rainy season. The temperature has risen upto a range of 19°C-29°C being aggrevated by rainless days. The early part of this season is characterised by bright sunshine and clear sky with little or no cloud till it is disrupted by the coming of the pre-monsoons.

3) The Rainy Season: This is the longest season in Mizoram. It lasted for 6 months starting from the month of May till late October. The season starts with violent storms which swept the region from south west through Bay of Bengal marking the beginning of Monsoon. It rains heavily from May to September. Precipitation is also quite heavy in the month of October. July and August are the wettest months receiving about 39 percent of the annual rainfall. The common characteristics of the summer in Mizoram is heavy outpours in the morning associated normally with hailstorms and thunder. The temperature remains high but is kept down to a considerable extent by the usual rains.

TABLE -NO.2.4

MONTHLY RAINFALL IN MIZORAM

	Rainfall in mm		
	1984	1985	1986
January	4.4	6.5	6.9
February	3.6	3.7	31.0
March	1.8	3.5	58.2
April	69.4	82.6	254.9

-- -	1984	1985	1986
May	369.6	437.1	105.4
June	340.3	315.4	258.5
July	392.9	365.6	389.9
August	437.0	354.0	364.9
September	251.5	248.8	260.9
October	295.5	246.0	63.7
November	Nil	Nil	N.A.
December	0.1	0.2	N.A.

Source- Directorate of Agriculture, Mizoram,Aizawl.

SOIL:

The soils in Mizoram are generally sandstone, shale and limestone and derived soil is red loamy and high level lateritic. The soil acidity is high. They are low in Potash and Phosphorus, Nitrogen content is high in uneroded soil because of organic matter accumulation. The soil in the valleys are heavier as they are brought down by rain water from high altitudes.

SOIL CLASSIFICATION[6]: The soils of Mizoram have been classified under three orders of soil taxanomy, viz.-

1) Entisols.

2) Inceptisols.

3) Ultisols.

6.Sanker K & Nandy D.R(1976):Structure & Tectonics of Tripura-Mizoram area, India G.S.I.Miscellaneous Publication No.34 Part I pp.141-145.

1) Entisols: These soils have little or no evidence of profile development. They occur on steep actively eroding slopes and ridges or on flood plains that receive new deposits of alluvium at frequent intervals. In order of entisols the following soils have been identified at the family level classification:

a) Mixed, Hyperthermic, Typic udipsamments - occur in narrow valleys (river courses) in a very limited area.

b) Loamy skeletal. Mixed, Hypethermic, Lythic Udorthents - occur only in the ridge tops which have been severely eroded due to indiscriminate felling of forests. The soils have coherent strata within 50 cm. Exposed rock sequences are also seen at few places.

c) Loamy skeletal, mixed, hyperthermic, typic Udorthens - These soils have been encountered in erosional areas on ridge tops and terraces. These are found as dominant unit on ridges which are under scrubs. The soils are having 40-60 percent of coarse gravels. These soils can suppport good vegetation if properly managed.

2) Inceptisols: This order of soils occur widely in sub-humid to humid region. The common horizon sequence is an Ochric epipedon over a cambic horizon. Freely drained inceptisols are classified as Ochrepts. The following families of the sub-group typic Dystrochrepts have been identified in Mizoram.

a) Fine loamy, mixed, Hyperthermic Typic Dystrochrepts - commonly occuring on the steep slope, in narrow valleys and on terraces. They are generally covered with dense scrubs or grasses. The soils are fine loamy in texture. They have few rock fragments also.

b) Loamy skeletal, mixed, Hyperthermic Typic Dyatrochrepts - Found on the concave parts of the slopes (in narrraw patches) of hill top ridges. Generally these soils are deep with 40-50 cm thick solum, below which weathered soft rocks are found. They are well suited for forest species.

3) Ultisols: Ultisols are commonly found on the footslopes. The soils have horizons which are rich in translocated silicate clays. The main sub-orders of this soil are a) Aquults, b) Humults and c) Udults.

a) Aquults - Only one family of this sub-order i.e., mixed hyperthermic, fine loamy, typic palequults have been found to exist in Mizoram. It is found in the flat lands.

b) Humults - Only one family of this sub-order have been identified. These soils are rich in humus and support generally rain forest.

c) Udults - Udults order of soils are fairly widespread in Mizoram. They are fairly drained, poor in humus associated with humid climate with high rainfall.

The soils of Mizoram, thus can be described in the following lines.

In the hilly terrain, the slopes are steep to very steep consisting mostly of Hapludults, Paleudults and Palehumults. These soils are highly leached, poor in bases, rich in iron and low in pH value. They have wider occurance as campared to other soil types.

The soils on the top of ridges are mostly shallow or underlain by weathered rock and have thin depth. These have poor moisture supply and are capable of supporting only scrubs of low trees.

In narrow valleys the soils are young and sandy. The extend is very much limited and are of least importance for land use. The soils in flat lands are poorly drained and have high ground water table.

To conclude, as far as soils of Mizoram are concerned, the soils of the region are well drained except in flat lands, and are capable of providing substantial Oxygen supply for plant growth. The soils of the region also have capability to retain soil moisture and maintain its supply throughout the growing season of the normal crop. They have a low inherent fertility in the form of poor supply of bases and mineral reserve. This implies the necessity of inputs.

NATURAL VEGETATION

Mizoram has an abundant growth of vegetation. Out of the total geographical area which is 21,087 sq.km. 15,935.22 sq.km is covered by vegetation which accounts for about 75 percent. Mizoram was once covered by thick forests with numerous species ranging from Tropical trees to sub-tropical, comprising of much valuable timber species, medicinal herbs and domestic resources.

The tropical location of the region supported by adequate rainfall and the prevailing climatic condition favour the luxuriant growth of vegetation. But the vegetation of Mizoram has undergone a serious change due to continuous onslaughts by man, clearance, heavey exploitation and maltreatment by burning and over grazing. The areas which were once covered with thick forests have been replaced by the low vegetable herbs, shrubs and reeds. The following are the major factors responsible for the degeneration of vegetation in Mizoram.

1) Jhuming: The large scale practice of jhuming since the past generation is the main reason that stunted the vegetation in the region. The Mizos, being traditional agriculturists, have to depend on shifting cultivation. The reason is that there is no sufficient cultivable flat lands for settled agriculture, and permanent terrace cultivation can not be practised owing to lack of power

and water supply. As such, there is no alternative other than jhuming or shifting cultivation.

The trees are slashed and burnt off and cultivation is made. After the harvest the cultivator has to select another vegetated area for fresh cultivation. The reason is that the ashes of the dried trees and plants replenish the fertility of the soil. They contain macronutrients like carbon, Hydrogen, Oxygen, Nitrogen, Phosphorus, Potassium, Calcium, Magnessium and Iron.[7] These nutrients are exhausted and eroded after annual cultivation, as such, shifting cultivation is the only alternative. By this process large scale of forests are destroyed and converted into a barren land and replaced by bamboos, shrubs and reeds.

2) Lumbering and fueling: There have been a large amount of timber species in Mizoram. At present most of them have been consumed by lumbering without proper preservation. The use of firewood for domestic requirement since the past has also affected the vegetation.

Attempt have been made to preserve and protect the important species and rare plants. The State Forest Department has been undertaking necessary steps to regenerate the forest areas either naturally or artificially through plantation. Besides the local species, the State Forest Department also introduced in their plantation programme the other species like Teak and Eucalyptus.

7.Jain V.K.: Fundamentals of Plant Physiology. Published by S.Chand & Co. Ltd. Ram Nagar, New Delhi. p.80.

Distribution of forests in relation to geographical characteristics:

The principal factors which influence the geographical distribution of forest in Mizoram are latitude, elevation, moisture and nature of soil. In addition to this there is marked difference in vegetation of western and eastern part of the State. The influence of elevation, soil and moisture is obvious.

The main timber species like Diptercarpus(Lawngthing) Terminalia, Schima Wallichi (Khiang), Antocarpus, Michelia champaca (Ngiau) etc. are found on sandstone, limestone on the crest of the ridges, also on higher slopes. On the other hand Teak thrives well in sandstone and shales towards the western part of Mizoram. Bamboo is available everywhere but intensity is more in the western part of the State. Lower slopes of the ridges and former jhumed areas and also low valley sides are covered with bamboos patches of different growth depending on when the jhum was practised at respective places.

Forest patches where the composition is a mixture of moist deciduous, semi-evergreen and bamboo are delineated as mixed forest. This type of forest is mainly distributed in patches e.g., near Chalfilh range, north of Champhai and Dampa areas.

FOREST TYPE AND THEIR DISTRIBUTION:

Mizoram lies under Tropical zone where different types of forests are found. The forest can be simply described as wooded forests in the higher ridges and bamboo forests in the lower ridges (normally below 600 metres) including reverine and plain areas.

The timber species found in Mizoram are Dipterocarpus (Lawng thing) Terminalia(Char), Artocarpas, Amoora Wallichi (Tatkawng) Sterculia alata, Michelia champaca (Ngiau) Schima Wallichi (Khiang) Gmelina arborea(Thlanvawng) etc.

The main species of tropical semi-evergreen forests are Schima Wallichi (Khiang), Cedrela loona (Tei) and Terminalia (Char)

The simple classification of the vegetation of Mizoram falls under three broad types viz. Tropical Wet Evergreen Forests, Tropical semi-Evergreen Forests, and Montane sub-tropical Forests. By and large, the forest of Mizoram, based on their local variations, can be subdivided into the following:

1) Tropical Evergreen Forests.
2) Sub-Himalayan Semi-Evergreen Forests.
3) Sub-Tropical Pine Forests.
4) Sub-Tropical Hill Forests.
5) Over-lapping bamboo Forests.

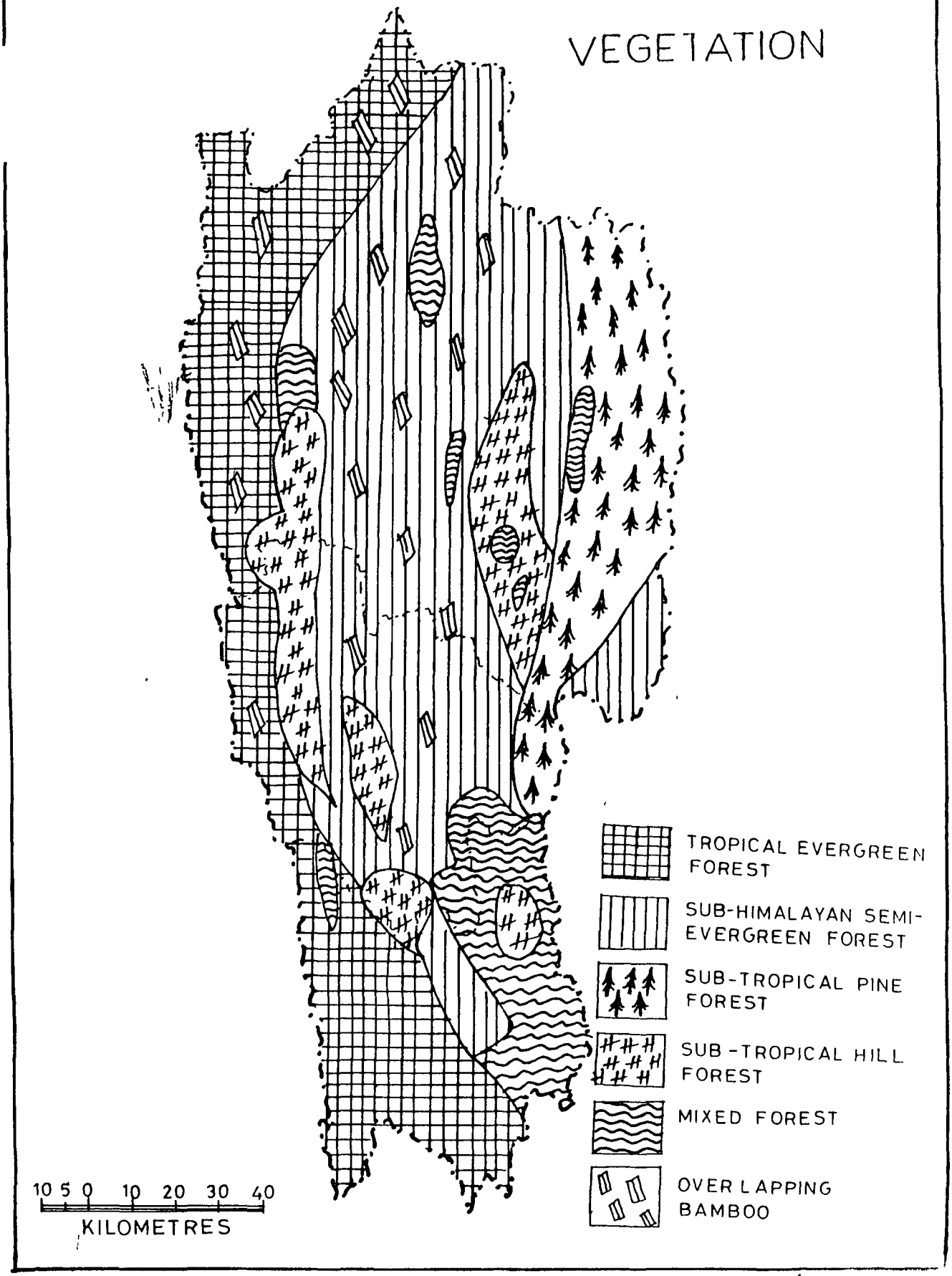
VEGETATION
TROPICAL EVERGREEN FOREST
SUB-HIMALAYAN SEMI-EVERGREEN FOREST
SUB-TROPICAL PINE FOREST
SUB-TROPICAL HILL FOREST
MIXED FOREST
OVER LAPPING BAMBOO
10 5 0 10 20 30 40
KILOMETRES

Fig.8.

These forests types and their distribution is yet to be surveyed properly. However, from the physical appearance of the vegetation, their distribution can be described as follows:-

1) Tropical Evergreen Forests: Forests of this type are found in the western part of Mizoram where rainfall is heavy. It extended from southern most along the western boundaries with Bangladesh till it reaches the Cachar district of Assam. About 20 percent of the total area is covered by this type of forest. The area covers the western half of the Chhimtuipui district, Lungsen and Bunghmun areas in Lunglei district, Pukzing, Hachhek mountenous areas and upto Vairengte in Aizawl district.

2) Sub-Himalayan Semi-Evergreen Forests: This is the major forest type in Mizoram occupying about 50 percent of the total geographical area. It covers the central area starting from Chhimtuipui river in the south upto Mauchar village in the north and east, Phaileng village in the west. In the eastern part of Aizawl district it is found between the Hill forests and Tropical Pine Forests around Kawlkulh and Khawzawl and also in the areas of Farkawn and Vaphai Villages.

3) Sub-Tropical Pine Forests: Sub-Tropical Pine Forests are found in the eastern side along the Burma border. They are found on higher elevation mainly in the areas of Champhai,

Ngur, Kelkang, Chhakpui, Tuichang, Kawlbem, Khuangleng, Leithum, Sakawrhmuituai, N.Vanlaiphai etc. in Aizawl district. It is also found in Thingsai area bordering Burma in Lunglei district.

4) Sub-Tropical Hill Forest: This type of Forests are found in the eastern as well as in the western part of Mizoram. They covered a small strip of hills running north to south direction. In Aizawl district this type of forest is seen in the areas of Saichal in the north extending upto N. Vanlaiphai. It is also found in the western part of the land along the areas of Lallen, Zopui, Pukzing, W.Bunghmun and Lungsen. It is also found isolated in Sangau area in Chhimtuipui district.

5) Over-lapping Bamboo: Bamboo is the dominant species of vegetation in Mizoram. It is found almost in all areas excepting few well elevated eastern region in the areas of Champhai, Khawzawl, Ngur, Kelkang, Khuangleng, Leithum etc. It is distributed all along the lower ridges and slopes as well as the riverine valleys and plains. The important bamboo species are Melocanna, Dendrocalamus, Hookeri, Bambusa Longispiculate, Sendrocalamus Helmiltonii, Psendostachyun, Ploymorphum etc. It is estimated that the bamboo covers more than 80 percent of the total vegetated area in Mizoram.

The following table shows the classification of Forests in Mizoram:

TABLE NO.2.5

CLASSIFICATION OF FORESTS IN MIZORAM

Management	Category	Area in Sq.Km.
State Owned	1.Protected Forests	1,300
	2.Reserved Forests	5,255.22
	3.Wildlife Sanctuary	572
Village Council Owned/Control	1.Village safety & Supply Reserved Forests.	1,782
	2.Unclassed Forests.	5,240
District Council Owned/Control.	1. Protected Forests.	347
	2. Reserved Forests	363
	3. Wildlife Sanctuary	210
	4. Village safety and supply Reserved Forests	866
	Grand Total	15,935.22 Sq.Km.

Source: Statistical Handbook, Mizoram, 1985 p.128-129.

PLATE NO. 1 : Development of gullies and nature of slope.

PLATE NO. 2 : Location of settlement along the river Khawchhaktuipui which drains the eastern part of Mizoram.

PLATE NO. 3 : Bamboo forests along the river valleys.

PLATE NO. 4 : Champhai is the largest plain area in Mizoram.

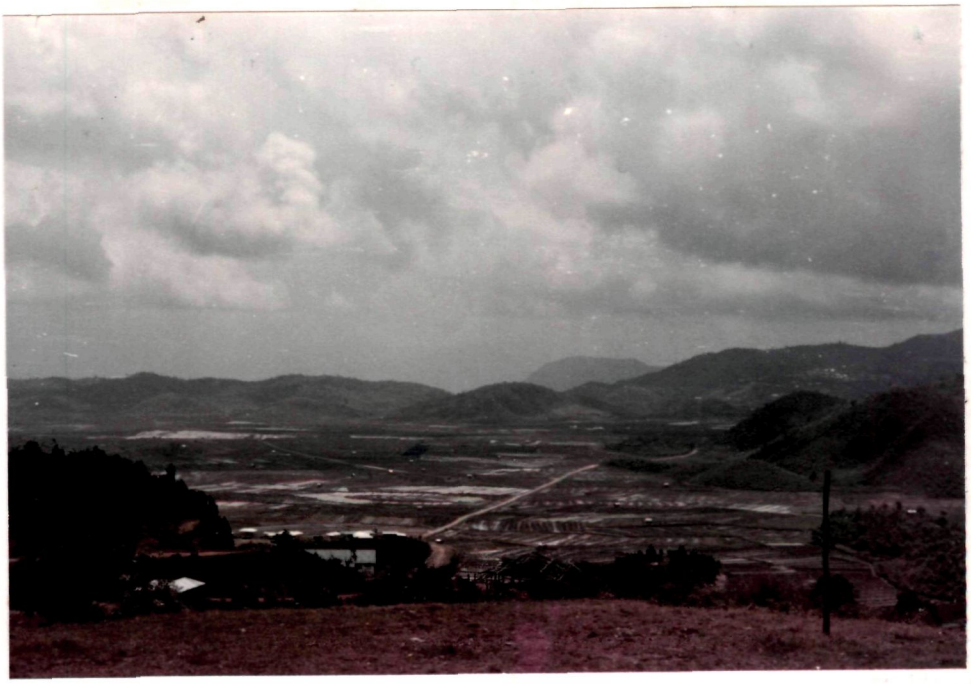

PLATE NO. 5 : An accidental burn of vegetation during dry season is common in Mizoram.

PLATE NO. 6 : Champhai Community Hall, destroyed by cyclone on 11 April, 1987.

PLATE NO. 7
A typical soil profile in Mizoram. Note that top soil cover is very thin.

PLATE NO. 8 : Major landslide on a loose sedimentary formation at Bethlehem Veng.

PLATE NO. 9 : Pine Plantation at Sakawrhmuituai hills.

CHAPTER III

DEMOGRAPHIC AND SOCIAL STRUCTURE

The study of the demography and social structure of a region has got a great significance in formalation of any plan for economic development of the region. The present study is an attempt to analyse the geographical influence upon various attributes of demographic and social structure such as migration, population growth and distribution, sex-ratio, literacy, religion and linguistic structures etc.

Historical background on settlement in Mizoram: It is a difficult task to trace the origin and evolution of settlements in Mizoram, because there is no integrated historical records of the region and as it was occupied by ignorant tribals who have lived for a long time in physical isolation and have no script of their own. As such oral testimony, traditional songs and folklores form the main basis of data of the Mizo history.

Traditionally, Mizo claim decent from Chhinlung,[1] a

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1. Some writers believe that Chhinlung might have been the name of a cave from which the forefathers of the Mizo tribes came out. Their argument is that the world,"Chhin" means 'cover', and 'Lung' - 'stone', and therefore "Chhinlung" denotes 'Covering Stone'. This theory is quite common among the other tribes such as Gangte, Paite,Thado, Vaiphei etc. On the other hand, some writers like H. Vanlawma contends that "Chhinlung" stands for the name of Chinese ruler Chien Lung during whose reign that the Mizos moved out to the present habitat. Again, B.K.Roy Burman in his book,"Socio-Economic Profiles of the Hill Areas of North East India (1961,p.84) opines it to be the present Silung in China bordering Shan State in the east.

mythical rock,east of the Shan State in Burma bordering China. Migration by tribal groups seems to have taken place as early as the beginning of the 15th Century. This migration of different grounds was retarded by several haltages at certain locations for longer and lesser periods through Shan State, Chindwin valley and Chin Hills in Burma.

The first large scale migration of the Mizos started from the Chin Hills by crossing over the hill ranges bordering south west of Manipur. The Mizo tribes entered the present Mizoram in successive bands and the Hmars, a Mizo sub-tribe, were the first to enter.[2] As to the date of their migration from Chin Hills to Mizoram, C.A. Soppit(1976)[3] believes that the first batch of the Mizo tribes after crossing Tiau river settled in Mizoram sometime in the middle of the 16th Century. Liangkhaia (1938)[4] also supports this view and agrees that a section of the Hmars entered the Manipur plain about the middle of the 16th Century and the beginning of the 17th Century A.D.

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2. Liangkhaia: Mizo Chanchin, Aizawl, 1938. pp.7-8.

3. Soppit, C.A: A Short Account of the Kuki-Lushai Tribes, Aizawl (Reprint),1976 p;vii.

4. Liangkhaia,op.cit.pp.31

The Mizos entered Mizoram in four successive batches. The first batch included the sub-clans of Hmar such as Hrangkhawl, Pang, Mualthuam and Chunthang under their chief Chawnhmang who eventually migrated to Tripura. They were followed by the Hrangchal, Ngurte, Darngawn, Lungtau, Leiri and Changsan.[5]

Since each clan followed a particular route and built their own villages, the villages became to be known by the clan's name. To this day, many of these villages are in existence under such name like Biate, Chhungte, Darngawn, Khawbung, Khawzawl, Ngur, Thiak, Vankal, Zote and so forth.[6]

The Mizos after entering the present Mizoram, found the land to be very healthy and embracing climate and thought that it was the land which nature has provided for them. But later, dispersion and micro-regional migration took place as a result of constant war against one another. The inter-village and interclan wars were the order of the day as a result of their claim for territorial possession. Want of fertile cultivable lands for jhuming was always the bone of contention among them.

In short, as a result of the wars among the clans and villages, certain clans of the Mizo origin have later

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5. Songate, Hranglien; Hmar chanchin (Hmar History) Churachandpur, Manipur (Reprint) 1977. p. 145-146.

6. Liangkhaia, op.cit., p.8.

migrated to different parts of N.E. India. The sub-clans of Hmars fled north and west to Manipur, Cachar, Sylhet and Tripura. A section of Biate entered Cachar district between 1730 and 1780 and some of them want upto North Cachar Hills and Meghalaya.[7]

POPULATION GROWTH:

The population of Mizoram according to 1901 Census was 82,434 persons. By 1981, it has been multiplied to 4,93,575 persons which is nearly six times larger than that of 1901 Census. The decadal variations of population growth in Mizoram during the nine Census periods i.e., from 1901 to 1981 is not symmetrical. (See table No.3.1). The population rose to 91,204 from 1901 to 1911 showing an increase by 10.64 percent. It further rose to 98,406 in 1921, but the decadal increase rate has declined to 7.90 percent. The main reason behind this declining trend is that Mizoram undergone a natural famine called Mautam in 1912 which retarded the progr ss of population growth. The Census of

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7. Songate, op cit. p. 62-63, Also see Liangkhaia op. cit. p. 48.
8. Mautam is a natural famine which appears in Mizoram at an interval of about 50 years. The famine is caused by the flowering and the dying down of bamboo species which led to an abnormal increase in the population of jungle rats, insects and pesticides., The pesticides ate away the crops and famine follows. The starvation resulted not only in reduction of fertility of the people, but directly or indirectly accelerated the mortality rate.

TABLE NO.3.1

INCREASE AND DECADAL VARIATION IN POPULATION IN MIZORAM SINCE 1901

U.T/Districts	Year	Persons	Decade variation	Percentage decade variation.	Male	Females
MIZORAM	1901	82,434	-	-	39,004	43,430
	1911	91204	+8,770	+ 10.64	43,028	48,176
	1921	98,406	+7,202	+ 7.90	46.462	51.754
	1931	1,24,404	+25,998	+ 26.42	59.186	65,218
	1941	1,52,786	+28,382	+ 22.81	73,885	78,931
	1951	1,96,202	+43,416	+ 28.42	96,136	100,066
	1961	2,66,063	+69,861	+ 35.61	132,465	133,598
	1971	3,32,390	+66327	+ 24.93	170,824	161,566
	1981	4,93,757	+1,61,367	+ 48.55	257.239	236,518
AIZAWL	1971	2,29,112	-	-	116,401	112,711
	1981	3,40,826	+1,11,714	+ 48.76	176.242	164,584
LUNGLEI	1971	62,136	-	-	33,736	28,400
	1981	86,511	+ 24,375	+ 39.23	45,998	40,513
CHHIMTUIPUI	1971	41,142	-	-	20,687	20,455
	1981	66,420	+ 25,278	+ 61.44	34.499	31,421

Source: Census of India,1981,Series No.31,Mizoram Directorate of Census Operations, Mizoram p.26.

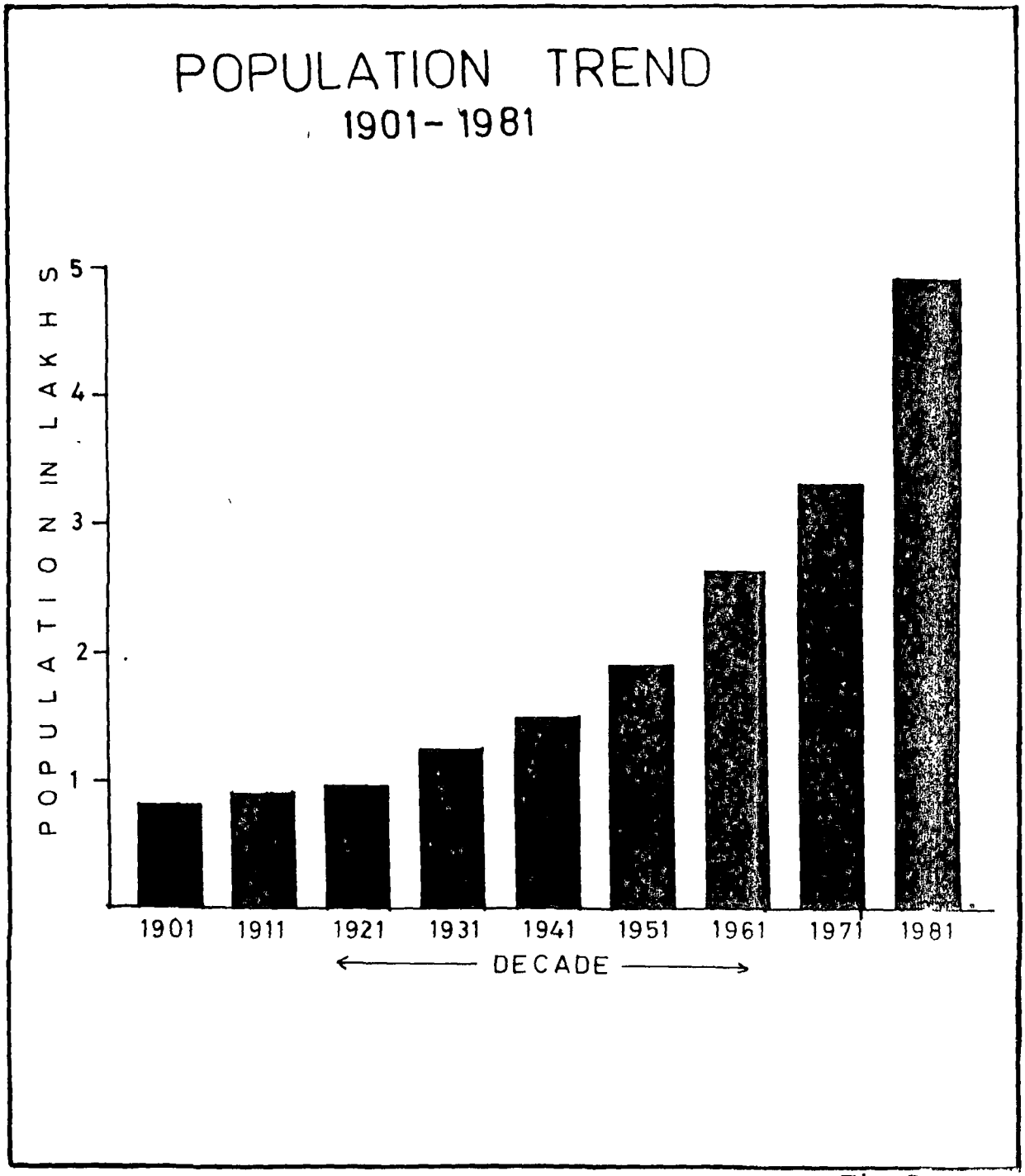
POPULATION TREND
1901- 1981
POPULATION IN LAKHS
5
4
3
2
1
1901
1911
1921
1931
1941
1951
1961
1971
1981
DECADE

Fig.9

1931 depicts a very high rate of increase in population i.e., 26.42 percent from the previous census figure. The revovery from famine with increase in agricultural products can be attributed to this rapid increase. Again, the decadal increase in population falls to 22.81 percent in 1941. It can be seen in the following two decades i.e., 1951 and 1961 that the growth rate is steadily increasing with 28.42 percent and 35.61 percent respectively. The 1971 census figure shows another low rate of decadal variations i.e., 24.93 as compared to the previous decades. By this time the population has come up to 3,32,390 persons with the addition of 66,327 persons to 1961 Census figure. By 1981, the population figure of Mizoram stood at 4,93,757 persons, of which 52 percent are males and 48 percent are females. The percentage increase from 1971 to 1981 was 48.55 which is almost double of the percentage increase during 1961 to 1971. The declining rate of growth in 1961 to 1971 is due to the political disturbance which broke out in 1966. The Mizo National Front(MNF) with an attempt to secure an independent sovereignty started to fight against the Indian army which tolled many lives. Another reason is that many youths and youngsters who joined MNF and went underground were not enumerated in the Census operations at that time.

Table No.3.1 reveals that the population growth has a high rate during the nine Census periods. The lowest rate is 7.90 percent in 1921, due to natural calamity (Mautam) occured in 1912. The highest growth rate is to be seen in the latest Census operation in 1981 with the growth rate of 48.55 percent. Steady development in economy, health and medical awareness, education infra-structures and the conversion of Mizoram into Union Territory providing job opportunities etc. are the main reasons that accelerated the population growth during this decade. The influx of Chakma refuges from Bangladesh and the century of skilled-labour from Cachar district of Assam have also helped in this trend.

The population trend cannot be analysed by district-wise due to absence of data[9]. However, in 1981 the Chhimtuipui district has a highest growth rate which is 61.44 percent, the reason being Chakma immigrants who entered the district from Bangladesh. Aizawl district has a growth rate of 48.46 percent which is also quite high. Lunglei district has a growth rate of 39.23 percent.

POPULATION DISTRIBUTION:

The present study is focussed on the distribution of population in the region, in which the possible geographical

9. Mizoram was under the State of Assam during 1971 and was then known as Mizo District. Hence the persent district figure for 1971 and prior to it are not available separately. The Mizoram Union Territory was formed after 1971 Census.

TABLE No.3.2

Block-wise Population,1931

Block	Population	Area Sq;Km	Density per Sq.Km
1. Tlangnuam	93796	600	156,28
2. Khawzawl	3580	1394	25,68
3. Thingdawl	35351	1526	23,16
4. Lunglei	34530	1580	21.85
5. E.Lungdar	28885	1450	19.92
6. Lokicherra	24444	1125	21.72
7. Serchhip	23428	700	33.46
8. Tuipang	22143	674	32.85
9. Lungsen	21127	1442	14.65
10.Thingsul-thliah	20638	898	22.98
11.Ngopa	20956	1505	13.92
12.Hnahthial	18615	1298	14.34
13.Lawngtlai	18517	911	20.32
14.Darlawn	18066	712	25.37
15.Chawngte	16983	354	47.97
16.W.Phaileng	1638	1254	13.42
17.W.Bunghmun	12239	1648	7.26
18.Aibawk	11671	582	20.05
19.Leiek	10973	844	13.00
20.Sangau	8777	354	16.43

Source: Directorate of Census operations, Govt.of Mizoram, Aizawl.

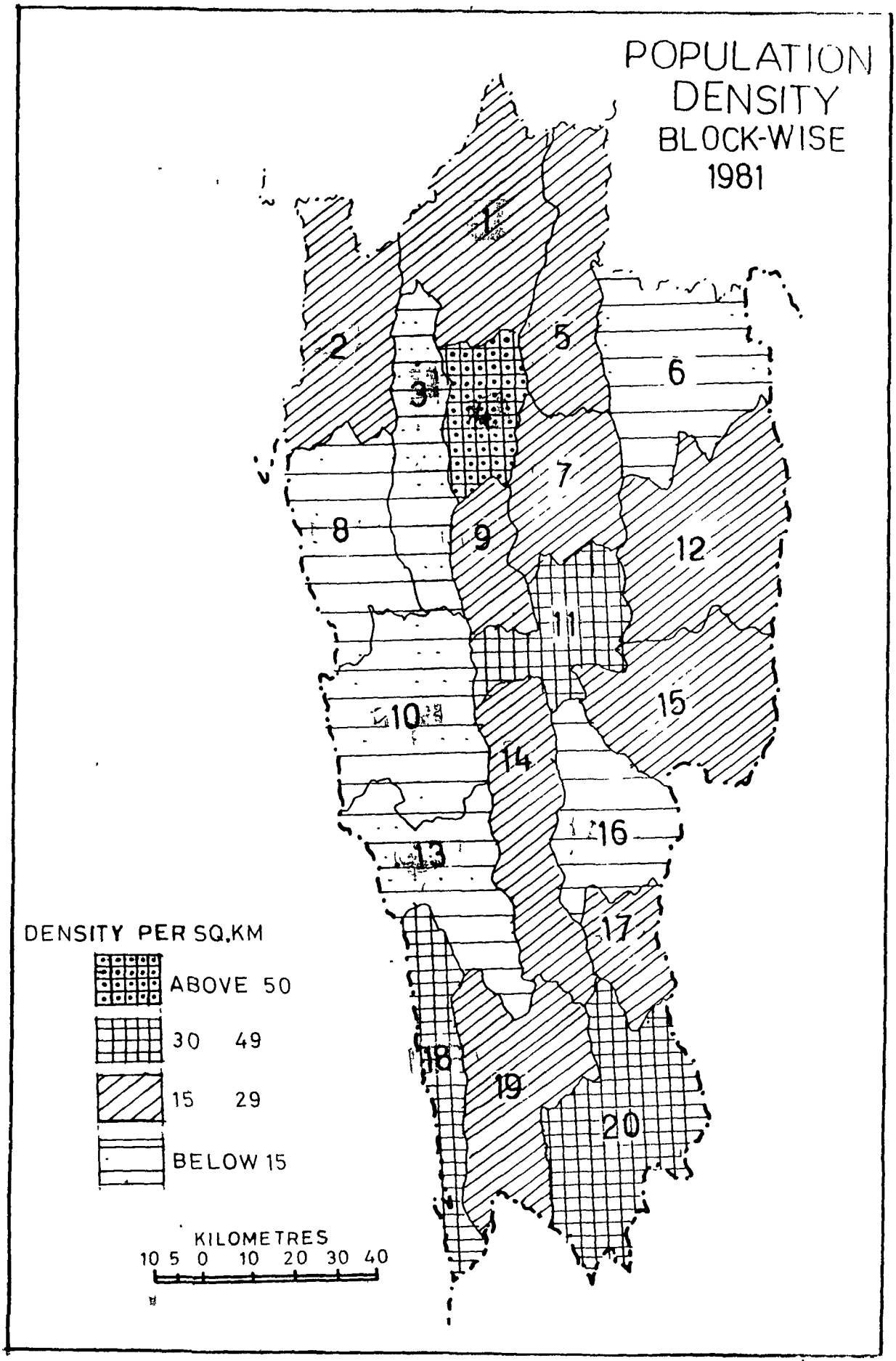
POPULATION
DENSITY
BLOCK-WISE
1981
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
DENSITY PER SQ.KM
ABOVE 50
30 49
15 29
BELOW 15
KILOMETRES
10 5 0 10 20 30 40

Fig.10.

INDEX TO FIGURE NO 10

CODE NO	NAME OF C.D.BLOCK
1.	Thingdawl
2.	Lokicherra
3.	Reiek
4.	Tlangnuam
5.	Darlawn
6.	Ngopa
7.	Thingsulthliah
8.	W.Phaileng
9.	Aibawk
10.	W.Bunghmun
11.	Serchhip
12.	Khawzawl
13.	Lungsen
14.	Lunglei
15.	E.Lungdar
16.	Hnahthial
17.	Sangau
18.	Chawngte
19.	Lawngtlai
20.	Tuipang

factors that involved in spatial distribution will be analysed. Mizoram with density of 23 persons per sq.km ranks one of the lowest state in India.[10] The population distribution(Blockwise density) is shown (Fig. No.10.).

It can be seen from the map that the total twenty blocks in Mizoram have different population density ranges. The highest range is found in Tlangnuam block with density of 156 persons per square Kilometre, due to urban agglomeration of Aizawl, the capital headquarter of the State. Density is moderate in the Blocks of Chawngte(48/sq.Km) Serchhip (33/Sq.Km), and Tuipang(33/Sq.Km) Chawngte Block , though characterised by hot and humid climate, gives shelter for Chakma refugees from the border Bangladesh owing to isolation and inaccessibility from the other parts of the State. The moderate density in Serchhip Block is the result of town agglomeration in Serchhip town, which is well connected with Transport routes and bounded by favourable environments. Tuipang block is one among the moderate density ranges, again due to urban population of Saiha town the district headquarter.

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10. The density of population in India at 1981 Census (excluding area and population figures of J&K State) was 211 persons per Sq.Km.

Population density is low(or moderately high if we think in terms of average density of Mizoram as a whole) in the Blocks of Khawzawl(26 per sq.Km), Darlawn(25 per sq. Km) Thingdawl(23 per sq.Km), Thingsulthliah (23 per sq.Km) Lunglei(22 per sq.km),Lokicheera(22 per sq.Km), Lawngtlai (20 per sq.Km), Aibawk(20 per sq.Km), L.Lungdar(20 per sq. Km), and Sangau(16 per sq.Km). All these Blocks are favourable for human settlements as far as topography and climatic conditions are concerned. They are all connected either by all weathered roads or truckable roads.

Lowest density i.e., below 15 per sq.Km is found in remote areas like W.Bunghmun, Reick, W.Phaileng, Ngopa, Hnahthial and Lungsen. These areas are characterised by one or more of the adverse geographic conditions like steep slopes, dissected hills, warm and unhealthy climatic conditions and inaccessible thick forests. W. Bunghmun Block has a lowest density figure of 7 persons per sq.Km, followed by Reiek Block with a density of 13 persons per Sq.Km. These two Blocks are comprised of difficult mountenous terrain with deep river valleys, lagging behind the transport and communication lines.

The district level study of density reveals that the density tends to decrease southward. Aizawl district has a density of 27 persons, Lunglei district - 19 and

Chhimtuipui has 17 persons per Square Kilometre. Southward increase in temperature and humidity has been responsible for their decreasing trend at the most, and inaccessibility to the main stream to some extent.

RURAL AND URBAN POPULATION:

Rural population relates to the population enumerated in areas other than those treated as urban according to the Census definition.[11] According to 1981 Census, 75 percent of population of Mizoram live in the rural parts and only 25 percent live in the urban areas. This indicates that Mizoram's population is predominantly rural.

Absence of economic activities other than jhum cultivation restricted the population of Mizoram to confine in rural areas. The limited cultivable lands do not favour the urban growth as the cultivator benefits more if he settles as near as to the field so that he can attend his

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11. Prior to 1971 Census, there was only one town in the whole of Mizoram namely, Aizawl town which was the Class IV Category. In the 1971 Census Lunglei was declared as Class IV Town. In the 1981 Census, the following places, namely, Champhai, Kolasib and Serchhip within the Aizawl district and Saiha within the Chhimtuipui district were declared as Census towns. All these new towns were of Class V Category i.e., population of 5000 to 9,999. Thus in the 1981 Census, there were as many as six towns in the whole Mizoram.

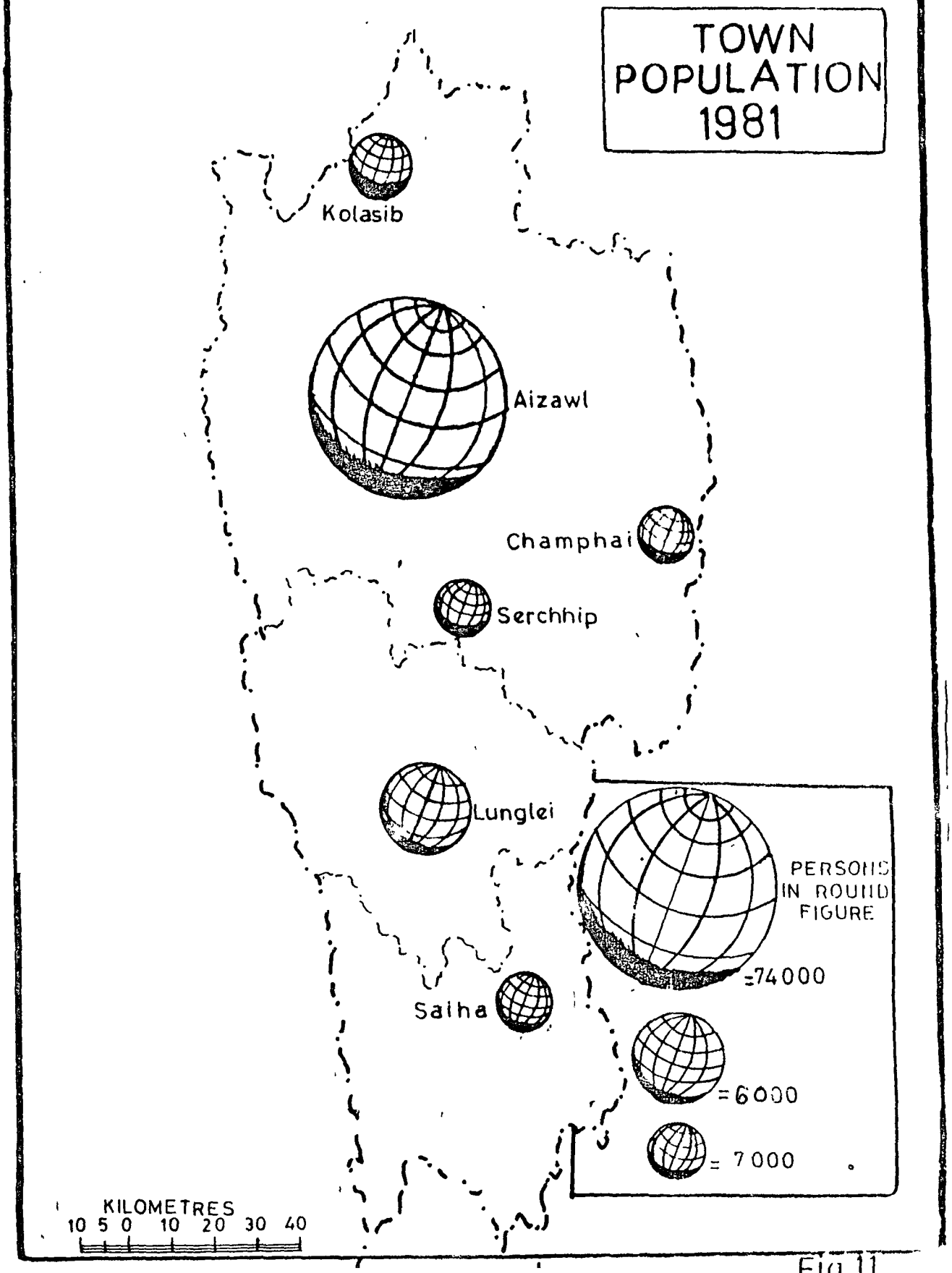
TOWN
POPULATION
1981
Kolasib
Aizawl
Champhai
Serchhip
Lunglei
Saiha
PERSONS
IN ROUND
FIGURE
=74000
=6000
= 7000
KILOMETRES
10 5 0 10 20 30 40

Fig.11.

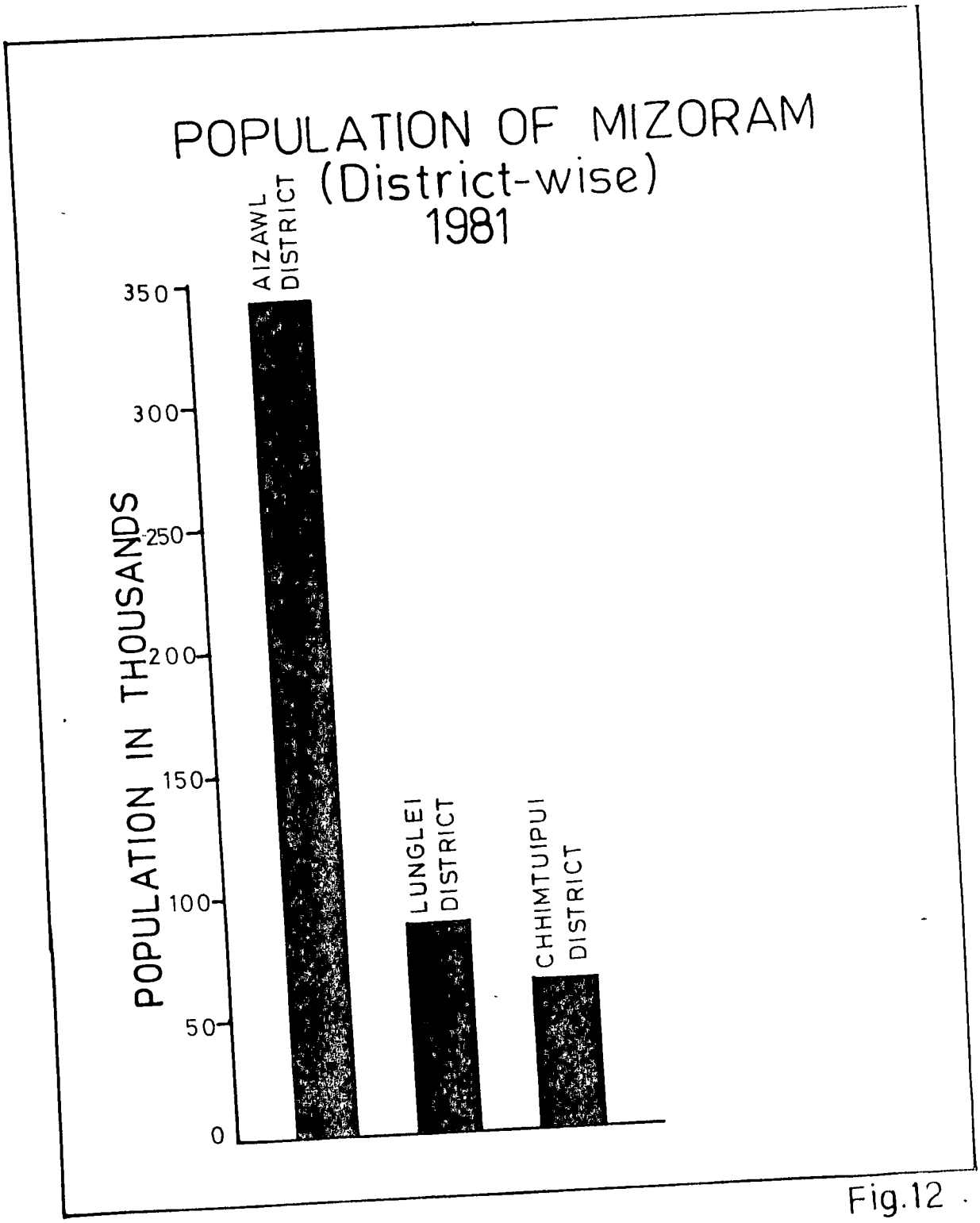
POPULATION OF MIZORAM
(District-wise)
1981
POPULATION IN THOUSANDS
350
300
250
200
150
100
50
0
AIZAWL DISTRICT
LUNGLEI DISTRICT
CHHIMTUIPUI DISTRICT

Fig.12

jhum most of the time. The corresponding figures of 88.64 percent for rural and 11.36 percent for urban in the 1971 census reveals that Mizoram has made considerable progress in the process of urbanisation.

In 1971, there were only two towns in Mizoram whereas there were six in 1981 Census. The towns were classified into six Categories.

Population	Class
1,00,000 and above	I
50,000 - 99,999	II
20,000 - 49,999	III
10,000 - 19,999	IV
5,000 - 9,999	V
Below - 5500	VI

According to this classification, there is no town under Class I III and VI in Mizoram. There is one Class II town namely Aizawl, one Class IV town i.e,, Lunglei and four Class V towns such as Champhai, Kolasib, Serchhip and Saiha. The urban population is represented in Figure. No.11

The composition of Rural and Urban population of Mizoram is shown in the table No;3.3.

TABLE No.3.3

RURAL AND URBAN COMPOSITION OF POPULATION

State/ District	Population of 1981 (Privisional)			Percentage of Urban to total population		Decennial Growth Rate 1971-81		
	Total	Rural	Urban	1971	1981	Total	Rural	Urban
Mizoram	4,87,774	3,65,009	1,22,765	11.36	25.17	46.75	23.89	225.1
Aizawl District	3,40,766	2,42,793	97,973	13.85	28.75	48.73	23.01	208.7
Lunglei District	82,589	64,816	17,773	9.83	29.52	32.91	15.50	195.2
Chhimtuipui District	64,419	57,400	7,019	N.A.	10.90	56.57	39.52	N.A.

(N.A.denotes "Not available)

Source: Statistical Handbook, Mizoram 1981,p.96.

SEX RATIO:

Sex-ratio indicates the number of females per thousand males in the population. The changes in sex-ratio of Mizoram is shown in the table 3.4.

It can be seen from the above table that the sex-ratio of Mizoram has registered a substantial decrease since 1921. The immigrant population from the Cachar plains, who are normally males, has, possibly brought down the ratio till date. It is also presumed that during the 1971 Census. Mizoram being declarared politically distrubed area, most of the male members had joined the underground movement leaving females behind and thus they are not enumerated during the Census count. Such being the case, the number of females is rather on the high side. But in course of time, several of the underground members came out from their hideouts and were enumerated in 1981 Census. This caused the decrease in female population. The sex-ratio has decreased from 946 in 1971 to 919 in 1981

LITERACY:

The percentage of literacy[12] of Mizoram in 1981 was

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12. A person who can both read and write with understanding in any language is to be taken as literate. A person who can merely read but cannot write is not literate. It is not necessary that a person who is literate should have received any formal education or should have passed any education stardard.

TABLE No.3.4

CHANGES IN SEX-RATIO 1901-1981

State/ District	Total Rural Urban	1001	1911	1921	1931	1941	1951	1961	1971	1981
Aizawl	T	1,113	1,120	1,109	1,102	1,069	1,041	1,009	946	919
	R	1,113	1,120	1,109	1,102	1,068	1,049	1,017	947	928
	U	-	-	-	-	-	845	869	936	893
Lunglei	T	-	-	-	-	-	-	-	968	934
	R	-	-	-	-	-	-	-	971	945
	U	-	-	-	-	-	-	-	954	907
Chhimtuipui	T	-	-	-	-	-	-	-	989	898
	R	-	-	-	-	-	-	-	989	905
	U	-	-	-	-	-	-	-	-	836

Source: Census of India, Series No.31, Mizoram p.26

TABLE NO.3.5

LITERACY AND SPATIAL PATTERN DISTRICT-WISE, 1981

(Literacy in Percentage)

State/ District	Total/ Rural/ Urbal	Total	Male	Female	Variation in Male & Female.
Mizoram	Total	59.88	64.46	54.91	9.55
	Rural	55.24	56.49	43.50	12.99
	Urban	74.06	55.12	44.87	10.25
Aizawl District	Total	62.15	54.74	45.25	9.49
	Rural	61.15	54.89	45.10	9.79
	Urban	74.89	54.43	45.56	8.87
Lunglei District	Total	56.88	58.46	41.53	16.93
	Rural	52.61	58.89	41.10	17.79
	Urban	74.10	57.21	42.78	14.43
Chhimtuipui District	Total	37.06	63.33	36.66	26.67
	Rural	34.07	63.93	36.07	27.86
	Urban	62.36	60.58	39.41	21.17

Source: Primary Census Abstract, Series-31,Mizoram,Census of India 1981,p.31 & 35

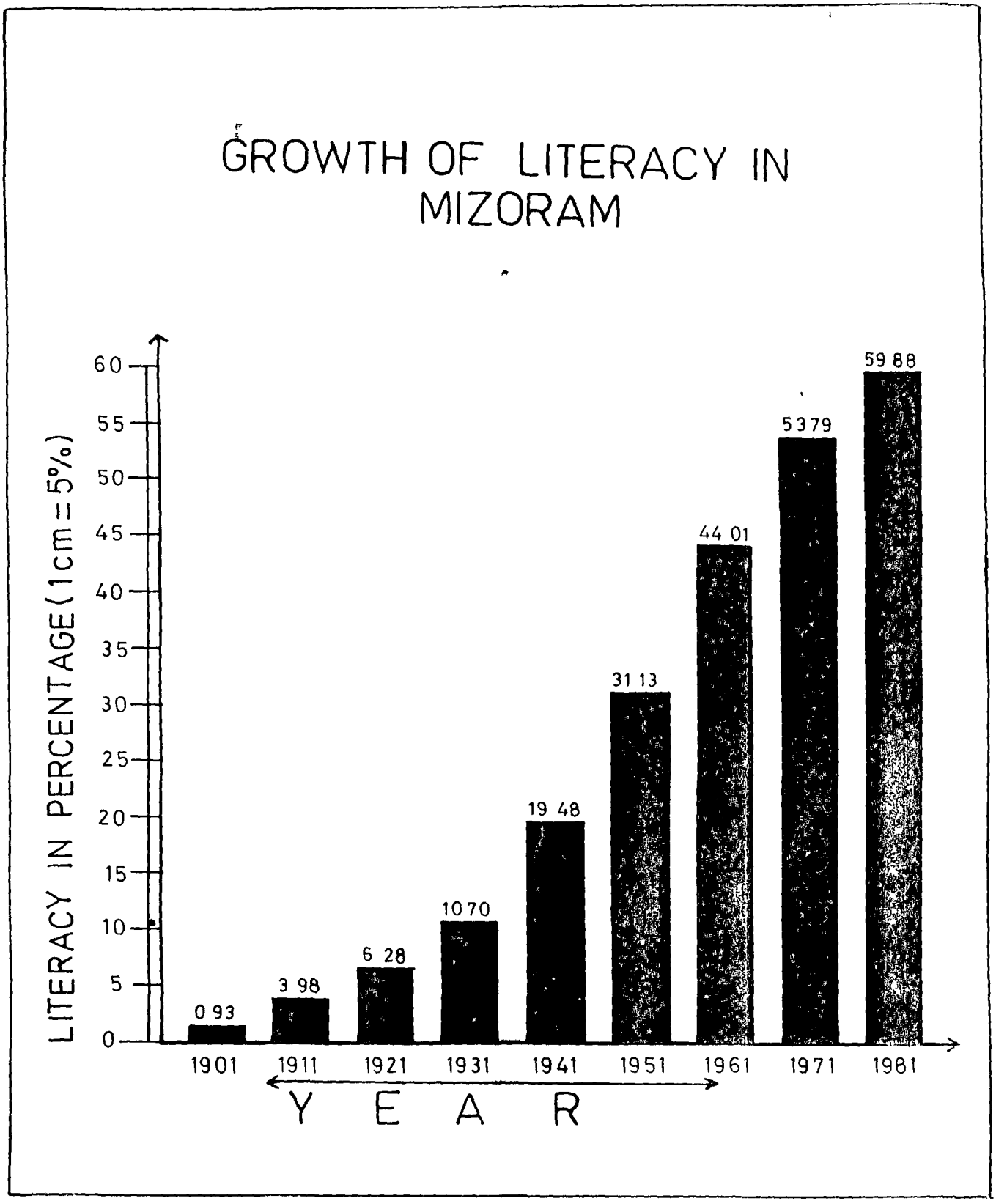
GROWTH OF LITERACY IN MIZORAM
LITERACY IN PERCENTAGE (1cm = 5%)
60
55
50
45
40
35
30
25
20
15
10
5
0
0 93
3 98
6 28
10 70
19 48
31 13
44 01
53 79
59 88
1901
1911
1921
1931
1941
1951
1961
1971
1981
YEAR

Fig 13

59.88 as against all India average of 36.17 percent. This indicates that Mizoram stood one of the highest States in India surpassed only by Kerala (69.17 percent) and the Union Territories of Chandigarh (64.69 percent) and Delhi (61.06 percent).

The progress of Literacy in Mizoram is shown in Fig.13. As it can be observed from the figure, the literacy growth rate undertook a rapid process. It was as low as 0.93 percent in 1901 Census but increased to 59.88 percent in 1981. The break up of male and female literacy in respect to rural and urban is shown in Table 3.5

The table (3.5) clearly disclosed that the literacy percentage in both sexes is higher in the urban areas than the rural areas. The urban literacy accounts for 74 percent while rural areas have only 55 percent. The availability of better facilities for education and employment in urban areas account for the high percentage in literacy rate. In Aizawl and Lunglei districts, the urban literacy account for more than 70 percent excepting Chhimtuipui district which has 62.36 percent. The reason is obvious, due to the urban agglomerations. The variations in rural and urban literacy coincides with the variation in urban literacy in the three districts. In Aizawl district the difference in rural and urban literacy is 13.74 percent; 21.45 percent in Lunglei district and Chhimtuipui district has a difference of 28.25 percent.

Another distinct characteristic is that the literacy for male is higher than female in all the districts. The variation ranges from 9 to 27 percent, aggravated towards the south. The difference in male and female literacy in Aizawl district is 9.49 percent, Lunglei district 16.93 percent and Chhimtuipui has a highest of 26.67 percent.

POPULATION BY RELIGION:

Religion is an important and perhaps, the basic cultural characteristic of the population. The Mizo were animists in the past, but this animism should not be treated as their religion because they believed the existence of Creator or God.

Christianity was brought into this land in 1894 by the English Missionaries .It spread rapidly that within half a century, it became the dominant religion in the State. The other religions are Buddhism,Hinduism, Islam, Sikkhism and Jainism. The composition of these religions in Mizoram is shown in table 3.6.

The table (No.3.6) clearly shows that Christianity is the dominant religion in Mizoram accounting for 83.81 percent. The second religion i.e., Buddhism accounts for 8.19 percent only. Hinduism accounts for 7.14 percent, Islam, Sikhism and Jainism are negligible, accounting for less than 1 percent.

TABLE NO. 3.6

POPULATION COMPOSITION BY RELIGION, MIZORAM 1981

Religious Community.	Persons	Males	Females	Sex Ration	Percentage of total Population	Decadal growth rate 1971-81(%)
Christian	413,840	207,485	206,355	995	83.81	44.63
Buddhists	40,429	21,073	19,356	919	8.19	78.52
Hindus	35,245	25,660	9,585	374	7.14	66.02
Muslims	2,205	1,812	393	217	0.45	17.16
Sikhs	421	376	45	120	0.09	1.41
Jains	11	7	4	571	Negligible	266.67

Source. Census of India, 1981. Series - 31 Mizoram. Paper I of 1985 p.v.

The spatial pattern of distribution of the population of these major religious communities in rural and urban area is shown in the table No.3.7

TABLE NO .3.7

Religious Communities	Rural population	Percentage to rural population	Urban population	percentage to Urban population
Christians	304,409	81.84	109,431	89.83
Buddhists	40,366	10.84	93	0.08
Hindus	24,423	6.57	10,822	8.88
Muslims	1,064	0.29	1,141	0.94
Sikhs	238	0.06	183	0.15
Jains	..	..	11	0.01

Source: Census of India 1981, Series - 31 Mizoram, Paper I of 1985 p.vi.

A better percentage of the major religions in Mizoram are concentrated in urban areas, excepting the case of Buddhists. In this case, the population persuading Buddhism is higher in rural areas. The reason is that Buddhism is the religion of the Chakmas who lived in the rural areas of the south western part of Mizoram.

There is also a variation in decrease or increase of the population of religions communities in Mizoram during the last decade. The percentage share of Christianity has come down to 83.81 in 1981 from 86.08 percent in 1971. Buddhism, on the contrary, has increased to 8.19 percent in 1981 from 6.81 percent in 1971. The recent immigrations of the Chakma refugees and ffom the neighbouring states can be accounted for the decadal variations.

LANGUAGE:

Mizoram represents, perhaps, the most significant deviations as far as linguistic diversity in India is concerned. It is a monolingual State in which Mizo is the lingua-franca of the State. The Mizo language belongs to the Assam-Burma Branch of Tibeto-Burmese family of languages.

There are only five languages with more than one percent speakers. These languages are[13]:

1. Mizo/Lusei	79.22 Perdent
2. Chakma	6.57 Percent
3. Bakher	3.58 Percent
4. Pawi	2.58 Percent
5. Hmar	1.09 Percent

13. Ahmad Ali., Linguistic Pattern of North-Eastern Region. Abstract from First National Symposium on Language & Social & Regional Identities in India. J.N.U., New Delhi. 1982 , p.37.

These five languages account for 93.04 percent of the total population of this State. The remaining percentage is shared by Kiang, Hindi, Nepali and Bengali. The speakers of Mizo or Lusei language are about 80 percent. Instead of high tribal concentration in the region linguistic diversity is insignificant as compared to other tribal areas. The reason is that unlike the other tribal groups, who came in pre-historic or ancient period, occupied inacessible hilly areas and thereafter lived in nearly complete socio-cultural isolation, the Mizo came very recently - between 15th and 18th Centuries when the Mizos migrated from Burma, they have had a fairly developed spoken Mizo language. During the last few centuries, variation in Mizo language has not been significant.[14]

Chakma language is a deviation from Bengali and Lakher language is unintelligible to the Mizos. Pawi and Hmar languages have much similarities with Mizo language.

WORK PARTICIPATION RATE:

The work participation rate of the population of Mizoram according to 1981 Census is 45.44 percent. The rural population contributed about 80 percent of the workers due to the fact that Mizoram is a region where rural and agricultural population dominate.

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14. Ahmad, Ali., Op cit p.38.

In Aizawl district, the work participation rate is 45.42 percent Lunglei district has the lowest rate among the three distficts which is 44.06 percent. Chhimtuipui district has a rate of 47.28 percent which is the highest (See Table No.3.8).

A conspicuous character is that the working population is dominated by male workers. Male workers account for 63 percent of the total workers of Mizoram as a whole. Female workers share 39.76 percent only.

In Aizawl district, 59.11 percent of the workers are shared by male workers, the remaining 40.84 percent is shared by female workers. In Lunglei district it is 64.63 percent and 35.36 percent for male and female, whereas it is 60.37 percent and 39.62 percent in Chhimtuipui district for male and female respectively.

In 1961, the work participation rate for the total population was 47.23 percent and male and female work participation rate were 48.56 percent and 45.92 percent respectively. In 1971 Census, about 45.61 percent of the total population were reported as workers in Mizoram against the work participation rate of 33.34 percent for the country as a whole. The decrease in work participation rate from 1961 to 1971 may be due to the conceptual difference of workers in the two Censuses. The 1981 Census shows further decrease in work

participation rate. In otherwards, the number of non-workers of the dependency ratio tends to be higher as development progress.

TABLE NO. 3.8

PERCENTAGE* DISTRIBUTION OF WORKERS IN MIZORAM
1981
DISTRICT-WISE

State/District	Sex	Total Population	Total workers
Mizoram	Persons	100.00	45.44
	Males	52.10	27.37
	Females	47.30	18.07
Aizawl district	Persons	69.03	31.36
	Males	35.69	18.54
	Females	33.33	12.81
Lunglei district	Persons	17.52	7.72
	Males	9.32	4.99
	Females	8.20	2.75
Chhimtuipui district.	Persons	13.45	6.36
	Males	7.09	3.84
	Females	6.36	2.52

Source: Census of India 1981, Primary Census Abstract Part II B Series - 31, Mizoram.

* Percentage of each colum and each line is calculated from the total population of Mizoram which is 4,93,757.

TRIBAL COMPONENTS:

In Mizoram the percentag of tribal population is significantly high and tribal concentration is mostly even in all the districts. Of the total population, Scheduled Tribes accounts of 93.55 percent while Scheduled Caste accounts for 0.03 percent only.[15]

The tribal concentration is very even in the region as the percentage variation is less than 5 in all the districts. In Aizawl district tribal population shares 93.91 percent. It is 92.01 percent and 93.66 percent in Lunglei and Chhimtuipui districts respectively.

The Scheduled Caste population is insignificant in Mizoram. Its percentage to total population is as low as 0.03 percent. The percentage of Scheduled Caste population is highest in Chhimtuipui which is 0.05 percent, and comparatively lower in Aizawl and Lunglei district with 0.02 percent in both the districts.

The difference in male and female population in case of tribal is very small. The male tribals constitute 46.83 percent while female tribals account for 46.71. In Aizawl district, the percentage of male and female in case of Scheduled tribe is 49.90 percent and 50.09 percent

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15. The actual figures for Scheduled tribes and Scheduled Castes in Mizoram according to 1981 Census is 461,907 persons and 135 persons respectively.

respectively. In Lunglei district it is 50.22 percent and 49.74 percent, and 50.70 and 49.29 percent respectively in Chhimtuipui district.

The percentage variation in male and female population in case of Scheduled Caste is quite significant. Male population accounts for 88.89 percent and the female shares only 11.11 percent in Mizoram as a whole. The percentage of male in Aizawl district is 85.18 and 14.81 percent for female Scheduled Caste. It is 94.11 percent and 5.88 percent for male and female in Lunglei district and 94.59 percent and 5.40 percent in Chhimtuipui district respectively.

MIGRATION:

Migration is not very significant in the State of Mizoram as compared to the other States of India.[16] The immigrants from various States of India as well as from foreign countries numbered 24067 persons according to 1981 Census. This means that the migrants take a share of merely 4.87 percent to the total population of Mizoram.

Of the total migrants Assam contributed 6059 persons which is 25.17 percent of the total migramts. The migrants from Tripura took second position with 3665 persons which is 15.22 percent. Bihar, with 2388 persons (9.92 Percent) surpassed the migrants population of the adjoining States of

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16. Due to the enforcement of Inner Line Regulation Act, the migrants from outside Mizoram has been controlled.

Manipur and Meghalaya which have 1790 persons (7.43 percent) and 1786 persons (7.42 percent) respectively.

A considerable sections of people also migrated to Mizoram from Asian countries. Among them, Burma, Nepal and Bangladesh are the leaders. The share of Burma is 6.59 percent to the total migrants in Mizoram; Nepal 5.50 percent and Bangladesh with 5.00 percent.

Besides these, the States and Union Territories of India like Uttar Pradesh, Delhi, Kerala, West Bengal and Nagaland have contributed migrants to Mizoram with a percentage share more than one. The percentage value of migrants from Uttar Pradesh is 3.34, Delhi - 2.83; Kerala 2.07 and Nagaland 1.13 percent.

Due to lack of data, the migratory movements from Mizoram to outside cannot be analysed.

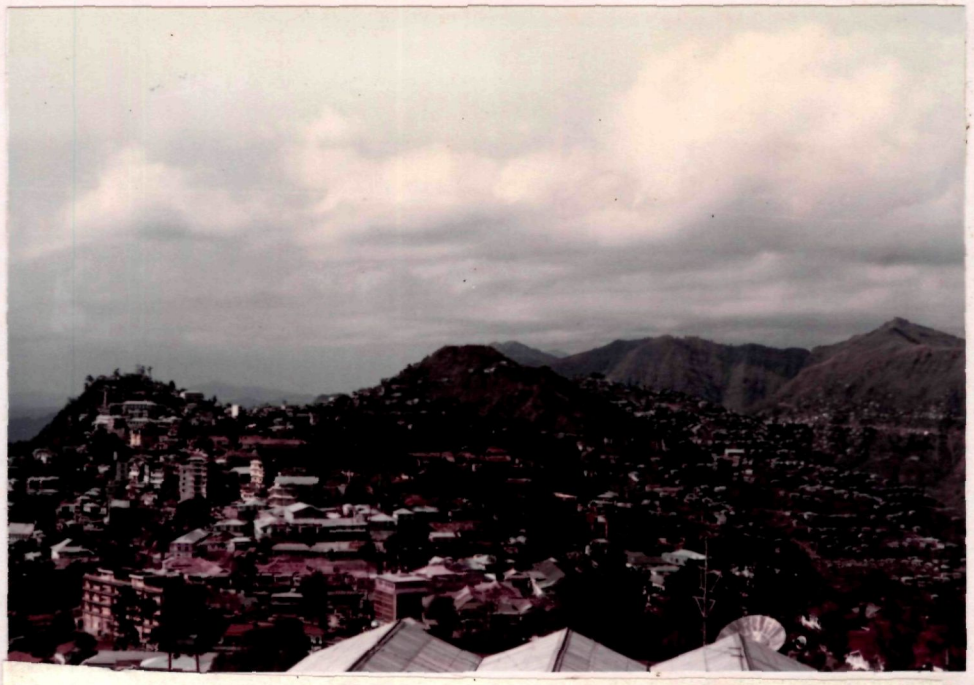

PLATE NO. 10 : A longitudinal view of Aizawl town.

PLATE NO. 11: Travellers seeking for their respective buses in the Bus Station of Aizawl.

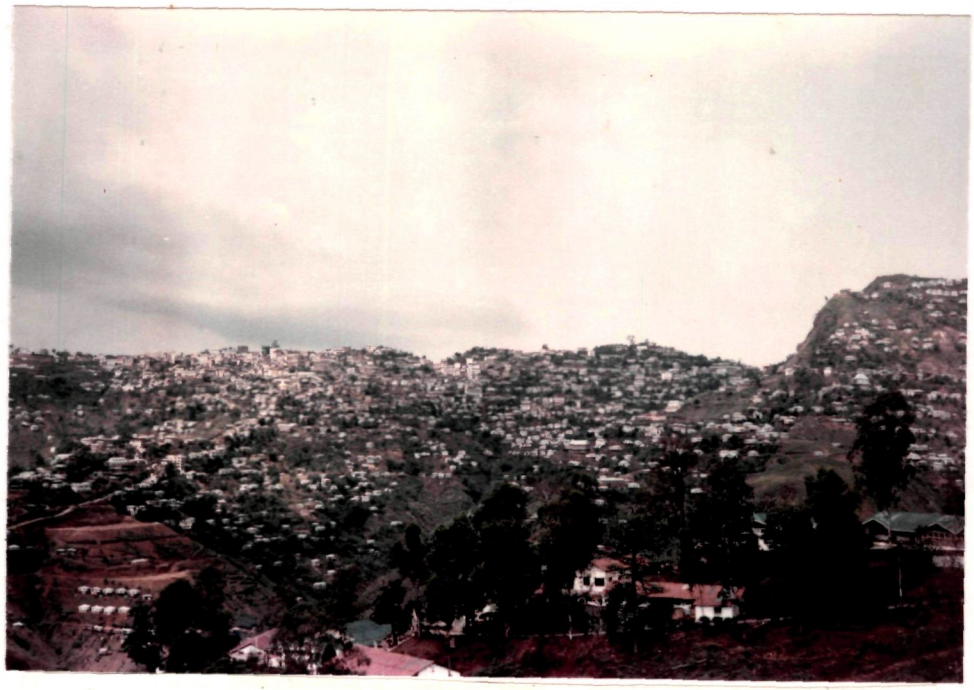

PLATE NO. 12 : A view of Aizawl Town from the eastern side.

PLATE NO. 13 : Enthusiastic spectators of a Football Match; an example of recreation.

PLATE NO. 14
The main street of Aizawl Town

PLATE NO. 15: The busy market of Aizawl Town.

CHAPTER IV

ECONOMIC STRUCTURE

The study of the economic structure of a region is a very important aspect of study since it reflects an interesting features of various economic attributes. In fact, the economic study reveals the capacity of growth, standard of living, major activities of the people, strength of sustenance and helps in formulation of developmental plans.

OCCUPATIONAL STRUCTURE

The occupational structure analysis represents the economic activities of the people. The population is divided into two sections i.e., workers and non-workers. The Census of India classified workers into nine Categories.[1] viz.(I) Cultivators; (ii) Agricultural Labourers; (iii) Livestrock, Orchards and allied activities; (iv) Mining and Quarrying; (v)(a) Manufacturing, processing, servicing and repairing, household industry, (b) Manufacturing, processing servicing and repairing other than household industry; (vi) Construction (vii) Trade and Commerce; (viii) Transport Storage and Communication and (ix) Other Services. Nine Categories of workers are normally grouped into three economic activities viz. Primary economic

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1. Census of India, 1981. Series No.31 Mizoram, General Economic Tables & Social & Cultural Tables. Part III-A & B, Part IV- A.

activities including categories 1,2, and 3; the Secondary economic activities include categories 4 and 5, and the third is Tertiary economic activities consisting of categories 6, 7, 8 and 9.

Mizoram is an agricultural region and most of its population is engaged in agricultural activities. Primary sector is the main occupation of the people (73.84 percent) while the other two sectors found only 26.14 percent i.e., Secondary (2.21 percent) and Tertiary (23.93 percent).

The total workers engaged in primary sector is recorded as 73.85 percent. The urban workers in this sector accounts for 29.31 percent whilst rural workers in the same sector accounts for 84.72 percent. The share of workers in Secondary and Tertiary sectors are very low. The rural population participation in Secondary activity is 0.86 percent as against 7.77 percent for urban workers. In Tertiary sector, workers accounts for 23.93 percent for total, 14.52 percent and 62.91 percent for rural and urban.

It is to be seen from the table (Table 4.1) that Primary sector constituted the highest share in all the districts. The participation rates in Primary sector in Aizawl district is 72.98 percent, 72.24 percent in Lunglei and Chhimtuipui has the highest percentage i.e., 79.95.

AGRICULTURAL ACTIVITIES

Agriculture is rightly regarded as the basic industry and the main-stay of the majority of the people. Mizoram is predominantly an agricultural region where 75 percent of population live in rural areas and depend on agriculture directly or indirectly for their livelihood. Due to the absence of minerals and major industry in the State, about 80 percent of the population is engaged in agricultural activities.

LANDUSE:

Land resources play a strategic role in the determination of man's economic, social and cultural progress. Land economists recognize seven classes of landuse. Agriculture is by far the most significant class of land use measured in terms of amount of land and percentage of total population involved.

Out of 21 Lakhs hectares of the total land area of Mizoram, so far only 67,000 hectares of land representing 3.2 percent is under cultivation. Due to the difficult terrain and absence of power, irrigation is very insignificant. Only about 0.27 percent of the total cropped area is irrigated. It is estimated that only 0.03 percent of cultivated area is under the use of fertilizers. Permanent cultivation covers about 1.4 percent of the area whereas forest area covers about 34 percent of the total area. Total area teraced is 8176 hectares.

MAIN WORKERS BY AGE & SEX

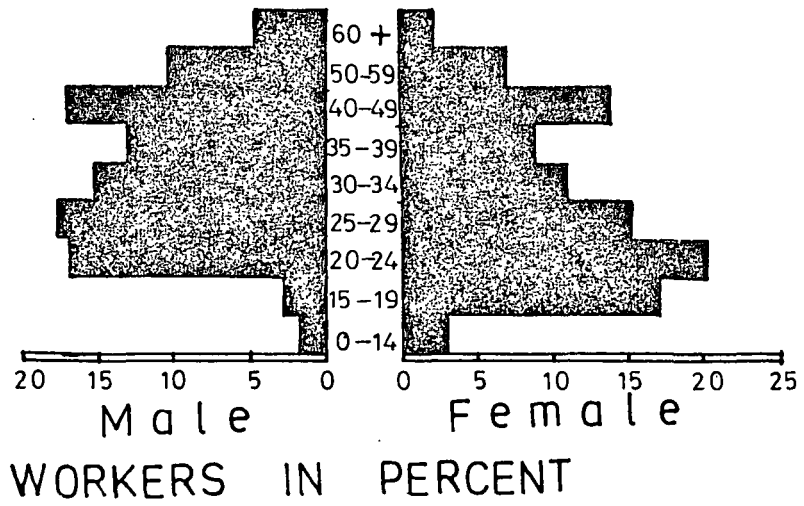

Fig.14.(a).

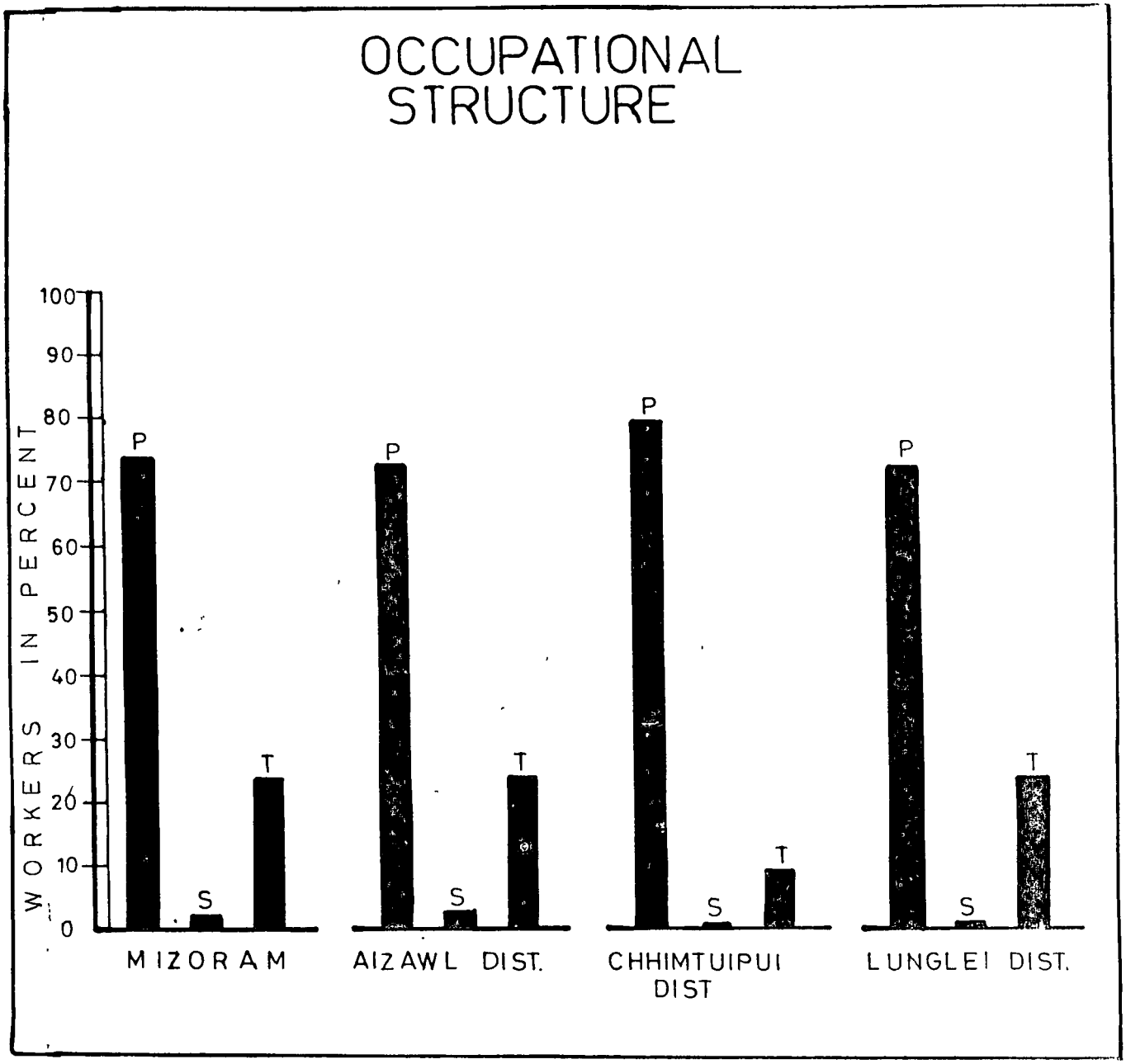
OCCUPATIONAL STRUCTURE
WORKERS IN PERCENT
100
90
80
70
60
50
40
30
20
10
0
P
S
T
MIZORAM
AIZAWL DIST.
CHHIMTUIPUI DIST
LUNGLEI DIST.

Fig.14.(b)

The Secondary activities constituted a very small share. It is 2.77 percent in Aizawl, 1.29 percent in Lunglei district and only 0.65 percent in Chhimtuipui district. This proves that the region is industrially backward and Secondary activities such as manufacturing, processing and the like are very insignificant. The Tertiary sector found a little higher position in the region as compared to Secondary activities. In Aizawl district, the workers engaged in Tertiary sector found 24.23 percent. It is slightly higher in Lunglei district which has 26.46 percent and lowest in Chhimtuipui district with 19.38 percent;

Another conspicuous characteristic is that the participation ratio of rural workers is comparatively high in Primary sector while it is lower in Secondary and Tertiary sectors. In Mizoram as a whole, the rural workers in Primary sector accounts for 84.72 percent while it is only 0.86 percent in Secondary and 14.52 in Tertiary sector. On the other hand, the urban workers in Primary Sector accounts for 29.91 percent, 7.77 percent in Secondary and 62.91 percent in Tertiary sector. This phenomena is all true to each district. The imbalances in rural and urban workers in each occupational sector is due to the fact that Mizoram, having rural and agricultural economy, has to depend mainly on primary activities where land is available in the rural areas; and the urban areas have to depend mainly on Secondary and Tertiary occupation.

TABLE NO.4.1

DISTRIBUTION OF MAIN WORKERS IN PRIMARY, SECONDARY AND TERTIARY SECTORS

State/ District	Total/ Rural/ Urban.	Total main workers	Primary		Secondary		Tertiary	
			Total	P.C	Total	P.C	Total	P.C
MIZORAM	T	206064	152176	73.84	4563	2.21	49316	23.93
	R	165631	140325	84.27	1428	0.86	24060	14.52
	U	40433	11851	29.31	3114	7.77	25437	62.91
Aizawl	T	140723	102710	72.96	3912	2.77	34101	24.23
	R	100218	83201	86.12	1085	1.00	13913	12.35
	U	32510	9315	28.66	2800	8.63	20253	62.29
Lunglei	T	36031	26029	72.24	468	1.29	9535	26.46
	R	30289	24442	80.69	223	0.73	5620	18.55
	U	5742	1587	27.61	245	4.26	3915	68.13
Chhimtuipui	T	29305	23432	79.95	191	0.65	5682	19.38
	R	27128	22532	83.61	99	0.36	4348	16.02
	U	2177	1066	48.96	93	4.27	1345	61.78

Source: Census of India 1991, Series 31- Mizoram. General Economic Table and Social and Cultural Tables, Part III - A & B, Part IV - A.

In Mizoram there is no proper classification of land utilization. As such, the present analysis deals mainly with the general classification of land use in Agricultural land use. The Agricultural land use class in Mizoram includes two types of agriculture:-

a) Slope cultivation locally called shifting or Jhum cultivation.

b) Valley cultivation or Permanent cultivation.

a)Slope/Jhum cultivation: Jhum or shifting cultivation is the principal method of cultivation. About 40,000 hectares of land was put under jhum cultivation in 1984-85. Jhuming is a wasteful means of cultivation with low yield, but which cannot be avoided in a backward region like Mizoram. Average yield in jhum cultivation is abomt 12 quintals per hectare.

The Village people select suitable area of jungle for cultivation in the early month of the year. The vegetation is cleared and burnt and variety of crops are grown on the soil nourished by the ashes. The cultivators is then busy with constant weeding till the harvest.

Mixed cropping of rice, maize, vegetables like Pumkins, beans,Cucumber, brinjals, chillies, cotton, tobacco etc. is practised. Maize is harvested just after the monsoon. Paddy, the principal crop is harvested in October-November

in most of the areas of the State. In the western part, an early variety of rice is grown which is harvested in August. The jhum cycle has decreased from 10 years to 3 years during the last decade.

b) Valley or Permanent cultivation: Only about 3.2 percent of the total geographical area is put under cultivation, out of which 1.4 percent is under permanent cultivation. Though agriculture is practised elsewhere in the region, permanent cultivation is confined only in the valleys e.g., Champhai (715 hectares), S.Vanlaiphai, Thenzawl etc. Due to the hilly terrain most of the river valleys are narrow, and possibilities of permanent cultivation are small. This type of cultivation covered an area of 7000 hectares in the State in 1984-85. Average yield per hectare is about 21 quintals.

CROPPING PATTERN:

Spatial variation in the amount of rainfall, nature of soil, hill terrain and non-avaailability of irrigation have been resulted in the adoption of single crop pattern in Mizoram as a whole. Double cropping of Paddy is practised in the flat land cultivation only. In Jhum all crops are mixed with paddy as the main crop. Therefore, it is difficult to find out accurate figures of areas occupied by different species of crops.

TABLE NO.4.2

RANKING OF CROPS

Name of District	FIRST RANKING OF CROPS 1979-'80 Crops	Percentage(Area)	1983-'84 Corps	Percentage(Area)
Aizawl District	Paddy	78.39	Paddy	79.76
Lunglei District	Paddy	75.59	Paddy	78.72
Chhimtuipui District	Paddy	87.58	Paddy	83.52
	SECOND RANKING OF CROPS			
Aizawl District	Ginger	4.60	Maize	6.93
Lunglei District	Sugarcane	5.59	Maize	6.93
Chhimtuipui District	Maize	4.43	Maize	10.37

Source: Directorate of Agriculture, Mizoram, Aizawl.

TABLE NO. 4.3

GENERAL CROPS STATISTICS.

AVERAGE AREA, PRODUCTION AND PERCENTAGE OF AREA UNDER TEN CROPS - 1979-80(Area in hectares, Production in Quintal)

Name of District		Paddy	Maize	Ginger	Sugarcane	Pulses	Potato	Sweet Potato	Oilseeds	Cotton	Tobacco
1		2	3	4	5	6	7	8	9	10	11
Aizawl District	A	408.20	2145.60	2400.23	2334.78	265	610	328	1710	734.72	719
	P	1568.05	11253	144020.65	466605.5	1280	35550	4932.03	5311	1180.03	2743
	A%	78.39	4.12	4.60	4.48	0.50	1.17	0.62	3.28	1.41	1.38
Lunglei District	A	13500.70	905	460	999.31	157 .21	102	230.44	727.23	382	396.14
	P	98502.15	5602.52	27680	199801	560	8200	3451	2265	540.56	1512
	A%	75.59	5.06	2.57	5.59	0.88	0.57	1.29	4.07	2.13	2.2
Chhimtuipui District	A	8880	450.07	45	268	28.45	38.07	42	220.21	142	125.36
	R	3670 .53	3150.78	4600.73	33602.09	10.20	1250	625	814 .55	220.33	483
	A%	87.58	4.83	0.44	1.65	0.28	0.37	0.41	2.17	1.23	=1.23

Source: Directorate of Agriculture, Mizoram, Aizawl

TABLE NO. 4.4

GENERAL CROP STATISTICS

AVERAGE AREA, PRODUCTION AND PERCENTAGE OF AREA UNDER TEN CROPS - 1983-'84(Area in Hectare and Production in Quintals).

Name of the District		Paddy	Maize	Ginger	Sugarcane	Pulses	Potato	Sweet Potato	Oilseeds	Cotton	Tobacco
1		2	3	4	5	6	7	8	9	10	11
Aizawl District	A	30897.7	2684.92	622.65	644.2	1039.85	220.5	493.3	821.4	590.85	721.85
	P	272385.83	28570.6	53353.6	33762.9	173564	4064	12127.6	4137.2	2357	3763.35
	A%	79.76	6.93	1.60	1.66	2.36	0.56	1.27	2.12	1.52	1.86
Lunglei District	A	666.10	1105	65	55	200	7.8	68	193	43	65
	P	32715.3	4050	537.50	1505	1548	280	2438	1050	84	67
	A%	78.72	13.04	0.76	0.64	2.36	0.09	0.80	2.27	0.50	0.76
Chhimtuipui District	A	10105.90	1255.50	260	8.50	195.50	33.50	79.55	233	63.20	97.70
	P	42030.45	20785	40	64	970.5	245	1205	1236.5	85	20
	A%	83.52	10.37	0.21	0.07	1.61	0.27	0.65	1.92	0.52	0.80

Source: Directorate of Agriculture, Mizoram, Aizawl.

Ranking of crops gives an insight into the cropping pattern. Here, the ranking method has been used to see the relative strength of the selected crops in each district of Mizoram for the year 1979-80 and 1983-84.

The first ranking crop is paddy for the State as a whole. Paddy cultivation covered about 80 percent of the total cultivated land in 1980. At district level, Chhimtuipui has the highest paddy acreage i.e., 88 percent. Aizawl district has 78 percent and Lunglei district has 76 percent under paddy cultivation. Paddy remained the first ranking crop in 1984 with 81 percent area though there is slight change in district level. Chhimtuipui shows reduction of paddy area from 88 percent in 1979-80 to 84 percent in 1983-'84 . On the other hand, Aizawl and Lunglei experienced an increase by 2 percent and 3 percent respectively.

In 1979-'80, the three districts have different crops as second rank. Ginger is the second ranking crop in Aizawl district, Sugarcane in Lunglei district and Maise in Chhimtupui district. Ginger, the second crop in Aizawl district shares about 7 percent while sugarcane in Lunglei district covered 6 percent area and Maize, the second crop of Chhimtuipui district covered about 4 percent of the cropped area. It is to be noticed from the Table 4.2 that there is quite an interesting change in the cropping pattern

of the region from 1979-'80 to 1983-'84, relating the second ranking crops. As already mentioned Maize occupies second rank in the Chhimtuipui district only. But it became second rank crop for the other two district i.e., Aizawl and Lunglei in 1983-'84. In Chhimtuipui district, the Maize acreage is increased to 10 percent. In Lunglei, it is 13 percent and 7 percent in Aizawl district.

The other important crops are Pulses, Potato, Sweet Potato, Oilseeds, Cotton and tobacco. Pulses are grown all over the region and ranks third in Mizoram with a percentage area cover of 2.21. Oilseeds is also grown extensively in the region. It covers 2.10 percent of the total cropped area. All the other crops, excepting tobacco, with 1 percent coverage are insignificant in terms of acreage since they occupies less than 1 percent of total cropped area respectively.

CROP PRODUCTIVITY:

The unscientific method of cultivation and certain geographical factors like terrain, unequal distribution of rainfall and climate, poor nature of the soils etc. have hindred the crop productivity in the State. Here, ten crops, in accordance with the availability of statistics, have been selected for analysis. The average area, production and percentages of area under ten selected crops of

TABLE NO.4.5

AREA,PRODUCTION AND AVERAGE YIELD OF FIVE MAJOR CROPS(1983-1984)

(Area in Hectare, Production in quintals and Yield in Kg. per hectare).

Name of Distr ct /State		Paddy	Maize	Ginger	Sugarcane	Pulses
Mizoram	A	47670.7	5045.42	713.65	707.7	1435.35
	P	367129.58	53413.60	54431.1	3533.19	176082.5
	Y	770	1058.86	7627	499.2	12267 .56
Aizawl District	A	30897.7	2684.92	628.65	644.2	1039.85
	P	272383.83	28578.60	53853	33762.9	17356.64
	Y	881	1064.4	8649	5241.1	1669.0
Lunglei District	A	667.18	1105.0	65.0	55.0	200.0
	P	52715.3	4050	537.5	1505.0	1548.0
	Y	790	366.5	826	2736	774
Chhimtuipui District	A	10105.90	1255.5	26.0	8.50	195.5
	P	42030.45	20785	46.0	64.00	670.5
	Y	415	1655.5	176.0	752.0	496.4

source: Directorate of Agriculture,Mizoram,Aizawl.

PRODUCTION OF CROPS
1983-'84 & 1984-'85

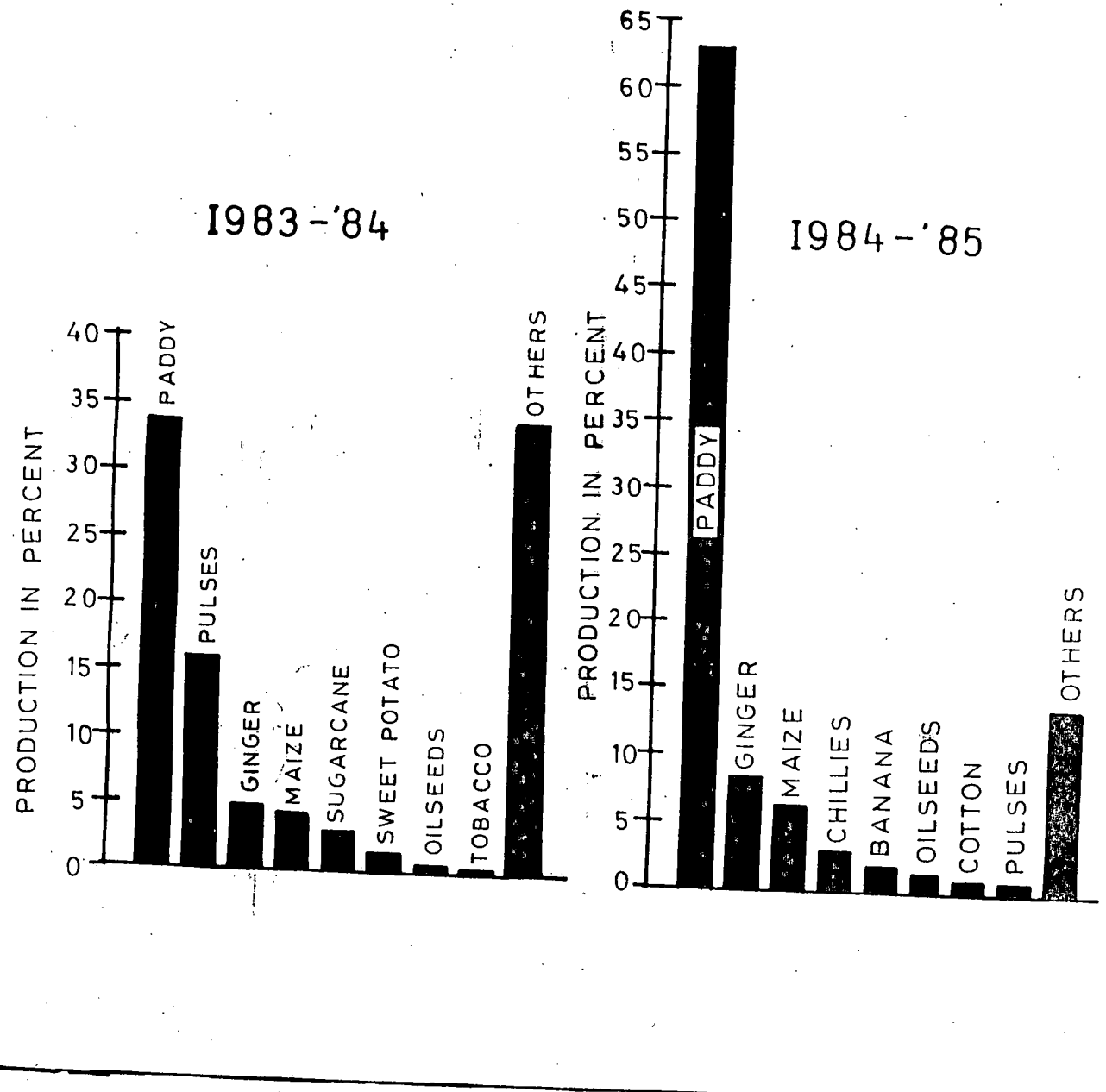

Fig.15.

1979-'80 and 1983-'84 are presented in Table No.4.3, and 4.4. Average yield of the five major crops are shown in Table No.4.5.

It can be seen from the Tables that the production of Paddy has come upto 3,67,130 quintals in 1983-84 from 86,324 quintals in 1979-80. This shows that the average yield per hectare has increased to 770 Kg. from 409 Kg in 1979-80. The application of manures and better facilities can be attributed to the increase in production. The yield of Maize is 1059 Kg in 1983-84 as against 571 Kg in 1979-80, while the yield of ginger is 7627 Kgs and 6000 Kg per hectare for the same period. The yield of sugarcane is 499 Kg and Pulses has a yield rate of about 123 Kg per hectare in 1983-84.

LIVESTOCK AND ANIMAL HUSBANDARY:

Livestock plays a very important part in economic development, being used as a medium of exchange in the past. It still occupies a place of social prestige and economic strength in the lives of the people. The development of livestock is, therefore, of vital importance for the economic development in the region especially in the rural areas.

Mizoram, according to the latest Livestock and Poultry Census, 1982, had a total livestock population of 16,48,584. Out of the total livestock population, duck and

poultry are dominant sharing about 41 percent respectively. Pig is another important domestic animal in the State which contributed about 7 percent to the total livestock population. Cattle and Mithun shared about 3 percent, goat and dog have a population about 1 percent and the rest such as sheep, horses and Mules Buffaloes etc. have a negligible share of less than 1 percent. The detailed statistics is given in Table No.4.6.

Prior to the formation of Union Territory in 1972, there was no significant impact in the field of Animal Husbandary and veterinary in Mizoram. From 1972 onwards, Animal Husbandary and Veterinary and Dairy farming was gradually improved. At present, Mizoram has 5 Cattle farms, 4 Piggery farms, 1 Fodder Farm, 2 Duck Farms, 8 Poultry Farms and 1 Brooder Chic farm. Apart from this the region is also supported by 2 Veterinary Hospitals, 27 Veterinary Dispensaries and 64 Rural Animal Health Centres, Feed Mills and 1 Feed Analytical Laboratory. The Arimal Husbandary and Veterinary Department has installed 115 numbers of Biogas plants.

Inspite of all these, the meat, milk and eggs requirement of the people of Mizoram is well above the region's supply. At present, the price of milk, meat, and eggs is one of the highest in India because more than 50 percent are imported from outside. Stepping up of production coupled with systematic marketing facilities could

TABLE No.4.6

LIVESTOCK AND POULTRY IN MIZORAM, 1987

(Quantity in numbers)

State/ District	Cattle	Buffaloes	Mithun	Sheep	Goats	Horse/ Ponies	Mule	Donkey	Pig	Dog	Poultry	Duck
Mizoram	52,072	4,331	49,768	882	27,539	1,419	43	36	1,19156	18441	6,86,867	6,88,040
Aizawl	40,136	3,712	37,983	819	18,808	1,234	10	18	82,071	11,082	4,74,159	4,74,792
Lunglei	6,765	301	5,087	8	5,497	6	-	2	11,334	4,710	1,34,891	1,95,301
Chhimtuipui	5,149	317	6,698	55	3,234	179	33	6	15,755	2,649	77,817	77,947

Source: Livestock and Poultry Census, Mizoram, 1982., Directorate of Animal Husbandry & Veterinary Mizoram, Aizawl.

bring the required protein foods to the people of Mizoram. And greater emphasis has been given by the state government to improve quality of livestock and Poultry in the region.

PLATE NO. 16
Vegetation is
cleared and burnt
for Jhum cultivation

PLATE NO. 17 : Jhumland just after the burn.
Ashes replenish the fertility of the soil.

PLATE NO. 18: Champhai valley is the largest permanent wet rice field in Mizoram.

PLATE NO. 19 : Jhumland ready for sowing crops.

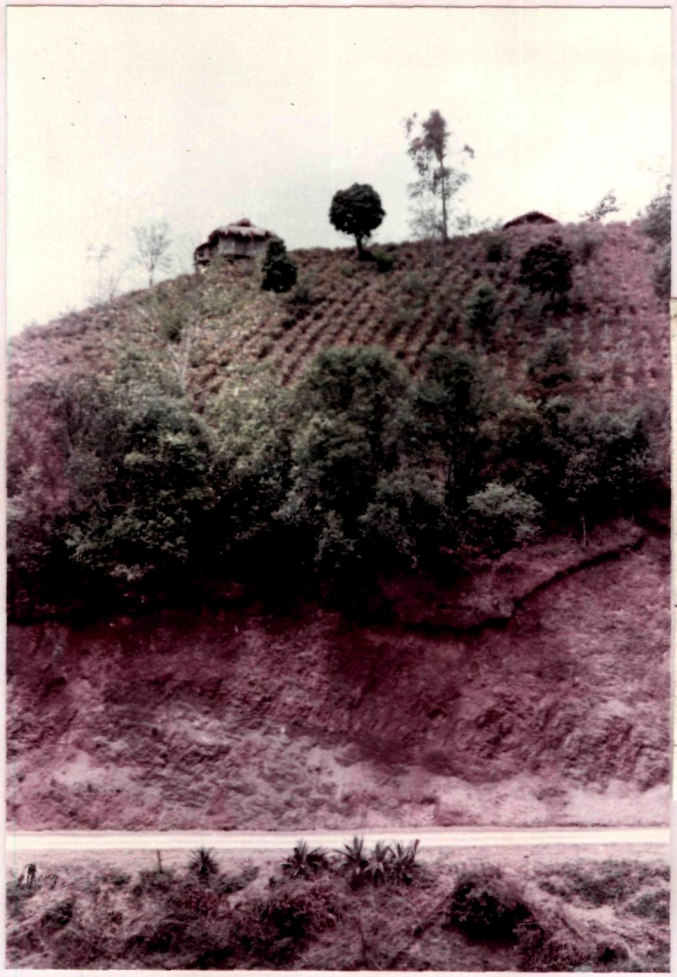

PLATE NO: 20
Pineapple cultivation
near Champhai in the
eastern part of Mizoram.

PLATE NO. 21 : Wet rice cultivation at
Champhai Valley.

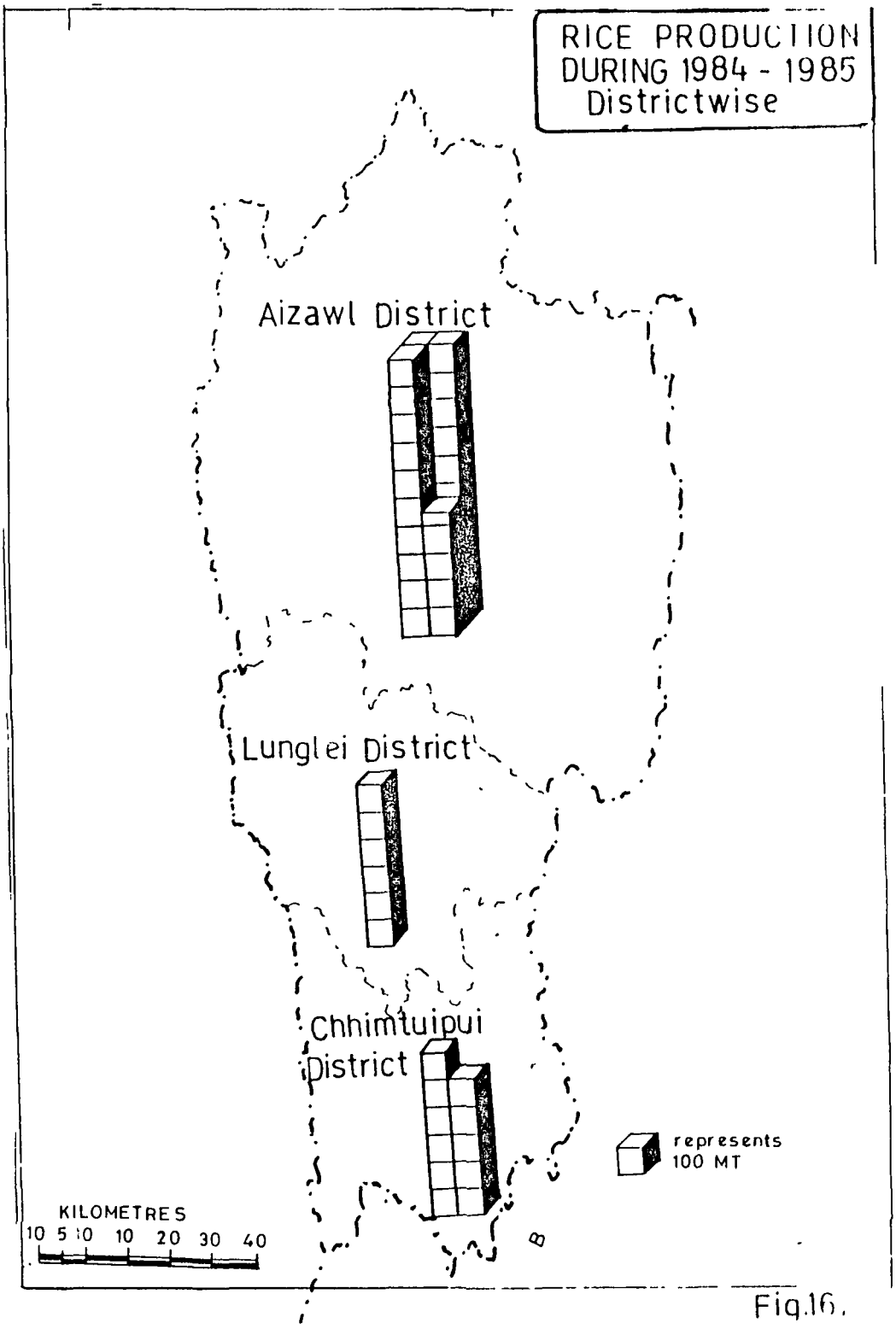
RICE PRODUCTION
DURING 1984 - 1985
Districtwise
Aizawl District
Lunglei District
Chhimtuipui
District
represents
100 MT
KILOMETRES
10 5 0 10 20 30 40

Fig.16.

FORESTRY

Mizoram has a large area under forest cover. About 75 percent (15,935 sq.Km) of the total area of the State is covered by forest of different types. The region, in the past, had a luxuriant growth of variety of species ranging from Tropical to Sub-Tropical trees, comprising of much valuable economic resources. But the forest wealth of Mizoram has undergone a serious degeneration due to continuous jhuming, heavy exploitation and maltreatment by burning and lumbering which resulted in replacement of timber species by bamboos, scrubs and grasses and into barren lands.

The principal factors which influence the distribution of forests in the region are altitude, climate and nature of soil. The forest of Mizoram can be simply described as wooded forests in the higher altitude and bamboo forests in the lower ridges normally below 600 metres to the reverine belts. The forest type in Mizoram are broadly classified into three types such as :-

1) Tropical Wet Evergree Forests.

2) Tropical Semi-Evergreen Forests.

3) Montane-Sub-Tropical Forests.

1) Tropical Wet-Evergreen Forests: This type of forest is found in places where precipitation is high. It is found o

abundantly in the western part of the region extended from southern most part along the western boundaries with Bangladesh and Tripura till Cachar district.Dominant timber species of this forest type are Gmeline Arborea (Thlan-vawng), Michelia Champaca(Ngiau), Amoora Wallichi(Tatkawng) and Dipterocarpus(Lawngthing).

2) Tropical Semi-Evergree Forests: The forest of this type covers about 50 percent of the total geographical area of Mizoram. It occupies the central part of the region from Chhimtuipui river in the south to Manipur border in the north. Important timber species are Schima Wallichi (Khiang), Cedrela loona (Tei), and Terminalia(Char).

3) Montane-Sub-Tropical Forests: The Montane-Sub-Tropical Forests occupy a higher elevation, mostly in the eastern fringe of the region. They are also found in strips of ranges in the western part around Bunghmun and isolated in Sangau area in the south. Pine, Rhododendron and dwarf trees as well as grasses are the dominant species.

FOREST PRODUCE: Forest form the basic resource of the region's economy. Forests are said to constitute the lungs of the country but in the case of the hills they represent the very soul of the people living there.[1]

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1. Gupta D.P., Forest Development in Hill Areas: People's Perception and Problem of Participation.

Rupees 29.44 Lakh revenue was obtained from Forestry during 1985-'86 in Mizoram. The forest products in Mizoram can be described briefly as follows:

1) Timber: Timber is the major product of forests in Mizoram and forms the main source of revenue as far as forest economy of Mizoram is concerned. The important timber species available in the State are:

a) Michelia Champaca(Ngiau)
b) Schima Wallichi (Khiang)
c) Cedrea loona (Tei)
d) Dutanga Sconneratioidis (Zuang)
e) Gmiline Arborea (Thlanvawng)
f) Amoora Wallichi (Tatkawng)
g) Terminalia Myriocarps (Char)
h) Schorea Assamica(Assam Sal)
i) Pines Khasya (Far)
j) Diptero Carpus(Lawngthing).

2) Firewood: Firewood is the main fuel which is largely used for cooking purpose and other domestic use owing to the absence of mineral fuels. With the increase in consumption of the fuel, forest trees are gradually exhausted and firewood collecting has become popular occupation in Mizoram. It is also used in the form of charcoal.

3) Bamboos: Bamboo is another important forest product of Mizoram, and in fact, it is the only forest resource which can support the future forest based industry. It is used for construction of houses, fencing and for making handicraft items such as baskets, hats and embroidery. Large amount of bamboo in Mizoram is exported to the neighbouring Cachar district of Assam.

4) Canes: Cane is one of the valuable forest products of Mizoram. They are found only under dense forest. The estimate avaailability in 1975 was about 8,96600 running metre and the annual average utilization is 166320 running metre. The economic utilities of cane are furnitures, household accessories such as basket, carrier thread and domestic articles.

5) Broom: Broom is found mainly in the semi-evergreen forest. It is available abundantly in the State and large quantity of broomsticks are exported to the neighbouring States every year.

6) Thatching Grass: This is mainly used for roof in the Villages. Important species are Thilthek and Di, found on slopes of mixed forest under poor soil condition. Out of the total estimated available thatching grass in Mizoram, only about 12 percent were utilized in 1975.

7) Cinnamom: Cinnamom(Thakthing) is found in the hill forest. It is another important forest product of the State. The estimated availability was 7300 quintals and only about 36 percent was economically exploited.

DEVELOPMENT OF FOREST ECONOMY

The main duty of the Forest Department is to regenerate the forests either naturally, wherever there occurs good seed bearers in particular areas of artificially through plantation or both. Apart from the local species, the Forest Department also introduced in their plantation programme exotic species like Teak and Eucalyptus.

The State Forest Department, during 1961 to 1985-86, has brought an area of 67,893 hectares under different plantation. About 35 percent is under Economic Plantation, 34 percent under Fuel wood, 30 percent under Social Forestry. The details of plantation is shown in the following table.

TABLE NO.4.7

STATEMENT OF PLANTATION UPTO 1985-86

(Area in Hectare)

District	Economic Plantation	Quick growing species	Fuel wood	Soil watch	Social Forestry
Aizawl	16861	5883	22015	10124	13427
Lunglei	5768	3410	660	400	4480
Chhimtuipui	1100	900	200	-	2475
Grand Total			67,893 hectares.		

Source: Planning Officer, Forest Department, Mizoram, Aizawl.

During the period 1986-87, an area of 13,917 hectares was also put under plantation.

DEVELOPMENT OF POWER

Mizoram, being characterised by deep gorges and streams, has abundant Hydro Power potentials. But due to inaccessible terrain, the development of Hydro power is still in an infantile stage.

The maiden step in power development was taken in 1962 with the commission of 75 KW Diesel Power Station at Aizawl. The construction of 66 KV Line was taken up from the year 1971 to draw power from Assam grid to Aizawl and the connection was affected in November 1977. Power availability from this system is only 3 MW at present which could meet the power requirement of essential installations only. Keeping in view the future load growth, the need to construct reliable and efficient transmission line was recognised. By 1985, as much as 134 villages were electrified with the total installed capacity of 11.51 MW.[2] This shows that about 80 percent of the villages are not yet connected by electricity.

During the present decade efforts were stepped up to harness the abundant Hydro Power Potentials in the region

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2. Diesel. 10.51 MW and Micro Hydel 1.00 MW .

and few projects were identified. One Micro Hydro Project of 1 MW installation at Serlui 'A' near Aizawl has been completed. Investigation of one Medium Hydro Project of about 15 MW installation at Serlui 'B' near Bilkhawthlir village also has been taken up. Detailed investigation for a major Hydel Project namely Tlawng river at Bairabi Hydro-electrict Project with proposed 160 MW installation has been undertaken and entrusted to National Hydro Electrical Power Corporation which is Central Government undertaking. Investigation and construction of 200 MW Tuivai river Hydro Project has also been taken up by the Central Government.

INDUSTRY

The development in the field of industry is still in the infantile stage in Mizoram. It has not been possible to achieve much development in the field of industry due to lack of technical know-how, shortage of skilled labour, raw materials and power etc. So, whatever industry existed in the region is small scale and cottage oriented.

There were 633 small scale and cottage industrial units (registered) in Mizoram in 1983. Tailoring, Furniture Workshop, Knitting, Bakery, Automobile Workshop, Handloom, Candle making and Blacksmithy are the important units which accounted for more than 80 percent to the total

industrial units. Tailoring is, by and large, the most widespread unit and dominated 24 percent of the total small scale and cottage industries. It is followed by Furniture Works (19 percent), Knitting (10 percent) Handloom (8 percent) and Bakery (6 percent). The traditional Handloom and Weaving,Blacksmithy and Cane and Bamboo works are also numerous, but the actual registered numbers of such units are very few (Table No.4.8).

In Aizawl district, the area being the largest among the districts, industries are numerous and varied. It is to be seen from the table that there were 422 small scale and Cottage industrial units while Lunglei district has 194 units and Chhimtuipui has 17 units only, showing the percentage weight of 66.66, 30.64 and 2.68 percent respectively, for Aizawl, Lunglei and Chhimtuipui district. It can be clearly observed that the position of industrial development Chhimtuipui district is very low due to lack of social amenities and infrastructures like transport, communications etc. as compared to the other districts.

TABLE NO.4.8

NUMBER OF REGISTERED SMALL SCALE INDUSTRIES IN MIZORAM,1983

Name of Trade	Aizawl district.	Lunglei district	Chhimtui-pui district.	Total
1. Tailoring	101	37	12	150
2. Furniture Workshop	77	40	2	119
3. Knitting	40	20	1	61
4. Bakery	27	13	-	40
5. Automobile Workshop	23	10	-	33
6. Handloom	24	12	-	36
7. Candle Making	20	29	-	49
8. Blacksmithy	19	9	-	28
9. Atta/Paddy Dehusking	14	-	-	14
10. Shoe Repairing	13	-	-	13
11. Watch Repairing	12	9	-	21
12. Hotel Industry	8	-	-	8
13. Book Binding	6	-	-	6
14. Cycle/Petromax Repairing	6	-	-	6
15. Radio Repairing	6	3	-	6
16. Photography	6	-	-	6
17. Chow Industry	5	-	-	5
18. Tuibur Making	5	-	-	5

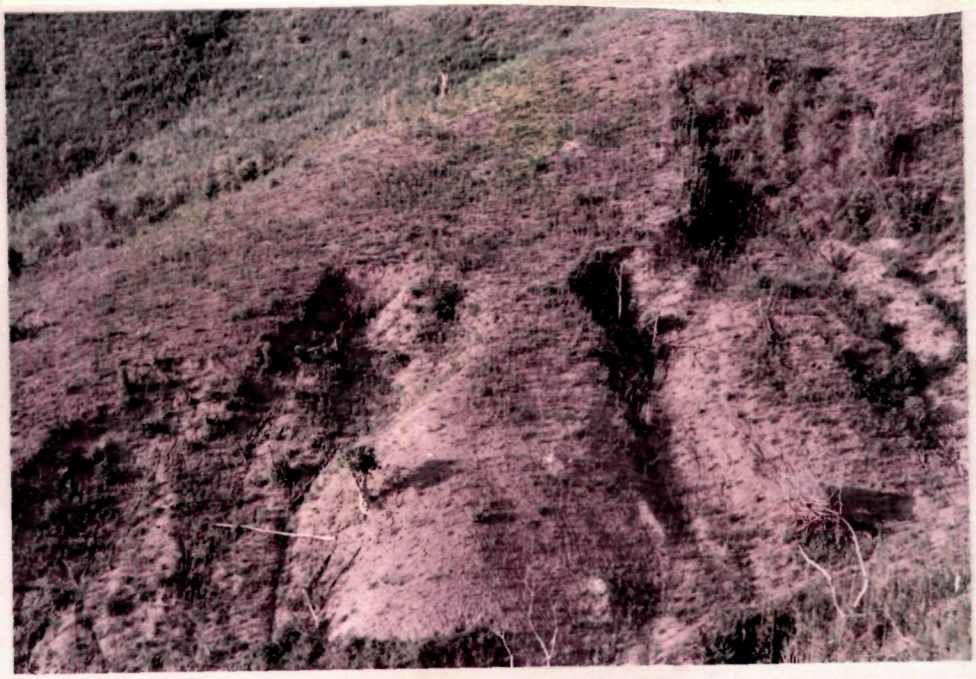
(Table 4.8 continued)

19. Oil extracting	5	-	-	5
20. Electronics	5	-	-	5
21. Printing Press	-	5	2	7
22. Battery Charging	-	5	-	5
23. Dental Workshop	-	1	-	1
24. Brick Making	-	1	-	1
Total	422	194	17	Grand Total 633

Sources: Directorate of Industries, Mizoram, Aizawl and District Industries Officer, Saiha.

PLATE NO. 22: Jhumland and terrace cultivation in the source region of Lungva stream, west of Sialhawk village.

PLATE NO. 23 : Jhumland after the harvest; Note that top soils are severely eroded.



CHAPTER V

TRANSPORT AND COMMUNICATION NETWORK AND SETTLMENT PATTERNS

The development of proper transport system is essential for proper and speedy development of a region. The transport routes are a basic necessity, an indispensable infrastructure and essential prerequiste for any form of development. The present study is not merely concerned with the transport and communication network, but also with the relationship between certain geographical factors such topography, drainage etc. and the development of transport and communication lines as well as the influence of the transport network on the settlement patterns will also be analysed.

ROAD NETWORK

Mizoram is a mountainous terrain characterised by steep slopes and difficult terrain. All other means of transport like Railways, Airways, Ropeways, Waterways are insignificantly developed or absent. The only means of transport available is road transport which is also beset with problems. The Border Road Development Organisation (with 17 BRTF as its nucleas) and the State Public Works Department are the main agency in the development of road network in Mizoram. The network of roads in Mizoram is shown in Fig. 17.

The roads in Mizoram can broadly be classified into three types, namely - 1) National Highway 2) State Highway and 3) District Road.

1) National Highway: Mizoram is connected with only one NationalHighway i.e., National Highway Number 54. This road connects Silchar with Tuipang in the southern corner of the State through Aizawl and Lunglei. The total length of this Highway is 572 Kilometres, but Mizoram portion is 521.70 Kms.[1] The branches of this Highway known as NH 54A and NH 54B link Lunglei and Saiha, the district Headquarters from the main road respectively. The Highway is the most important road at present which facilitates transportation within the State and with the adjoining Cachar district of Assam.

2) State Highway: The State Highway is all weathered, truckable metalled roads. Important roads under this classification are: -

a) Seling-Champhai Road: This road serves as the main route for transport and communications between the central part and the eastern part of Mizoram. It has a length of 150 Kilometres.

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1. Public Works Department., Road Development Plan of Mizoram, Abstract of Statement, Government of Mizoram., P.22.

ROAD NETWORK

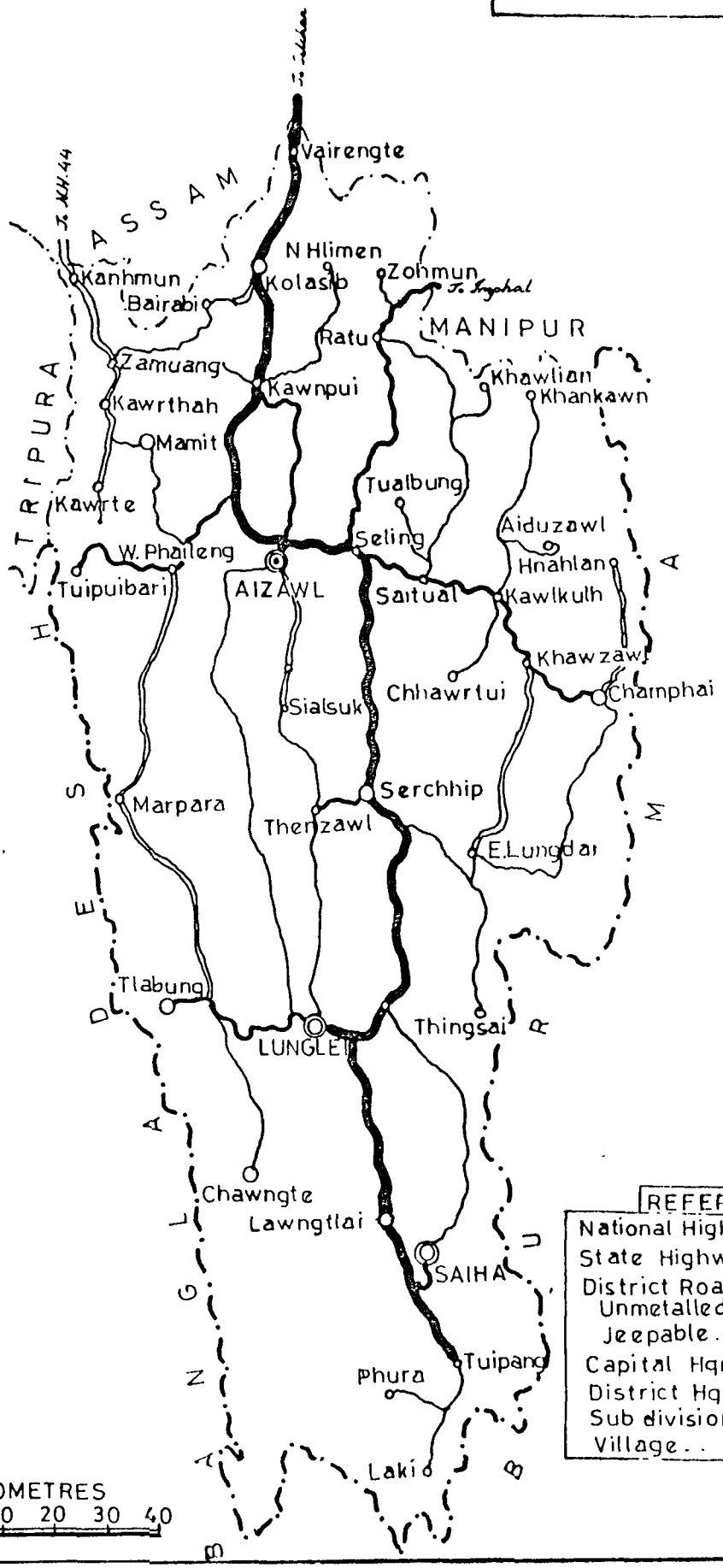

Fig.17

b) Seling-Tipaimukh Road: This road with a length of 139Kms is another important route linking Mizoram with Manipur in the north east corner.

c) Sairang-Tuipuibari Road: This Highway facilitates transportation of goods and passenger from the central part of Mizoram to the western part bordering Tripura and Bengladesh. It has a length of 134 Kilometres.

d) Lunglei-Tlabung Road: This road with 88 Kms long, joins Lunglei town with Tlabung(Demagiri)which is located at the western part of the Lunglei district.

e) Serchhip-Thenzawl: This road is also useful though it has a length of only 34 Kilometres for it links the National Highway 54 with the proposed State Highway which runs from Aizawl to Lunglei in the central part.

f) Kawnpui-Serkhan-Aizawl via Durtlang Road: This road though characterised by steep gradients and blind curves, is useful since the distance is shortened as compared to National Highway 54 which runs through Sairang.

3) <u>District Road</u>: There are numerous District roads in the State. The important lines are:

a) Kanhmun-Kawrtethawveng road: This road is the only route which links the western part of Mizoram with Cachar.It has a length of about 65 Kilometres.

b) Khawzawl-E.Lungdar: This road serves the eastern part of Aizawl district and is of great importance.

c) Aizawl-Lunglei via Thenzawl: This route gives shorter distance from Aizawl to Lunglei and is being improved for State Highway.

d) W.Phaileng-Tlabung via Marpara: This route serves as the most important road in the central western part of the region.

e) There are also number of other district roads such as Kolasib-Zamuang, Daplui-Tuidam, Kawnpui-N.Hlimen,Saitual-Latu,Champhai-N.Vanlaiphai, Tlabung-Chawngte etc. Most of these roads have been taken up for metalling and widening by BRTF so as to convert ther into State Highway.

ROAD CHARACTERISTICS: Road characteristics include the surface conditions of roads, their width, number of lanes, gradients and sharpness of curves. These characteristics are of great significance as they limit or promote the frequency, speed and permissible load of motor vehicle.

Due to ruggedness of the land, the construction of road in Mizoram is of great difficulty. The mountain ranges which run north-south direction favour the North-South construction to some extent while road construction in the east-west direction is beset with numerous obstacles. As

such there are number of blind curves, steep gradients along the Aizawl-Seling-Champhai which follows the east-west strikes.

The condition of road in Mizoram as on 1.4.85 is shown in the following:

TABLE NO.5.1

CONDITION OF ROAD IN MIZORAM- 1985

SlNo.	Type of Road	Length in Kms
1.	National Highway No.54	531.70
2.	District Road:	
	a) Surfaced	790
	b) Unsurfaced	735
3.	Rural Road:	
	a) Surfaced	Nil
	b) Unsurfaced	1,336.30
	Total	3,393.00

Source: P.W.D.,Road Developmental Plan of Mizoram, Abstract Statement Government of Mizoram p.14.

ROAD PATTERN: Physiographic conditions and the level of the economic development directly affect the territorial

structure of Highway network.[2] The pattern of roads of Mizoram has been greatly influenced by topography. The existing road system has been constructed through natural gaps and by cutting the north-southtrending mountain ranges. So that about 70 percent of the present road system are north-south dimensions while the east-west direction shares the remaining 30 percent. The road pattern in Mizoram as a whole can be attributed to rectangular pattern. Yet, certain road patterns are observed in Mizoram such as - a) Parallel pattern in the central and western part of Mizoram joining Aizawl and Lunglei Districts. b) Rectangular pattern in the eastern part. c) Fork pattern in the northern half of Aizawl district. d) Deranged pattern in the western part of Aizawl district and e) Linear pattern in the south.

ROAD DENSITY. While analysing the uneven distribution of road density, it is observed that the areas of high density coincide with areas of low relief and high productivity. On the other hand, the areas of low density are those which have uneven topography and less productive soils. True more rugged the relief of a region, the more persistant is the influence exerted upon location and transportation routes.[3]

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2. Kansky, K.J,: Structure of Transportation network: Relationship between Network Geometry - Regional Characteristics, Chicago p.120.

3. James P.E.:"Geographical Factors in Development of Transportation in S.America", Economic Geography Vol.I. 1925,p.241.

During the British Rule in Lushai Hills (now known as Mizoram) the only roads communication were the bridle paths totalling 703 miles. The Second World War facilitated Mizoram with construction of roads as a result of its strategic location. After the Indian Independence, the development of roads undergone a steady progress. By 1969, the road density in Mizoram was 5.45 Km/100 sq. Km with a total length of 1,149 Kms.[4] In 1974, the density rose to 7.54 Kms. The density again shows an increase with 16.00 Kms/100 sq.Km in 1985.[5] This means that though the density increases the rate is only 0.20 Km per 100 sq. km per year during 1974-1985. During the Decade Plan of Road Development i.e., 1981-2001 A.D, it is expected to construct various motorable roads of different classifications and the road density is expected to be 41.32 Kms by 2001 A.D.[6] Though it may not be possible to connect all villages by roads, whatever villages left out will be at least brought to a walking distance from the roads.

ACCESSIBILITY PATTERN:

In the words of Forbles (1964), "Accessibility is the term which implies to the ease of getting to a place,".[7]

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4. P.W.D.:Road Development Plan of Mizoram, Govt.of Mizoram 1986. p.4.
5. Ibid. p.4
6. Ibid. p.13.
7. Chorely Haggett, "Models in Geography" p.305.

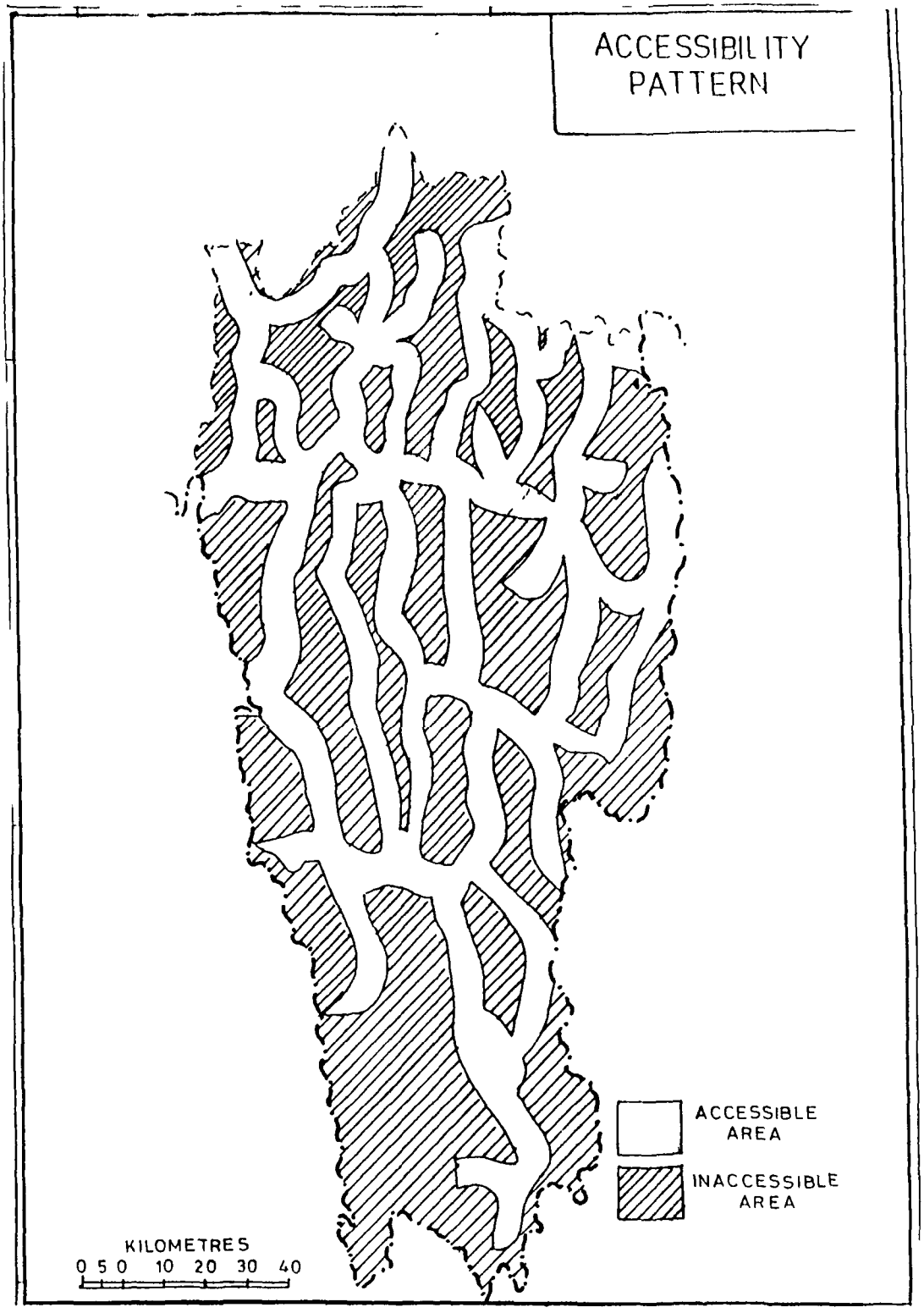
ACCESSIBILITY
PATTERN
ACCESSIBLE
AREA
INACCESSIBLE
AREA
KILOMETRES
0 5 0 10 20 30 40

Fig.18.

According to Winger (1961), "Accessibility in technical sense is a relative quality occuring to a piece of land by virtue of its relationship to a system of transport".[8] B.J.Garner (1967) described accessibility as the variable quality of centrality or nearness to the functions or locations.[9] Accessibility in Mizoram has relationship with geographical factors. The most important one is the physical factors, such as relief, drainage, climate and soils, other factors like economic and social (especially population) factors also affect the accessibility pattern to a great extent. On the other hand, the availability of transport network is an important factor which helps the progress of a particular region.

The accessibility pattern in Mizoram is shown in Fig. No.18. It can clearly be seen that the accessible areas share a lesser percentage than that of the inaccessible areas. The accessible areas are linked by the north-south trending roads in general, and east-west dimensional roads in a smaller case. As stated earlier, the accessibility pattern is influenced by physical factors at the most. The

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8.Chorely-Hagget. Op cit. p.305

9.Ibid p.305.

PLATE NO.24 : Durtlang Leitan (Block Cutting) is the main entrance of Aizawl, the capital town of Mizoram.

PLATE NO. 25 : (a) An example of terrace cultivation (b) Tuirial Airfield, the only existing aerodrome in Mizoram, situated at 24 KM east of Aizawl.

mountain ranges running North-South direction favours the construction of roads in the same direction while it acts as a limiting factor to east-west construction of roads. As a result, the accessibility lines linked the areas by a longitudinal strikes. The east-west construction of roads is faced with several obstacles, for the road has to cross numerous ranges. But the road has to be constructed in the best possible way so as to evade the steep gradients and and difficult curves. As such the east-west roads are constructed in folded lines, cutting numerous escarpments, streams, spurs and rivers. As a result, the distance of the road becomes very lengthy as compared to the distance crowfly.

Other factors like economic, political and social (settlement and population) also exerted much influence upon the accessibility pattern. Towns and important settlements are linked with roads. There is also a tendency to connect with road the areas having economic resources such as an area having fertile soils, forest resources etc.

The inaccessible areas, on the other hand, are characterised either by adverse topography or social and economic insignificance. In other words, the regions with difficult terrain where settlement is sparse and economic activities are absent or insignificant are poorly connected with transport routes. For example, the south-western portion

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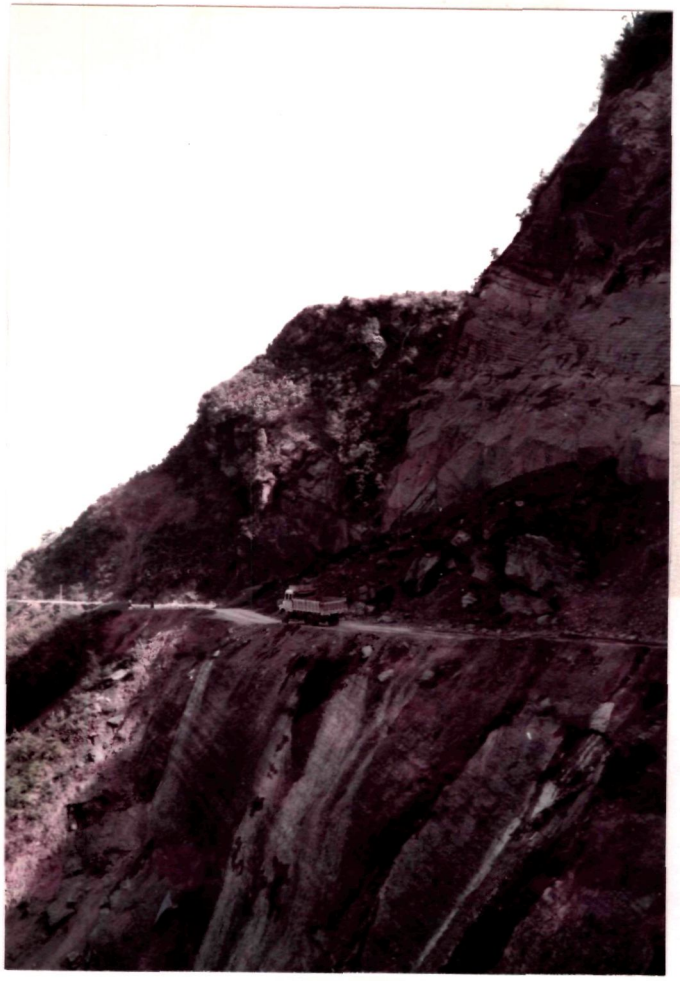

PLATE NO.26
Steepness of slope;
a great hindrance
to road construction

PLATE NO. 27 : Nature of slope and road alignment

of Mizoram is devoid of road network because it has no remarkable economic importance and the settlers are mainly comprised of the Chakma immigrants from Bangladesh as such the State government probably neglect the construction of roads in the area.

PASSENGER TRAFFIC FLOW:

The present study is an attempt to study the flow of passenger traffic along the different roads in Mizoram. But the researcher could not get a detailed data in this respect as such the study is based only on the routes operated by Government Buses.

The Aizawl-Silchar Road (NH 54) has the heaviest daily traffic flow of Mizoram as a whole (Fig.19). There are six Passenger buses up and down everyday encouraging the inter-state travels as well as transport of goods and commodities.

The Aizawl-Lunglei Road which is the extension of NH 54 is the next important route. This route confines 22 percent of the passenger traffic flow of the State with daily four Buses up and down. This route is of great importance as it connects the District Headquarters of the State and the transport of goods and commodities is carried out through this route.

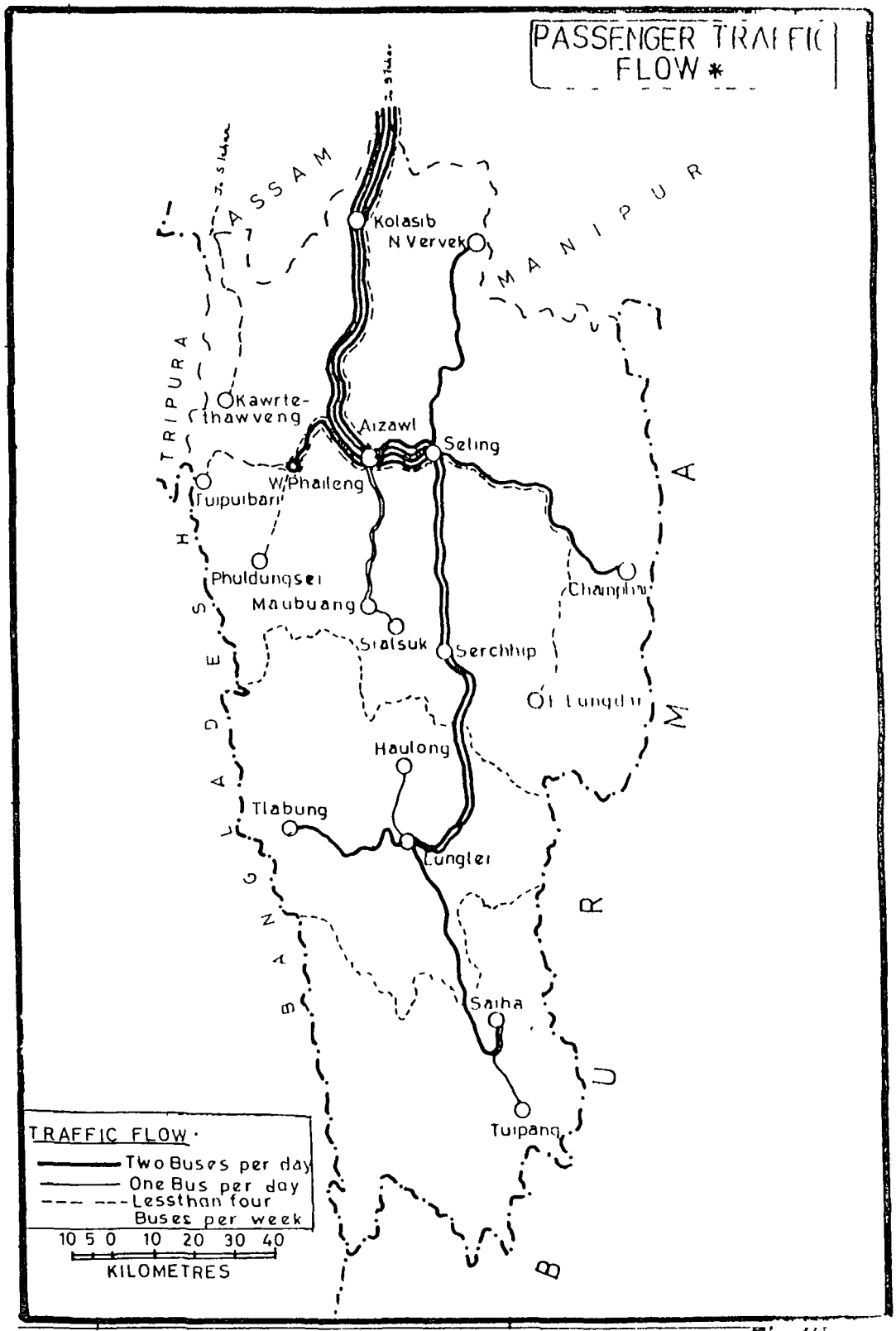

Fig 19

* The only routes operated by Mizoram State Transport buses are shown here

The Lunglei - Saiha road is another important line which shares a little more than 20 percent of the passenger flow in Mizoram. It is the only proper road in southern part of the State as far as transportation is concerned. It is also an extension of NH 54 which is under construction by widening and block cutting. The route is served by two Buses everyday.

The Aizawl-Champhai, Aizawl-New Vervek, Aizawl-Phaileng-Tuipuibari and Lunglei-Tlabung roads are another lines each sharing about 11 percent of the passenger traffic flow. The Lunglei-Hualawng road and Saiha-Tuipang road also favours traffic flow with a daily Bus services respectively.

Besides these, mention may be made to the passenger traffic flow during the dry season in certain routes such as Aizawl-E.Lungdar, Aizawl-Phuldungsei, Aizawl-Kawrtethawveng via Silchar. These roads are covered by the State Buses in dry season at an interval of one or two days. Yet their importance is of great significance for they facilitate the linkage between the interior and remote areas of the region.

SETTLEMENT:

The study of settlement is important as the various aspects of settlements in the region have a direct or indirect relationship with its surroundings. And the analytical study of settlements in respects of their sites, types, spatial pattern and function is essetial to perceive how man has selected his place for dwelling.

GEOGRAPHICAL FACTORS INFLUENCING THE LOCATION AND GROWTH OF SETTLEMENTS:

Geographical factors such as physiography, climate and availability of resources have much influence on the settlement of human race. In Mizoram the settlements are mainly govern by the configuration of land surface, climate, the fertility of soils and water availability. The ethnogenetic factors like traditions, necessities of defence and security and availability of land for traditional jhuming practices have also exerted much influence on the pattern of settlement.

In Mizoram, most of the settlements are located on the hill top while meagre settlements existed on the lower valleys and riverine banks. One of the most important reasons for hill top settlement being the defence purpose for the Mizo were involved in conflicts and constant wars in the past, as it found elsewhere in the historical records. Another reason for hill top settlement is the deficiency of extensive flat lands in Mizoram and the existing small patches of level lands can support only few settlements.

Climatic factors is another important factor which directs the settlement in Mizoram or elsewhere in the world. The hill crests have pleasant climate while the low lying valleys are characterised by humid, warm and sultry weather. Hence the hill tops and crests offer the only alternative

base for human habitation. On the contrary, in certain low-lying valleys and riverine plains where agriculture is favourable settlements tend to come up.

Broadly speaking, the location and feature of settlement in Mizoram can be described as follows:

1) The settlements on the hill-tops and hill slopes.
ii) The settlements along the rivers.
iii) The settlements along the watershed.
iv) The settlements along the main road.

i) The settlements on the hill-tops & hill slopes : The location of settlements on flat hill-tops and gentle hill-slopes terrain was the marked characteristic feature of the hills as defence in the pre-British period being the most decisive factor in the selection of sites for settlements in the early period.

A numerous settlements, both large and small are situated on the hill tops and hill slopes of the state. About 70 percent of the total settlements are located in the hill tops and slopes. The remarkable mountain ranges which support hill tops and hill slopes settlements are the Hachhek Range in the northwest, the Chalfilh-Ratu in the north central, the Sialkal Range in the north east, the Zopui-Tan-Lurh in the east etc. All these ranges are characterised by

high degree of slopes and rugged topography that compels the inhabitants to occupy the hill tops and hill slopes. The hill tops and hill slopes settlements are a common feature in Mizoram and are found numerously throughout the region.

ii) The Settlements along the River valleys: This type of settlements is found on the low lying valleys of perenial rivers where agriculture or horticulture is practicable. The availability of fertile soil is the main factor for the growth of valley settlements. So that the adjoining areas of certain important rivers such as Tut, Teirei, Tlawng, Langkaih, Chhimtuipui, Khawthlangtuipui, and Tuichawng are intervened by a number of settlements.

iii) The settlements along the Watershed: A large number of settlements are found located along and between the watersheds and their distribution varies from place to place. The study of topographical map reveals that quite a number of settlements are located along the watershed formed by numerous tributaries of different river systems or basins. For instance, N.Vanlaiphai, E.Lungdar and Khawbung are conspicuous example covered by Toposheet No. $84^{E}/4$.

iv) The settlements along the main road: The availability of transport routes has also affected the feature of settlement

in Mizoram. As stated earlier, most of the villages in Mizoram are situated on top of the hills. But when motorable road cannot connect them due to various engineering reasons, the villagers are tempted to come down to the road and settle along the main road. By this process, villages like Rengdil, Dampui, New Vervek, Baktawng, Khawhai etc. have come down from their original hill top location to the road sides. This phenomena is seen taking pl ce all along the roads constructed by B.R.T.F. and P.W.D.

SETTLEMENT PATTERNS:

The factors which have led to the variations of settlement patterns are many and varied. It is important to realise that the pattern so produced is a result of a number of forces, working either in conjunction or in opposition, over a long period of time.[10] The settlement pattern in Mizoram is largely affected by various factors like administrative, climate, nature of slopes, relief, fertility of soil, availability of cultivable land, drinking water and newly development of road links.

The settlement pattern in Mizoram can be broadly classified into:

1) Compact and semi-compact pattern of settlement.

2) Linear pattern of settlement.

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10. Hinawma, P.:Geomorphology and Agricultural Development in Lunglei District, Mizoram, Unpublished Doctoral thesis p.279, op cit. .1986.

1) Compact and Semi-compact settlement:

The study of topographical sheets and an extensive field study of Mizoram reveals that about 70 percent of the total settlements are compact and semi-compact pattern of settlements.

The factors responsible for the growth of compact and semi compact settlement seems to be the availability of several patches of gentle and undulating terrain, which can be cultivated and sufficient for shifting cultivation in its surroundings. The settlements are generally located on hill tops and gentle slopes within limited areas demarcated in most places by geographical barriers. Some settlements are also found at the sides of the rivers which can be classified as compact and semi-compact, for example, Bairabi, Hortoki, Kanhmun, Chawngte etc. The social factors can also be attributed to the development of compact and semi-compact settlements in this region for the Mizo families are closely knited that each family tries to build his home as closely to his neighbour as possible.

2) Linear Settlement pattern:

Linear settlement patterns are located in areas of elongated watershed areas where easy availability of drinking water and sunny sides of the slopes seems to be important factors. It is also found along the river valleys as well as

along the main roads where transportation is available. Broadly speaking, there are three types of linear settlement in Mizoram such as a)Linear settlements along the watersheds b) Linear settlements along the river valleys and c) Linear settlements along the main roads.

a) Linear settlements along the Watersheds: Linear settlements along the watershed are due to the availability of water and normal climatic conditions. The watershed areas are characterised by elongated narrow strips of land, with both sides having very steep slope which led to the development of linear pattern of settlement along these watersheds. Some examples of this type of settlement patterns are Kawrthah, Kawlkulh, Mamit etc. in Aizawl district, Sertlangpui, S.Lungdai, Thuampui and Khojoisury in Lunglei district.

b) Linear settlements along the river valleys: A number of linear settlements along the river valleys are found in Mizoram. They are located mostly in the valleys of rivers such as Tuichawng, Tuilianpui and Khawthlangtuipui in the south western part of Mizoram. A remarkable examples in this area are Nunsury, Devasury, Dinthar and Kauchhuah. This type of settlement is also found in Aizawl district such as Tuirial along the Tuirial river, Tutphai along the river Tut and Tuipuikai along the Khawchhaktuipui river.

c) Linear settlements along the main roads: Several linear settlements have come up in Mizoram as a result of development of roads. It is true that the easy accessibility to the road has many advantages. So that the dwellers of the newly established villages or growing villages try to lay their houses as close to the road as possible which resulted in the formation of linear pattern of settlement. Some examples of this pattern are - Tuirial, Dilte and Tuipuikai along the Aizawl-Champhai road, Seling, Khumtung, Kawpui, Pangzawl, Leite, Zobawk along the Aizawl-Lunglei road, Thualthu, Tawipui, Thingfal, Sihtlangpui along the Lunglei-Saiha road.

DENSITY AND DISTRIBUTION OF SETTLEMENTS:

It is a difficult task to trace the origin and evolution of settlements in this region, because there is no integrated historical account of the region as it is occupied by ignorant tribal who have lived for a long time in physical isolation and have no scripts of their own. There is no evidence of pre-historic settlement of this region. Before the advent of the British in this region, the people were isolated from each other due to difficult terrain, dense forest and lack of transport network. The lack of interaction with the outside world added by inaccessibility of the land left them comparatively untouched, and therefore, they remain primitive in character.[11]

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11. Hinawma P., Op cit p.261,262.

It is accepted that in the 17th Century the Mizos, a Mongoloid groups of people came to this region from the centre of Asia(China) through Mekong valley(Burma) and probably settled down in groups at different places, forming villages. They were predominantly agriculturists in the form of shifting cultivation. Being head hunters at that time the hill top is naturally chosen because they could have a better defence for their villages.

The present day selection of sites for settlement in Mizoram has been greatly determined by a variety of geographical factors such as dry and healthy surface of ground, easy accessibility, perennial supply of water for domestic and other purposes, proximity to natural routes in the past or lines of moderate transport, grounds of moderate slope, safety from defence points of views, particularly in the Pre-British period where there was insecurity and political instability. Since they are predominantly agrarian community as much cultivable land as possible is spared for cultivation by selection of elevated sites for settlement on less fertile or sterile patches of land.

The settlements in Mizoram as a whole depict a disperse or random settlement. There are 721 inhabited villages in the State. The density of settlement is highest in Chhimtuipui district i.e., 4.35 settlements per 100 sq.Km.

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12. The density of settlement in Aizawl district is 3.14 per 100 sq.Km and Lunglei district is 3.61/100 sq.Kms.

The numerous settlements along the rivers in the south western parts have helped the density inspite of the fact that the district is hot and sultry as compared to the other districts. The central part of Chhimtuipui district is thinly occupied due to the presence of thick forest and unhealthy climate. In Lunglei district settlements are well distributed. The north-western part of Lunglei district is thinly settled as a result of dissected terrain and the presence of thick forests and a number of streams with deep narrow gorges. The central hills of the district are more thickly populated with compact and linear settlement pattern, where the eastern parts are thinly occupied as a result of high and dissected ridges covered by thick forests.

Aizawl district has a density of 3 settlements per 100 sq.Kms. The north western part is highly occupied with a compact, semicompact and linear pattern of settlements. The rainfall is sufficient in this region and the presence of small patches of cultivable flat lands along the rivers Tlawng, Teirei and Langkaih favour the settlement along the river valleys where the continuous ranges of Sabual and Hachhek supports the hill top settlements. The south western portion is thinly populated; the reason being that the dissected terrain characterised by a number of streams and

deep gorges with a luxuriant forest covering. The settlements in the eastern part of Aizawl district are scattered with a more or less elongated form. Though the presence of mountain ranges with higher elevation and the steep slopes restrict the settlements to some extent, the pleasant climate and the availability of cultivable jhum lands support the growth of settlemts. Settlements are generally located on the crests of the mountains depicting compact and semi-compact patterns. In the central part of Aizawl district settlements are located in an elongated mountain ranges. Being located on the watersheds and along the main roads, the settlement are semi-compact and linear patterns.

URBAN SETTLEMENT:

There are only six urban settlements in Mizoram, viz Aizawl, Lunglei, Champhai, Kolasib, Serchhip and Saiha. According to 1981 Census, Aizawl is classified as Class II town, Lunglei Class IV Champhai, Kolasib, Serchhip and Saiha under Class V respectively.[13] Aizawl, the capital

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13. The Census of India, 1981 classified the towns into six classes according to number of population.

Class I	-	-	1,00,000 above
Class II	-	-	50,000-99,999
Class III	-	-	20,000-49,999
Class IV	-	-	10,000-19,999
Class V	-	-	5,000-9,999
Class VI	-	-	Below 5,000

headquarter of the state has the population of 74,493 persons according to 1981 Census, Lunglei, the district headquarter has 17,205 inhabitants and the rest have less than 10000 population.

The pre-occupation of the British for the pleasant and healthy climate on the hill top and crests and security in terms of politics are the important factors for the growth of Aizawl and Lunglei town. The availability of flat land for wet rice cultivation in the east can be attributed to the development and the growth of Champhai town, whereas the case of transport and communications network and spatial location along the main road are remarkable factors for the development of Kolasib and Serchhip town.

PLATE NO. 28: Champhai street; a typical house type in growing towns of Mizoram.

PLATE NO. 29 : Khawzawl Village; Linear settlement along the road.

PLATE NO. 30 : Compact settlement of Champhai town.

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PLATE NO. 31 : An example of Linear settlement along the road and the river Khawchhaktuipui.

CONCLUSION

In the present study, an attempt has been made to analyse the spatial pattern of the various aspects of regional characteristics of Mizoram, inspite of the fact that there is no adequate and systematic data and information. Considering all the limitations it would be fair to note that the present dissertation is an explanatory and descriptive in nature.

Geologically, the region was formed during the Tertiary Period, which evolved after the regional upliftment of Barail group of sediments. The stratigraphic sequences of Mizoram is represented by five main geological sub-groups of formations such as : i) BokaBil, ii) Upper Bhuban; iii) Middle Bhuban; iv) Lower Bhuban and, v)Barail.

The physical structure of Mizoram is characterised by mountain ranges associated with deep gorges and river valleys. Physiographically, the region is divided into two broad regions, i.e., i) Mountainous terrain Province and ii) Ridge and valley Provinces. The mountain terrain province has an elevation ranging from 400-2158 metres and is found in the eastern part of the region. Ridge and valley provinces are found mainly in the western side of the region with an elevation ranging from 40-1550 metres.

The numerous streams which flow towards north or south due to structural control of the mountain ranges are originated mainly from the central part of the region, and fall into either Barak river of Cachar district of Assam in the north or Bay of Bengal through Bangladesh in the south.

The region falls under the direct influence of south west monsoon as such, it receives adequate amount of rainfall and rainy season is the longest season. Climatically, the region comes under tropical type of climate and there is no much fluctuation of temperature during the year.

The soil type found in Mizoram is clayey and reddish-loam which are acidic in nature due to continuous rain-wash. But the portions which are lying in the plains are rich in alluvium. These soils supported a luxuriant growth of vegetation, ranging from Tropical to sub-tropical species.

The history of the Mizos is hazy in nature and it is rather difficult to trace the origin of the Mizos. Racially, it is admitted so far, that the Mizos are Mongoloid stock who entered the present Mizoram during the middle of the 16th Century from the east.

The study of population growth reveals that Mizoram is undergoing a steady increase in population. The population has been multiplied to nearly six times from 1901 to 1981. The increase during the last decade was 49 percent. The physiographic conditions have put restriction on the size and spatial distribution of population to a great extent that settlements are numerous and scattered here and there. Those areas with suitable environments and better infrastructures are densely populated while the interior parts with adverse geographic conditions are sparsely populated. This phenomenon is also true to the case of literacy.

In terms of scheduled tribe and scheduled caste population it is noted that scheduled tribe population is quite high (94 percent) in the region. Scheduled caste population accounted for 0.03 percent only.

Linguistically, Mizoram is a mono-lingual region. The Mizo language, which belongs to Assam-Burma branch of Tibeto-Burmese family of languages is spoken by majority of the people (79 per cent) of the region. Other languages such as Chakma, Lakher, Pawi and Hmar are negligible as they accounted for less than one per cent speakers.

In the case of religion, it is found that Christianity is the main religion of the land. In fact, all Mizos are Christians and Christian population dominated about 84 percent. Other religions are Buddhism (8 percent), Hindusm (7 percent) Islam, Sikkhism and Jainism (negligible). The working force of the population is estimated 45 percent of the total population, of which rural population contributed about 80 percent of the total workers. In terms of male and female workers, male workers constituted 63 percent while female workers accounted for 37 percent.

The occupational structure analysis clearly depicts that Mizoram is an agricultural region. About 74 percent of the total workers are directly or indirectly engaged in agricultural activities (primary sector); Occupation of secondary and Tertiary sectors found only 2 percent and 23 percent.

The physical environment has also been largely responsible for the economic condition of the region. Though Mizoram is an agricultural region, the production is quite insufficient to meet the food requirement locally. The traditional shifting cultivation(Jhuming) has been responsible for low productivity and yield,but unavoidable yet in the absence of irrigation, power, capital, scientific

implements. Morethan half of the food requirement is imported from other states annually.

The study of cropping pattern of the region reveals that paddy is the principal crop followed by Maize, Ginger, Sugarcane, and Pulses etc. The productivity pattern of crops has also been increased recently with a better and proper management of the fields.

Other agricultural activities such as Animal Husbandry and Dairy Farming, Pisciculture, Horticulture etc. are in an infantile stage and are yet to develop.

Forestry also plays a vital role in the economy of Mizoram. It forms a basic resource of regions economy inspite of the fact that large amount of valuable species have been distroyed in the process of jhum cultivation. Attempt has been made to harness the forest economy through preservation and afforestation.

Keeping in view the presence of numerous rivers and streams, the development of Hydro electric power is very positive. This could form and important sector in the region's economy.

Industrially, the region is very backward due to lack of raw-materials, power, technical know-how and

skilled labour. Though a commendable headway has been made in cottage industries, such as Weaving, Handloom, Cane and Bamboo works, major industries are yet to come up.

The last chapter reveals that physiography has largely been responsible for the patterns of roads and distribution of settlement patterns. It is seen that most of the roads are north-south direction controlled by the strikes of mountain ranges. Mountain ranges with deep gorges and low river valleys from a great hindrance to road construction especially in the east-west direction.

Geographic factors have played a decisive role in the selection of sites for settlement in Mizoram or elsewhere. It is found that in the eastern part of the region settlements are mostly located at crests and watersheds. This is due to the fact that in the eastern part, valleys are narrow, accompanied with hot, humid and sultry weather that suitability for human habitation is less. On the other hand, in the western part, one can notice that numerous settlements are also located on valleys and slopes where they are comparatively wider and not unhealthy. The density decreases from north to south; the most important factor of this trend being the southward increase in humidity and temperature. The density

also decrease from west to east, the rate being greater than that towards the south. Though climatic factors are also involved in this trend, but topographic factors are better attributed to this trend.

The analysis so far suggests that geographic factors, especially physiography have remained the constant factors in influencing the direction and levels of development in Mizoram. It can also be stated that socio-economic characteristics of the State indicate the influence in a smaller or larger measure.

If we look at the over-all conditions of the region, Aizawl district has come out to be the more developed area as compared to the other two districts. This is due to better infrastructural development and spatial location. It is noted that the level of development is lowest in Chhimtuipui district while Lunglei district stands in the mid-point. It is clear that the spatial arrangement of geographical factors such as relief, temperature, rainfall etc. have directly affected the socio-economic characteristics of the region.

SUGGESTIONS:

Based on the study of the regional structure and keeping in mind the problems pertaining to the over all

conditions of the region, the following suggestions may be proposed for the economic development of Mizoram.

1) In view of the necessity of power and the region's potentials, step should be taken in creation and development of Hydro-Electric power.

2) Transport and communication network should be improved so as to connect all the isolated pockets. Being a young topography the road system has to be planned in the light of the charecteristics of landforms.

3) The traditional jhuming system of cultivation should be modified. The topography and the agro-climatic conditions of the area are more suitable for the growth of other crops and plants rather than rice. Yield could be higher if the land is devoted to a single crop on a suitable environment instead of adopting mixed-farming.

4) All the available river flat lands should be reclaimed for wet rice cultivation provided there is adequate water supply.

5) Hill terrace cultivation may be practised in the low lying valleys where the gradient of slope is

gentle. This implies the necessity of hydro-power for gravity irrigation and lift irrigation.

6) Soil erosion aggravated by jhuming should be checked through economic plantation to retain the fertility of soil for future cultivation.

7) Large areas of uncultivated lands could be brought under plantation of timber species like Teak, Sal, Pine, Gomari etc. which could contribute a large amount of revenue to the region's economy.

8) Marketing facilities should be improved and decentralised so that the farmer can sell their agricultural produce at easy reach from their farms at reasonable prices.

9) Based on forest and agro-produce medium scale of Industries, if not large-scale, could be established with the local supply of raw-materials provided other essentials are available.

10) Metrological observatory stations should be introduced at least at sub-divisional headquarters to maintain various climatic data of the region.

11) The areas urgently need to identify and map out the physical features of the region, highlighting

such aspects as the hydrological regions, soil resources, climatic rythms and associated bio-geographical characteristics of the region. Due emphasis should be given to depict on maps the various natural hazards which need to be adequately taken care of in the region.

12) Socio-economic data of the various categories of the villagers should be collected in order to trace out their indifferent attitude towards the adoption of various governmental planning.

13) Surface landslides are the common phenomena throughout the State. To prevent this, Jhuming should not be practised on the steep slopes and along the road section.

14) Steps also should be taken in the field of geological exploration for it has been found that Mizoram has some deposits of limestone and coal.

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