

# CHANGING CROPPING PATTERN UNDER URBAN INFLUENCE

( A CASE STUDY OF TWO VILLAGES AROUND SHILLONG  
URBAN AGGLOMERATION )

**KRISHNA R. SINHA**

*Dissertation*

SUBMITTED

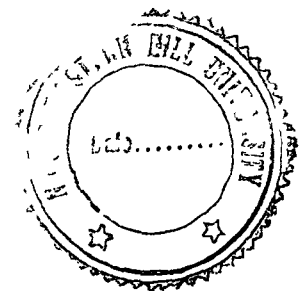
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PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF  
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SCHOOL OF ENVIRONMENTAL SCIENCES  
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This is to certify that the dissertation entitled "**Changing Cropping Pattern Under Urban Impact : A Case Study of Two Selected Villages Around Shillong Urban Agglomeration**", submitted by Krishna R. Sinha, for the degree of Master of Philosophy in Geography Department, North-Eastern Hill University, is a bonafide work to the best of my knowledge and believe and it may be placed before the examiners for evaluation. *This dissertation have not been submitted to any other University or institution for the award of any degree or diploma .*

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KRISHNA SINHA

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CHAPTER - I

## INTRODUCTION

With rapid urbanising process involving the multiplication of points of concentration and increase in size of individual clusters, dynamic changes have taken place in the socio-culture and economy of the rural areas surrounding the urban centres.

These changes has its roots in the increased rural-urban interaction which has resulted from the development of urban transport facilities into the rural areas, as also the insatiable thirst of the city for space resulting in expansion of urban build-up areas along transport arteries.

The rapid sprawl of the modern city outside its political boundaries and beyond its real physical-cultural domain possesses several attendant problems.<sup>1</sup> An important problem in the fringe areas is the problem of landuse. The pattern of landuse in the area is dynamic and changes from rural landuse to urban landuse over short periods of time and distance.<sup>2</sup> A shift from non-residential to residential and foodcrop land to cash-crop land are some of the important changes. The resultant pattern is complex and its real value difficult to assess.

This problem is magnified in tribal areas such as

fringe areas of Shillong. Initially predominated by the primitive practice of shifting cultivation, which still continues, though to a lesser extent, these areas does not have any land record system. Not only this, but records of the operational attributes and of productivity is non-existent. Thus a measure of the extent and degree of urban influence in agriculture and agricultural landuse in these fringe areas becomes a difficult task.

#### The Concept of Rural-Urban Fringe

The term "fringe" suggests a border-line case between the rural and the urban, and actually lies in the periphery of urban areas, surrounding it and distinguishing it from the truly rural country-side. Singh (1961) has described fringe as "the rural land with urban phenomena".<sup>3</sup> Wehrwein explains the rural-urban fringe as consisting of "rural territories pierced by fringe like projection of urbanised landuses, because of the stellar growth of the city and is the area of transition between well recognised urban landuse and area devoted to agriculture carried out in more or less modified form."<sup>4</sup> According to Dickinson the urban fringe is an area "on the outer borders of the city, between the area of urban and rural landuse, an intermediate zone which shares the characteristics of each."<sup>5</sup>

It can be seen that landuse pattern has been commonly employed as a definitive variable to distinguish the urban

fringe from other areas. The area over which the town extends as a result of urban growth and dispersion, develops a distinctiveness. This area is only partly assimilated into the growing urban complex, and still partly retains its rural character.<sup>6</sup>

The whole rural-urban fringe is divided into three zones by Whitehand (1967) as the inner fringe belt (IFB), Middle fringe belt (MFB) and Outer fringe belt (OFB)<sup>7</sup>. He suggests that IFB surrounds the CBD (Central Business District). The adjacent build-up area is known as the MFB while the countryside villages with agricultural land would be OFB.

In the present study the fringe zone division as employed by M.M.P. Sinha (1974)<sup>8</sup> has been used. Thus the study villages lie in the suburban rural fringe (SRF), where the buildup area may be discontinuous, marketing facilities partially available in the area itself and the percentage of cultivable land relatively much higher. The major occupation of this belt is the production of goods in demand in the town. But there can be no physical discernible boundary between the SRF and UCF (Urban Suburban Fringe - an area just beyond the Municipal Corporation limit with a high value on the scale of urbanity), for, when the town extends the outer limit of the inner fringe usurps the outer fringe and the outer fringe encroaches upon the rural area, where there is no physical barrier.

## Relationship Between Urban Growth and Cropping Pattern Changes

The relationship between the city and the region (hinterland) is symbiotic - dependence of urban population on the surplus produce in agriculture of the rural hinterland, and the urban amenities and services in exchange to a large rural community. Thus there is mutual economic social and political dependence between the town and the countryside.

Rural-urban interaction - a two way process, arises and intensifies on account of such close relations. The city extends its sphere of influence or dominance on the countryside and the countryside reacts to this urban challenge through response in spatial, socio-economic and demographic aspects.<sup>9</sup>

In a primarily agricultural community, as Johnson<sup>10</sup> puts it, agriculture and trade in agricultural produce are the most important channels for accomplishing a rural-urban interaction. This leads to specialization of agriculture and trade where the products are mostly market oriented.

This specialization has been much noted in case of agriculture. The change from agricultural landuse to urban landuse obviously leads to scarcity of agricultural land which necessitates the efficient and judicious use of the available land and calls for better allocation of resource by the concerned farmer. However the decision of the farmer

to allocate more resources would depend much on the price expectations and the productivity of the substitute crops.<sup>11</sup>

Herein comes the significance of efficient cropping pattern. Cropping pattern, according to Muzid Hussain (1979)<sup>12</sup> implies the proportion of area under various crops at a point of time. The cropping pattern is the result of soil-climate conditions, technological factors, input-output of different crops and also socio-economic factors.<sup>13</sup>

The traditional cropping pattern was influenced more by the socio-cultural influents of which the consumption oriented economy of the people were important. But with urban growth and the dependence of the urban centres on the rural countryside for agricultural products, the cropping pattern as also the whole of agriculture was found to face changes. Firstly, the land becoming limited, and secondly, the urban demand for certain products compelled the cultivators to take up cultivation of only certain crops on a commercial basis and a change came over from consumption oriented production to market oriented production.

William Skinner's<sup>14</sup> view that rural-urban relationship is a link of the rural areas with urban economies through a series of market relationships, is an observed truth.

#### Review of Earlier Literature

Rural-urban interaction has been a much studied theme

and many national and global studies have been carried out in this field. It has its origin from the time of Von Thunen, Christaller and Perroux, when they, in their own ways, have tried to study the growth of urban centres. In fact, it can be said that these scholars have provided the bases for the later works done in this field. For example, Von Thunen's study of the relationship between primary agricultural production and markets working on the pattern of farming in West Germany and adjacent regions in early 19th century has provided important bases for rural-urban relationship studies.

More recently social scientists such as R.A. Ellefsen<sup>15</sup>, R.E. Dickinson<sup>16</sup>, Y.B. Damle<sup>17</sup>, Hemlate Acharya<sup>18</sup> and many others have dealt with this rural urban relationship and have made indepth studies in this direction.

R.E. Dickinson, in his book "City and Region" highlights the relevance of the geographical concept of the region and its hinterland. Here he has tried to explained the dependence of the city on its hinterland for its requirements of agricultural products, and the dependence of the hinterland on the city for the specialized services. He has tried to explain the consequence of urbanisation on the rural countryside.

The urban market oriented economy of the village life has been the object of study in Hemlata Acharya's

"Urbanizing Role of One Lakh City". C.D. Despande, A. Arunachalam and L.S. Bhat have analysed the dominant influence which the Bombay city has on the rural areas of South Kolaba in their works - "Impact of a Metropolitan City on the surrounding Region".<sup>19</sup> Kulkarni<sup>20</sup> and Despande<sup>21</sup> has also highlighted the probable phases of growth of an Indian suburb from a village.

The landuse changes in the fringe in favour of urban landuse etc. have been discussed by K.N. Gopi on his study of the fringe of Hyderabad<sup>22</sup>, and M.M.P. Sinha on the fringe of Patna<sup>23</sup>.

Studies have also been undertaken on changes in agricultural under urban influence. Worthy of mention is B.K. Sikka's and C.S. Vaidya's work on "Growth Rates and Cropping Pattern changes in Agriculture in Himachal Pradesh".<sup>24</sup> In this study, allocation of more land on urban demand substitute crops have been observed. It tries to assess the changes in area and productivity in agriculture as a result of this. "Impact of Urbanization on Capital Formation in Agriculture : A Micro level study in Ranchi, Bihar" by G.C. Srivastava<sup>25</sup> analyses the influence of urbanization on a regional farm economy.

### Objectives

The rural-urban interaction and particularly the relationship between urban growth and cropping pattern

changes in the fringe areas is the theme of this study. Thus in this study, an attempt has been made to understand the relationship which may also exist between the growth of Shillong and the cropping pattern changes in its fringe areas. The study, therefore, is undertaken with the following broad objectives -

1. To assess the pace and pattern of the city's growth
2. To assess the pace and pattern of changes in the cropping pattern in the fringe areas.
3. To examine the significance of different variables affecting the pattern.
4. In case of any significant changes not taking place in the pattern consequent of urban impact, the probable reasons behind it.

The degree of change in the cropping pattern, or agricultural landuse depends directly on the degree of urban expansion and urban demand for more and more of agricultural products. Hence, of the different variables affecting the cropping pattern, more attention has been given to -

1. Expansion of urban territory over surrounding areas.
2. The increase in urban demand for certain agricultural products consequent of increase in urban demand.

Besides these, change in cropping pattern in favour of improved varieties of crops to increase productivity

and thereby combat the problem of scarcity of agricultural land in the immediately surrounding areas of the city have also been examined.

### Source of Data and Methodology

Non-availability of reliable data pertaining to agriculture in these tribal regions is a basic handicap in research works. In an area where agriculture had been dominated by shifting cultivation, which still continues to be practiced at a lesser extent, these areas does not have any system of land record. Also records of operational attributes and of productivity is non-existent.

To solve this problem of paucity of data primary data have been obtained by using a comprehensive questionnaire prepared for the purpose. The questionnaire contains two sections - the first section pertaining to agriculture and the second, to the socio-economic interaction between the city and the rural areas.

Section one includes questions on the kinds of crops cultivated, area under them, as also to all the other operational and productional attributes at present and five and ten years back. It also includes questions on source of inputs, surplus and marketing of the surplus during the mentioned periods.

The second section includes questions pertaining to commuting - purpose, frequency, cost of commuting etc.

as also the number of commuters at present and ten years back. Thus the questionnaire covers a period of a decade i.e. 1975-85, which is the study period.

A sample questionnaire has been given in the Appendix.

Figures obtained, however, were in approximation, as the farmers were not able to give accurate figures regarding the above, particularly for the past years.

Data has also been collected from the respective Block Development Offices to supplement the primary information. Population figures for Shillong as also for the villages have been obtained from the Census Handbooks, Meghalaya.

Since the study is designed to measure the urban impact at varying distance, the two villages - Nongkrem Warbah and Umsemlem has been selected for the study on a purposive basis employing the distance concept as adopted by G.C. Srivastava in his study. Thus Nongkrem Warbah is nearer to Shillong, at a distance of 18 KM while Umsemlem is at a further distance, about 33 KMs, from Shillong.

For the study on cropping pattern changes, twenty cultivators each from both the villages have been selected on a quasi-random sample basis.

The intensity and real extent of commercial crop cultivation in the urban fringe is related to the response of the farmers to the city's demand. Since expenditure

reflects the demand pattern, hence in the absence of data on the city's demand pattern, it has been substituted by the city's expenditure pattern on the commercial crops (such as potato, vegetables, fruits etc), after taking into account the price factors. Hence, an index of expenditure with 1972-73 as the base year has been worked out, along with the price relatives for the same products for the same period.

The data for expenditure pattern employed has been for the years 1972-73, 1977-78 and 1983. They have been obtained from the N.S.S.O., while prices of the concerned products for the same years have been obtained from the price bulletin published by the office of the Directorate of Economics, Statistics and Evolution, Shillong.

Here, Income Elasticity of demand and variation in cost of production are not accounted for.

To analyse the change in the agricultural land use as that caused by urban influence, a comparative study has been made of the trend in expenditure and hence the demand pattern of the city and the trend in the change in area under commercial crops in the two villages during the decade under study.

Since an increase in population would obviously mean an increase in consumption and demand pattern, the city's demand has also been substituted by the population growth

# LOCATION OF STUDY AREAS

## EAST KHASI HILLS

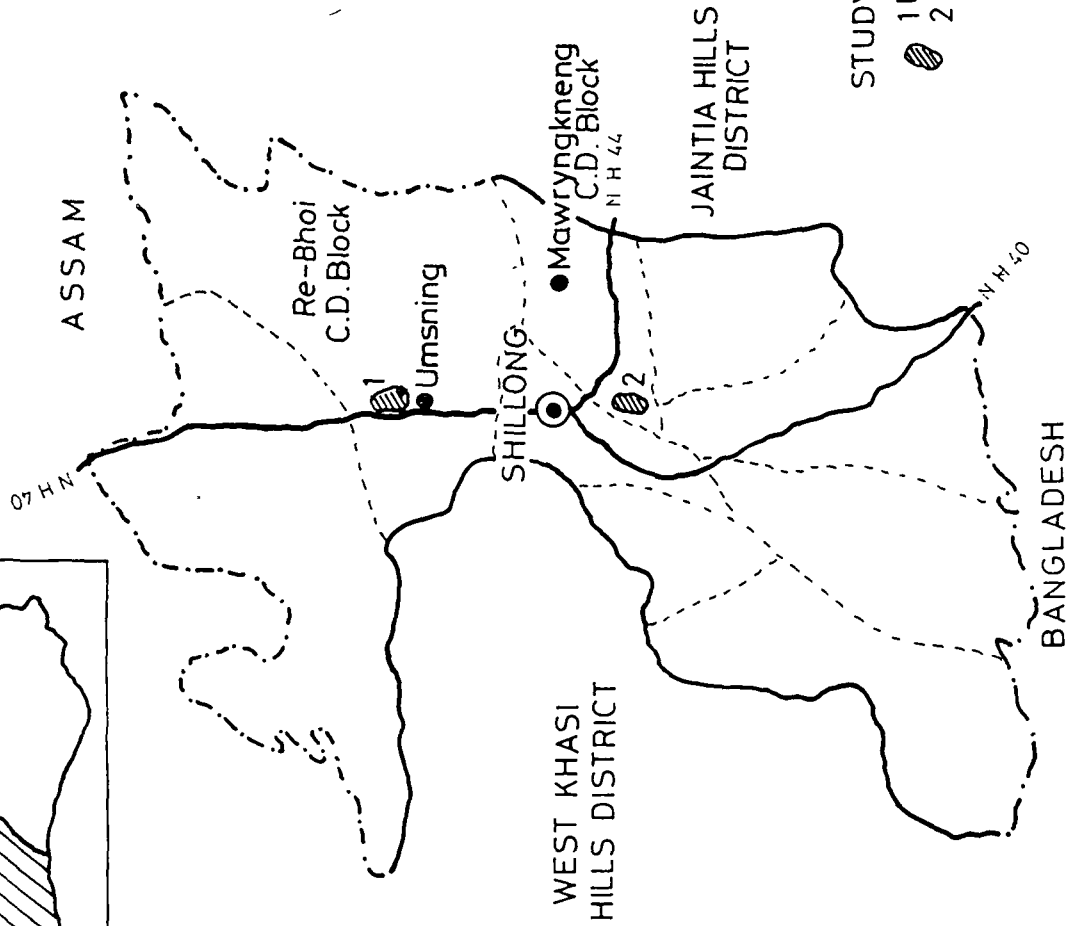
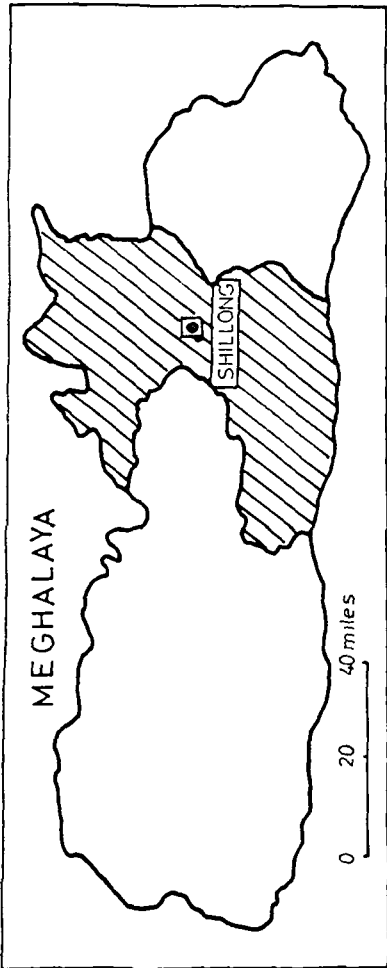


Fig 1

of the city to examine the increase in commercial cropped area consequent of this.

### Study Villages

#### Nongkrum Warbah:

Nongkrem Warbah, a hamlet of the village Nongkrem is situated at the heart of the village. Located at the south-western corner of the Mawrynkrong C.D. Block, it lies at a distance of 18 KMs from Shillong city and at about 9 KMs from the Shillong-Jowai National Highway and is linked by a metalled road which bifurcates from the National Highway. It covers an area of 2195 hectares supporting a total population of 2036 persons in 1981.

Physiographically, it is situated in the central high-land zone of the Shillong plateau. It consists of low plateau ridges which have large granitic rock outcrops. The village is situated at an elevation of above 1700 m above sea-level. The topography of the village is more rugged than the surrounding areas. This has posed difficulty in bringing more land under agricultural use.

The village falls in the region of sufficient rainfall with a moderate and somewhat humid climate though it is quite cold and frosty in winter. Temperature ranges from a minimum of 12°C to a maximum of 21°C. Hence the village falls within the central plateau agro-climatic zone favourable for the cultivation of a variety of potatoes

and English vegetables (cabbage, cauliflower, raddish, etc.) These vegetables are cultivated almost throughout the whole year. Cereal crops are of secondary importance.

The village has water-thin layer of soil. The texture of the soil material vary from big stones and gravels to very small and minute particles of sand, silt and clay. However, the soils of this particular village is mainly hill soil. In some part of the village, red loam soil is found with fine silt constituting the major fraction. They are also characterised by a very high organic matter and nitrogen content.

#### Landuse

Because of the hilly terrain, the village has limited land available for tillage. The village has a total area of 2195 hectares of which just 898 hectares or 40.91% is under cultivation. 27.19% of the total land is under unclassified forests while 31.89% is under non-agricultural use.

Of the agricultural landuse, 48.18% is under jhum lands while 27.98% of the total cultivated area is sown more than once. Landuse structure has been given in Table No.1 in Appendix.

#### Social Structure

The total population of Nongkrem Warbah, according to 1981 Census is 2036 persons with a sex ratio of .93.

Almost the entire population is tribal in nature comprising of the Khasis.

But of the total main workers which comprises of 43.95% of the total population of the hemlet, only 2.34% are cultivators with land while 37.4% are agricultural labours. Majority of the workers, i.e. 55.4% are employed in Government offices. This accompany the high literacy percentage - about 46.75% of the total population are literates. Occupational structure is given in Table No.2 in the appendix.

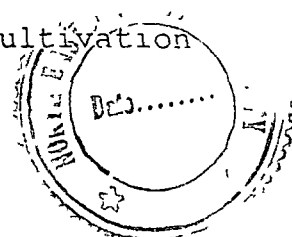
#### Umsemlem

Umsemlem village is situated at the southern part of the Bhoi Area C.D. Block of East Khasi Hills district, lying at a distance of 33 KMs from Shillong. Situated on the Shillong-Guwahati National Highway, it is well connected to the city. It covers an area of 297 hectares, supporting a total population of 272 persons.

Physiographically, the village is situated on the south-central part of the Northern undulating hills and thus have relatively level ground with gentle slopes. It is situated at an elevation of about 710 m above sea-level.

The village falls within the Northern Border Area agro-climatic zone which is a rainshadow area in the north of the Shillong plateau. But the subtropical climate along with the minor irrigation facilities favours the cultivation of paddy.

102411



The soil of the vilalge is predominantly red loam which are free from stone chips and gravels.

### Landuse

Umsemlem has a total area of 297 hectares of which 197 hectares or nearly 67% of the total area is under agricultural use (Table No.1 in the appendix). Only about 14.13% is under unclassified forests. About 10.11% of the total land is cultivable wasteland which could be brought under agricultural use after developing the land through provision of minor irrigation facilities levelling the land, etc. In fact, the village has potential for bringing more area under agriculture because of the relatively level ground and fertile soils.

### Social Structure

The total population of Umsemlem according to the 1989 Census of 272 persons with a sex ratio of 1.06. Almost the entire population is tribal in nature comprising of Khasis - more than 98.16% of the total population are Khasis.

The village is predominantly agrarian in nature indicated by the large percentage of agriculturists. Of the total main workers (124 persons) about 93% are agriculturists of which 90.3% own land. Only 8 workers are engaged in non-agricultural jobs (Table 2 in the appendix).

## Chapterization

It is essential here to outline briefly the chapters which follows. The first chapter has introduced one to the statement of the problem, the relationship between urban growth and expansion and landuse changes on the fringe and a brief review of the relevant literature available. It has also outlined the objectives, the source of data and the methodology of the study undertaken and has also introduced one to the study villages.

The fringe and all aspects within it changes with the subsequent growth and expansion of one urban centre. Hence the second chapter examines the growth of Shillong from the initial stage, when it was a small village in 1866, and its subsequent growth and expansion through acquisition of surrounding lands by the British, classification of the town areas into cantonment and municipality, and further expansion of urban agglomeration by incorporating the surrounding townships.

The surrounding rural areas of a town or city come under varying degree of urban influences according to such factors as location and transport facilities available. The third chapter, while making a general study of such factors in the Indian context, have tried to examine and analyse such factors and the consequent degree of influences of Shillong on its fringe areas or on areas of urban influence, and the resultant economic interaction.

The fourth chapter focusses mainly on the agricultural land use change and the resultant cropping pattern. Urban expansion brings about either a change from rural land use to urban land use or else a change within agricultural land use depending upon the farmers' response to city's demand pattern. On the fringe of Shillong, the latter case is more observable. This chapter deals in detail with this aspect.

The final chapter has summarized and concluded the findings of this study.

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CHAPTER - II

## URBANISATION OF SHILLONG

Urbanisation as a process leads to concentration of people in an urban place performing specialized functions. This concentration of population, as Smailes (1953)<sup>1</sup> puts it, leads to the growth of towns by the addition of new tissues, which implies that there is a constant influx of new territory within the urban compass. Thus with growth of urbanisation in India, new areas are constantly being engulfed into the urban landscape.

Though about 20% of the population of India lives in urban areas, the tempo of urban growth has accelerated during the last three decades. Prior to that the urbanisation process had been rather slow though it had accelerated decade by decade. At the turn of the century, urban growth rate had been very slow (0.4%) due mainly to an exodus of urban population to rural areas following the outbreak of plague in 1911<sup>2</sup>. But with growth of trade and industries, the following decades registered an increasing urban growth rate from 8.3% in 1921, 19% in 1931 to 32% in 1941-51.

From the decade 1951-61, rapid industrialization and urbanisation was registered with the establishment of new and/or improvement of industries<sup>3</sup>. This rapid industrialisation and urbanisation has resulted in extensive rural areas being engulfed into the urban landscape because of

spatial expansion of the urban centres.

### Urbanisation in Meghalaya

The pattern of urbanisation has been unique in the state. 18% of the total population comprising of urban population are concentrated in seven urban centres as per 1981 census.

Urbanisation in Meghalaya has not been a result of industrialization. Rather it has been due to development in trade and commerce. Initially the urban centres had developed as centres of administration, which still now remains the most important function of the urban centres.

Urbanisation has been noticeable in Meghalaya since 1961. A district trend can be seen from table-1.

- (1) A very fast rate of growth in 1961 with a marked increase in decennial period between 1941-51 to 1951-61 from 53% to 100%.
- (2) A less rapid rate of growth of Urban population in 1961-71 contrary to the rest of the country where a rapid rate of urbanisation was registered
- (3) A very rapid rate of urbanisation in 1971-81.

A high rate of migration has played an important role in heightening the proportion of urban population. Though no new town had come up during 1951-61 and all the urban population was concentrated in the three towns of the state, yet urban population increased due to large number of immi-

Table 1: Variation of Population in Meghalaya

Year	Total population	Urban population	% Urban Population to total population	% Increase of Urban Population (Decadal)
1901	3,40,424	9,621	2.82	-
1911	3,94,005	13,639	3.46	+ 41.76
1921	4,22,403	17,203	4.07	+ 26.13
1931	4,80,837	26,536	5.51	+ 54.25
1941	5,55,820	38,192	6.87	+ 43.93
1951	6,05,674	58,512	9.66	+ 53.20
1961	7,69,380	1,17,483	15.26	+100.78
1971	10,11,699	1,47,170	14.55	+ 25.27
1981	13,38,819	2,39,501	18.00	+ 62.74

Source: Town Planning Office.

gration which were of three types - (1) migration from the neighbouring states such as Assam, Bihar, West Bengal seeking tertiary jobs; (2) migration from outside the country, i.e. from Nepal and Bangladesh; (3) migration from rural areas within the state.<sup>4</sup>

The contrasting lesser rate of urban growth during 1961-71, a growth rate of only 25.26% can be very well explained by the separation of Meghalaya from Assam and consequent shift of capital of Assam from Shillong to Dispur in 1971. The obvious result was the out-migration of a large number of people from Shillong. Also, according to Mrs. P. Chittaranjan's observations the large scale movement of troop units out of Shillong to the Himalayan border areas during the Chinese Aggression in 1962 also lead to decrease

in urban population<sup>5</sup>.

The high rate of growth of urban population in Meghalaya during 1971-81, in fact the highest in the North-Eastern region a growth rate of 62.74% against the all India figure of 46%. The coming up of new towns were solely responsible for this high growth rate. The state had only 6 towns upto 1961-71, i.e. (1) Shillong municipality, (2) Shillong Cantonment, (3) Mawlai, (4) Nongthymmai, (5) Jowai and (6) Tura.<sup>6</sup>

In 1981 Census, the following towns were added - (1) Madanrting, (2) Pynthorumkhrah, (3) Cherrapunjee, (4) Nongstoin, (5) Williamnagar and (6) Baghmara. This increased the number of towns to twelve. Of these only the Shillong Urban Agglomeration comprising of Shillong Municipality, Nongthymmai, Mawlai, Shillong Cantonment, Pynthorumkhrah and Madanrting is a Class I city with a total population of 1,73,064 persons. The other towns are of the following class - Class III - Tura (35,131) Class IV - Jowai (12,908), Class V - Cherrapunjee (6104), Class VI - Williamnagar (4290), Baghmara (4128), Nongstoin (3876)<sup>7</sup>.

The growth rate of these towns is given in Table 2.

Although the growth of urban population has been quite fast in Meghalaya, other attendant problems of urban growth have not shown their ugly heads, except in Shillong Urban Agglomeration where symptoms of the problems has started showing up<sup>8</sup>.

Table 2: Population and Growth Rate of Cities, Urban Agglomeration and Towns in Meghalaya

Sl No	Size/Class/City/U./A/Town	Population 1981		Growth Rate		
		Persons		1961-71	1971-81	
		3	4	5	6	
1.	All Classes	2,38,501	1,25,885	1,13,616	+25.27	+62.74
2.	Class I	1,73,064	90,978	82,086	+19.88	+40.99
	Shillong U.A.	1,73,064	90,978	82,086	+19.88	+40.99
	Shillong Municipality	1,07,673	56,382	51,291	+21.01	+22.83
	Nongthymmai	21,563	11,275	10,288	+59.69	+33.91
	Mawlai	20,280	10,641	9,639	+67.21	+42.22
	<u>Pynthor Umkhrah</u>	10,735	5,748	4,987	..	..
	Shillong Cantonment	6,653	3,774	2,879	+58.32	+40.66
	<u>Madanrtng</u>	6,160	3,158	3,002	..	..
3.	Class II	..	..	..	..	..
4.	Class III	35,131	18,648	16,483	+74.27	+126.81
	Tura	35,131	18,648	16,483	+74.27	+126.81
5.	Class IV	12,908	6,479	6,429	+44.09	+44.56
	Jowai	12,908	6,479	6,429	+44.09	+44.56
6.	Class V	6,104	3,071	3,033	..	..
	Cherrapunjee	6,104	3,071	3,033	..	..
7.	Class VI	12,294	6,709	5,585	..	..
	<u>Williamnagar</u>	4,290	2,421	1,869	..	..
	<u>Bagmara</u>	4,128	2,128	2,000	..	..
	<u>Mongstoin</u>	3,876	2,160	1,716	..	..

Note: Towns treated as such for the first time in 1981, are shown with underline

Source: Census of India, 1981.

It is anticipated that in near future the other towns will also grow very rapidly, the numerous sub-divisional headquarters which are rural at present are also likely to become urban centres. ✓ Thus as a measure for checking unprecedented growth of urban population of the larger towns these new towns and towns-to-be need investment on urban development schemes to check the influx of population to larger towns.

Here a close examination of the varying stages in the urban development and growth of Shillong is felt necessary.

#### Origin and Growth of Shillong

Urbanisation of Meghalaya as in the rest of the north-east, mostly followed the path of extensive administrative frontier. Shillong urban area which was established with this objective, grew from a small village in 1866 to a cosmopolitan city in the recent decade<sup>9</sup>, contributing a large portion of the urban population to the total urban population of Meghalaya consisting of Shillong Municipality, Shillong Cantonment, Madanrting and Pynthorumkhrah, the Shillong Urban Agglomeration accounts for over 72% of the total urban population of the state.

Urban Shillong came into being due to the need for a centrally and stratifically located station from where

the surrounding rebellions hills areas could be brought under urban control. In fact the origin of Shillong could be said, according to C.I. Dkhar<sup>10</sup>, to have been closely connected to the outbreak of the rebellion in the Jaintia Hills. Prior to this the administrative and military seat of the British in Meghalaya was set up in Nongkhlaw which was set up after the Khasi rebellion. But soon after, it was shifted to Cherra from where also a change of site was felt necessary and thus Shillong was selected with the joint approval of Brigadier G. Showers (the then Special Commissioner of Khasi and Jaintia Hills), Lt. Governor of Bengal and Col. Henry Hopkins, Commissioner of Assam, of which arrangements for acquisition of territorial rights over the chosen area from the respective 'Syiems' or chiefs were made<sup>11</sup>. On December 8, 1863, the raj rights and title deeds over raid lands south of Umshirpi known as Kurkynton Nongkseh lands and the Shillong Laban lands passed over to the British<sup>12</sup>. the details of legal procedure of which need not be studied in this chapter.

In 1864, a civil station was established in the acquired land and 2 years later Shillong was proclaimed the Headquarter of the Khasi and Jaintia Hills district<sup>13</sup>.

The reason for selection of Shillong were firstly centrality to all boundary, secondly future connection of the station with other parts of the north-eastern frontier with one road leading down to Gauhati and other via

Cherrapunjee to East Bengal and thirdly, nearness to Calcutta via Cherrapunjee road, and fourthly, easy availability of building materials.<sup>14</sup> Also, Shillong situated between latitude  $25^{\circ}5'N$  and longitude  $91^{\circ}9'E$  and at an altitude of 1524 m. above sea level has cool and congenial weather suitable to the Europeans, besides the less amount of rainfall compared to Cherra.

The area covered the base of the Shillong Peak, skirting Sadew Village, Nongkseh Village, Mawkhar Village, Laban Village, Laitumkhrah and then back to the base of Shillong Peak<sup>15</sup>.

The British, over the years, also acquired large pieces of land adjoining the ceded territory. Some of these plots are Bremer estate inside the cantonment area, parts of Laitumkhrah, Pasteur Institute, Lower Lachumiere, Kench's Trace, etc.<sup>16</sup> There are also land falling within the cantonment area which were never ceded or acquired but absorbed by invoking clause 6 of the 1875 annals by the British.

The ceded territory was gradually classified into cantonment lands and normal area while the acquired areas passed into the twilight zone with the British Government recognising them as part of Myllem state but virtually exercising sovereign right.

The boundaries of Shillong station were notified in 1896. In 1904, the town was divided into five wards. Nearly

# SHILLONG TOWN ( 1914 )

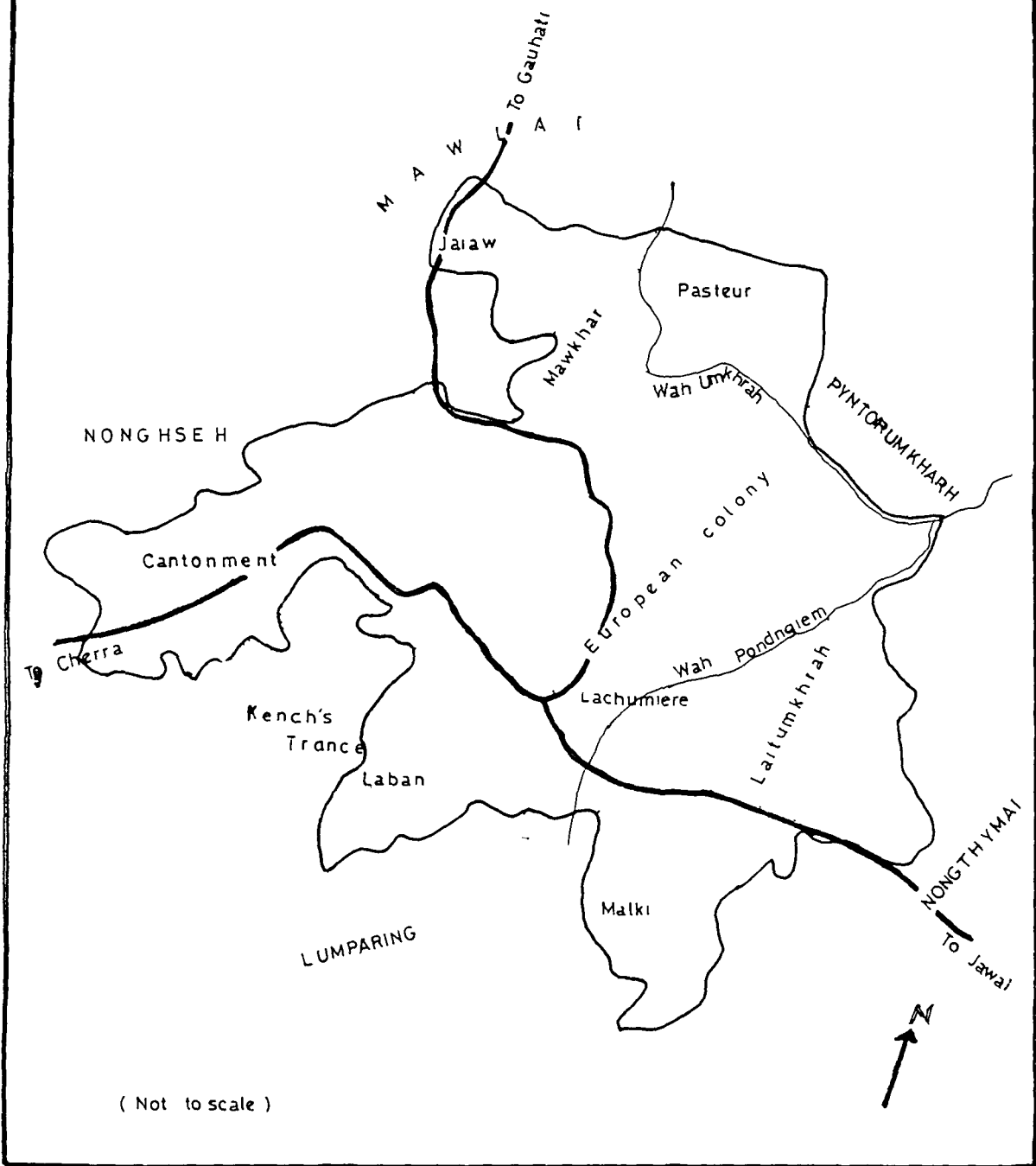


Fig 2

five years' efforts to convert the station into a Municipality finally materialized on 15th August, 1910 when the station was converted into a Municipality with altogether ten wards. This boundary was revised on 23rd October 1914. The new boundary of the Shillong Municipality was fixed as follows:-

East: Village Laitumkhrach

West: Cantonment and village Mawkhar

South: Village Malki, Government forest and village Laban.

North: The Umkhrach river from its junction with the Pandugiem stream, down the polo bridge and in a straight line to a pillar in the north of Haveng Umkhrach and then to another straight line to a point in the Umkhrach river where the path from Mawkhar to Mawlai crosses it.

(Fig.2.)

Urbanisation of Shillong has been progressive. From a small village in 1866 to every stage and class of township and in 1981, with a total population of 173064 persons is a class I city, according to the census definition of 1971-81. At its infant stage, in 1872 it had a total population of just 1363 persons according to the Bengal census. But with increasing population and amalgamation of surrounding villages into it, it has from a class V town in 1901 grown to class IV in 1911-12, class III in 1931-41 and Class I in 1951-71 to class I in 1981. Here it becomes necessary to study the population growth of the city at every stage of urbanisation.

Since many of the towns were included in the Shillong Urban Agglomeration during 1961-81 our study will have to be for that period.

In 1961, Shillong comprised of the Shillong Municipality, Cantonment, Nongthymmai and Mawlai and all together had a growth rate of only 19.88%. But if we examine the figures given in table 2, we find that Shillong Municipality was responsible for this low figure, as the rest had quite high growth rates. Nongthymmai had a growth rate of 59.60%, Cantonment 58.32%, and Mawlai 67.21% which is moderately high urban growth rate. The reasons given for this by Mr. T. Cajee<sup>18</sup>, and which is also quite obvious, is the exodus of government employee and family following shift of most administrative offices to Dispur from the Shillong Municipality.

The overall growth rate of urban population was very high in 1971-81. This can be attributed to (1) Addition of Pynthorumkhrah and Madanrting town to the urban agglomeration, (2) immigration from surrounding rural areas as also interstate immigration, (3) change in Municipality boundary.

If we exclude the population figures of Pynthorumkhrah and Madanrting which is 10,735 and 6,160 persons, respectively, the urban growth rate of Shillong urban agglomeration remains 28.9% instead of 43.70% in 1971. Thus this near

stagnation of growth in the four towns (Municipality, Cantonment, Nongthymmai, Mawlai) is due to (i) the outmigration of the Assamese population which had still continued since the separation of Meghalaya from Assam in 1971, (ii) physical extension into hinterland which do not clearly figure in the census enumeration<sup>19</sup>.

A major share of the urban population of Meghalaya is concentrated in Shillong Urban Agglomeration, of the total urban population of Meghalaya (18.12% as against 23.73% of National average), Shillong Municipality alone has 48.71% of urban population, thus showing a very high density of population - 10,500 persons/sq.km.

#### **Growth of Shillong : Spatial**

From a small village in 1888, Shillong has grown into a cosmopolitan city in the recent decade. The different stages by which Shillong grew spatially can be studied as follows:

- (1) Shillong town initially covered the base of Shillong Peak skirting villages Sadew, Nongkseh Mawkhar, Laban, Laitumkhrah and back to the base of Shillong.
- (2) Over the following years, the town expanded with the British acquiring large pieces of land adjoining the town. These included Bremer Estate (inside Cantonment), parts of Laitumkhrah Pastuer Institute, Lower Lachumiere, Kenche's Trace, etc.

# SHILLONG STANDARD URBAN AREA 1971

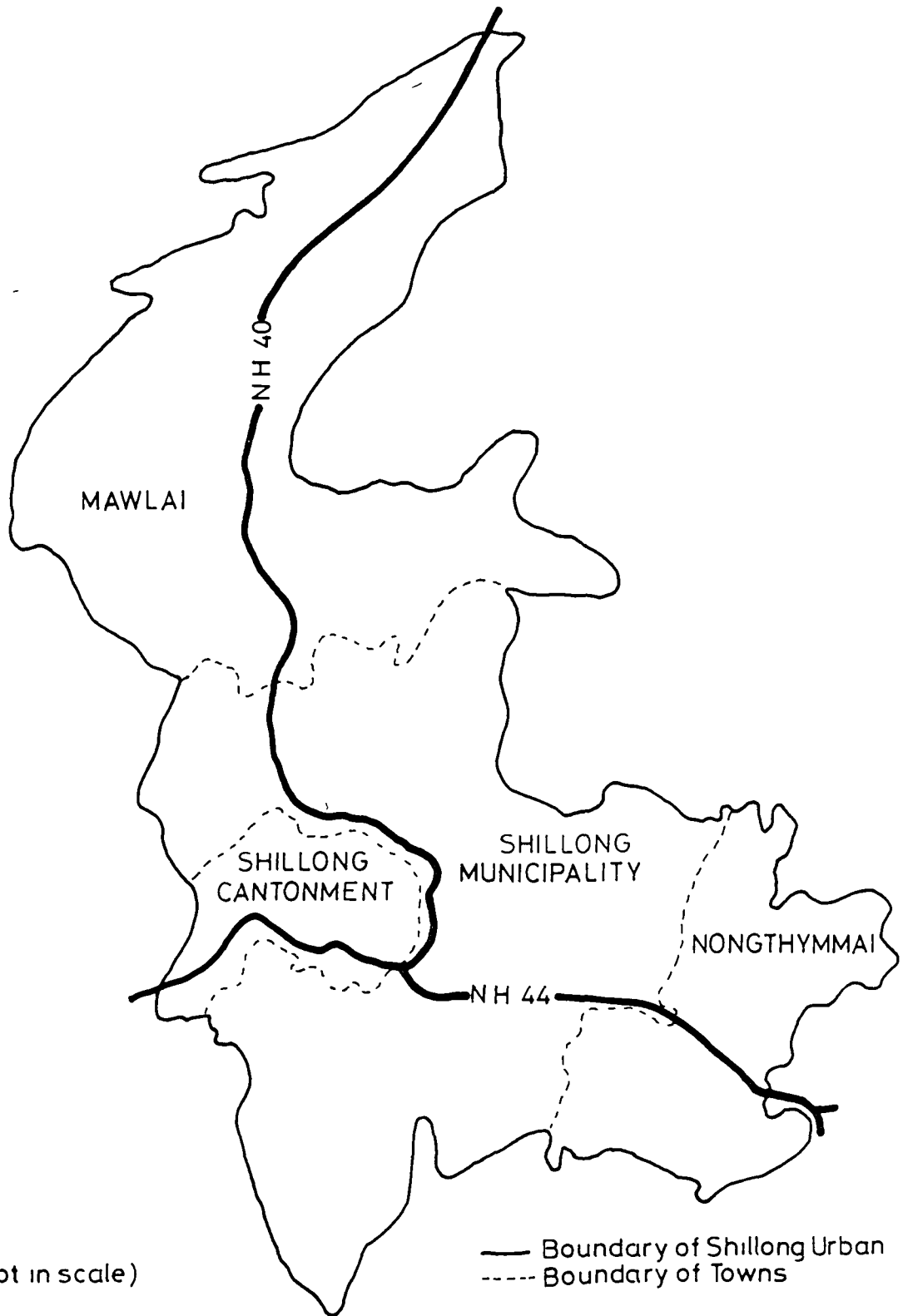


Fig 3

- (3) By 1901, the town had amalgamated within its fold the outlying villages of Laitumkhrah, Mawkhar and Jaiaw.
- (4) The ceded as well as the acquired territories were classified into Cantonment and Government lands. These 1931 Shillong comprised of Shillong Cantonment and Municipality.
- (5) By 1961, the adjoining townships of Mawlai and Nongthymmai was added to the urban territory (Fig. 3).
- (6) Shillong urban territory expanded further in 1981 by the addition of Pynthorumkrah and Madanrting. Hence in 1981 Shillong Urban agglomeration comprised of 7 townships of Shillong Municipality, Shillong Cantonment, Mawlai, Nongthymmai, Pynthoumkrah and Madanrting (Fig.4).

If we look at the areawise expansion, we find that before the inclusion of any of the four later townships (viz. Mawlai, Nongthymmai, Pynthorumkrah and Madanrting), the Shillong urban territory which comprised only of the Municipality and cantonment, had a total area of 12.2 sq.km. supporting a population of 58,512 persons according to 1951 census.

With the inclusion of Mawlai and Nongthymmai which had areas of 6.14 sq.km. and 2.93 sq.km each respectively, the total area of the Shillong Urban territory increased to 21.27 sq.km. supporting a population of 1,02,398 persons. Thus the increase in area was by about 42.64% and population

was by about 42.85 against that of 1951 figures.

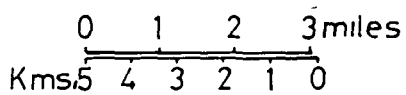
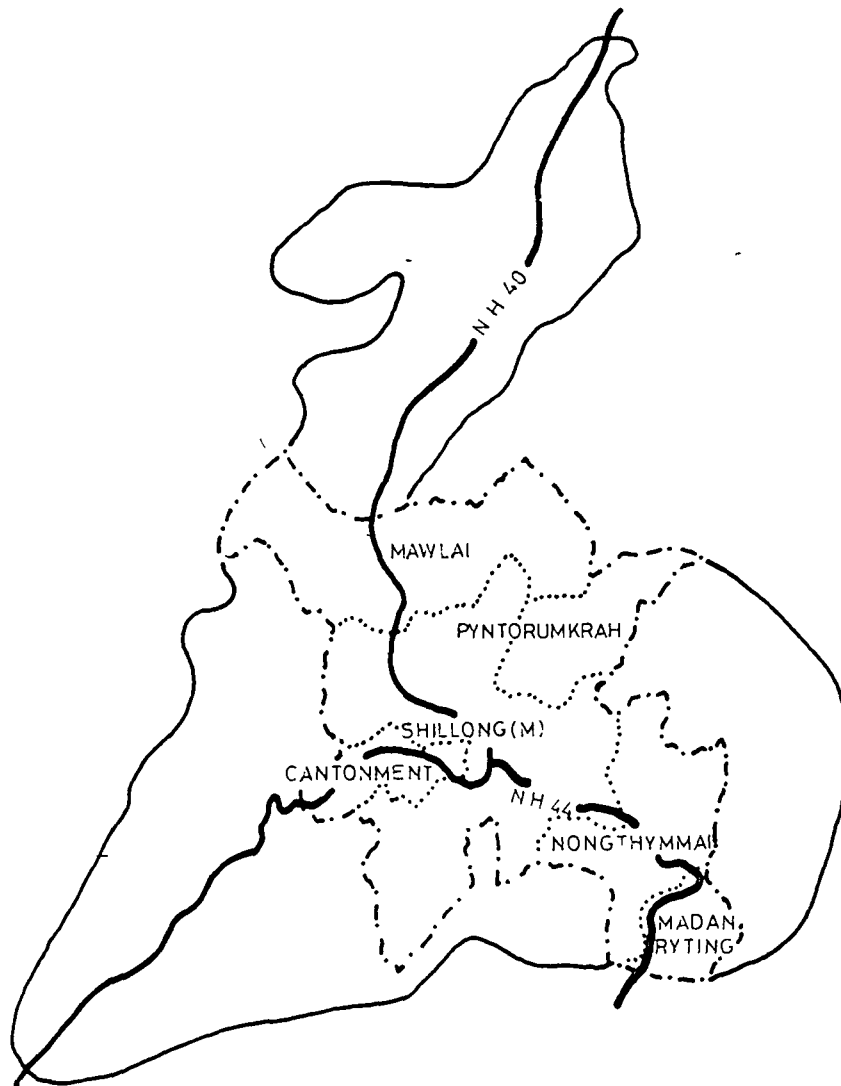
There was no marked increase in area under the urban territory with no new village or township being included in 1971 but population on the other hand increased by 19.87% over the preceding decades.

With the inclusion of Pynthormukrah (area - 2.02 sq.km) and Madanrting (area - 2.11 sq.km) in the Shillong urban agglomeration in 1981, the total area of the agglomeration increased by 19.41% over those of 1961 while population increased by 70.61% during the same period.

From the above, it is clear that expansion of Shillong's urban territory have not been very rapid as compared to that of population expansion. The ratio of increase in urban area to that of urban population of Shillong which was 1:1.21 in 1961, 0:2 in 1971 and 1:23.9 in 1981 a very rapid increase in population as compared to the increase in area.

Though the rate of increase in urban area has been very slow, yet it has been a continuous-process. Already villages such as Mawpat, Mawtawar, Mawshbuit, etc. have already been engulfed within the fringe of the urban agglomeration (Fig.4). In this continuous process of fringe development, outlying villages like Laitkor, Mawkynroh, Mawphlang and Upper Shillong, which are now urbanised villages would be engulfed in the near future.

# SHILLONG STANDARD URBAN AREA 1981



- Boundary of S.U.A.
- - - Boundary of Shillong U. Agg.
- ..... Boundary of Towns

Fig. 4

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CHAPTER - III

## URBAN INFLUENCES

A city, in its urbanisation process, not only bring a change along its fringe itself but also in the areas away from the fringe. While the impact of the city is distinctly visible in the landuse, landvalues, density of population, non-agricultural working population utility services, primary activities, medical facilities etc.<sup>1</sup> in the fringe zone, urban impact is also visible in the agricultural landuse, agricultural practice as also non agricultural working population, and medical facilities, etc. to a certain extent in the rural areas away from the fringe. The degree of the impact of different factors decreases with increase in distance/time from the city.

Studies on these urban influences has brought out the greater significance of certain influences over others. They are :

- 1) Location,
- 2) Transportation,
- 3) Recreation
- 4) Medical.<sup>2</sup>

The locational influence results in a direct rise in landuse intensity, landvalue, population density, percentage of non-agricultural workers and landuse changes as we approach the city. The transportation influence have

extended the fringe limits in particular direction. Recreation guides the number and direction of daily commuters. The institutional influences are connected with the impact of educational and legal institution on the fringe. The impact of medical services is also no less significant.<sup>3</sup>

No doubt all the above factors have an important role to play in making the urban impact felt, but in the present study limited to the change in cropping pattern in the fringe area more importance is given to the first two factors namely locational, and transportational. This chapter thus deals in detail with these two factors.

#### Influence of Shillong

Shillong's area expansion is not radial, i.e. not necessarily circular, but sectoral depending upon the pattern of transport routes. Thus the transport has had an important role in bringing about a rural-urban interaction between Shillong and its rural fringe.

But transport is not the only important element, the distance of the rural units, and hence the time taken to travel between the rural units and Shillong has been found to be of greater importance. Hence the locational influence has much importance in bringing about a relationship between the rural units and Shillong.

### Locational Influence

Location is a relative term which is closely associated with time and distance. The two terms are controlled by accessibility.

Studies undertaken in the fringe of certain cities in the country reveal that relatively with decrease in accessibility, the urban influence decreases. The villages nearer to cities exhibit a more urbanised way of life and urban characteristics. "The intensive use of land, small farms, high priced land, dense population and almost daily contact with the city in marketing their crops means a way of life for the farmer intermediate between that of the city dweller and the general farmer."<sup>4</sup>

Nongkrem, situated at a distance of 18 kms. from Shillong and being at a higher altitude because of which travel time is less from the village to the city (due to the descend) puts Nongkrem at a favourable location. And here the locational influence is more than in Umsemlem, which besides being situated at a distance of 33 kms is at a lower altitude taking more travel time. This can be seen from the break-up the locational influence.

The locational influence of a city has been visualised in the form of

- 1) Intensive landuse and small farms
- 2) High priced land
- 3) Dense population

- 4) Non agricultural workers, and
- 5) Trend of landuse changes.<sup>5</sup>

### Intensive Landuse

Studies of landuse pattern of the fringe show distinct changes taking place over the years which follows a short of Von Thunen landuse pattern where landuse is influenced by location which is controlled by transport and communication.

Agricultural land near town is not left fallow even for a day, specially those villages where irrigation facilities are available as for example the fringe areas of Patna.<sup>6</sup> Fringe areas of Hyderabad, provided with irrigation facilities, produce agricultural goods for the urban market.<sup>7</sup> Here the current fallow land decreased by 87.06% from 1971 to 1981. This is an indicator of the more intensive use of land.

Not only this, but with decrease in agricultural land, the total cropped land has become almost double due to double and multiple cropping.

In Nongkrem, land is used more intensively at present than it was a decade back, as can be seen from the following table. The current fallow land has declined from 113 hectares in 1975-76 to just 75 hectares in 1985-86. The decline is of about 39.83% over the last decade. However, significant

decline in cultivable wasteland has not been noticed.

Table 3: Landuse Intensity

Village	Year	Current Fallow	Cultivable wasteland
Nongkrem	1975-76	123	87
	1985-86	74	79
Umsemlem	1975-76	24	56
	1985-86	8	30

Source: Block Development Offices, Mawrykneng & Bhoi Area.

In Umsemlem, the current fallow has declined from 24 hectares to just 7 hectares in the mentioned decade - a decline of 70.83% with land development efforts of Block Development office, also much of the uncultivable land has been brought to use.

#### Non-Agricultural Workers

The influence of a dynamic and expanding city in the economy of fringe community is multiple. The opportunity of non-farm employment is one among them. The rural population pushes into town in search of employment. The pull factor of the city has a more significant role here than the push factor of the rural area.

The agricultural labour of the fringe area change their profession and switch over to non-agricultural occupation. Not only that, some members of the cultivator household also take up urban employment to supplement household

income as was noted in case of fringe areas of Hyderabad city.<sup>8</sup>

The shift to non-agricultural jobs in these fringe belt could only be explained by the urban influence. On the one hand, the urban area expansion leading to change in agricultural land into urban land and hence less agricultural jobs available. On the other hand, the increased job opportunities in the city acts as an attraction to the already unemployed labours.

Non-farm employment opportunities while having a positive effect on the local economy in the form of additional scope of the productive use of surplus farm population in the urban employment, also have negative effect in the form of loss of farm labour and increased wages. This is a serious setback to farming in the fringe areas, more so because of the inherently weak competitive capacity of the farm employment to urban employment opportunities. The frequently sought solution for this is the adoption of labour saving devices which may lead to intensive cash crop farming with intensive capital input in the fringe areas.<sup>9</sup>

This seems to be an emergent feature in agricultural activities of the fringe areas of the cities in the country where such studies have been conducted.

On the fringe of Shillong, particularly in Nongkrem, according to the 1981 census, the total number of non-agri-

cultural workers was 55.53% while in 1971, it was just 11.32%. The number of workers employed in the city amounts to 30% in 1981 while a decade back it was just 5% (according to the village headman). These workers are mostly employed in government offices as clerks etc., while the remaining are employed in household small scale industries.

While the number of non-agricultural workers have increased over the decade we find that the number of cultivators have declined from 173 to just 21 cultivators, while the number of agricultural labours increased marginally by 7.03% (Table 4).

Table 4: Occupational Structure (1971-81)

Village	Year	Total workers	Culti-vators	Agri. labours	Household	Other workers
Nongkrem	1971	565	173	313	14	64
Warbah	1981	895	21	335	43	496
Umsemlem	1971	46	46	-	-	-
	1981	124	112	4	-	8

Source: Census of Meghalaya, 1981.

The occupational structure of Umsemlem show the dominance of agriculture as the main occupation. There has been no change in the occupation pattern over the decade. In 1971 the entire work force were cultivators. In 1981 also almost the entire working population was engaged in agriculture. Just 8 workers are employed in other jobs such as

## OCCUPATIONAL STRUCTURE Nongkrem.

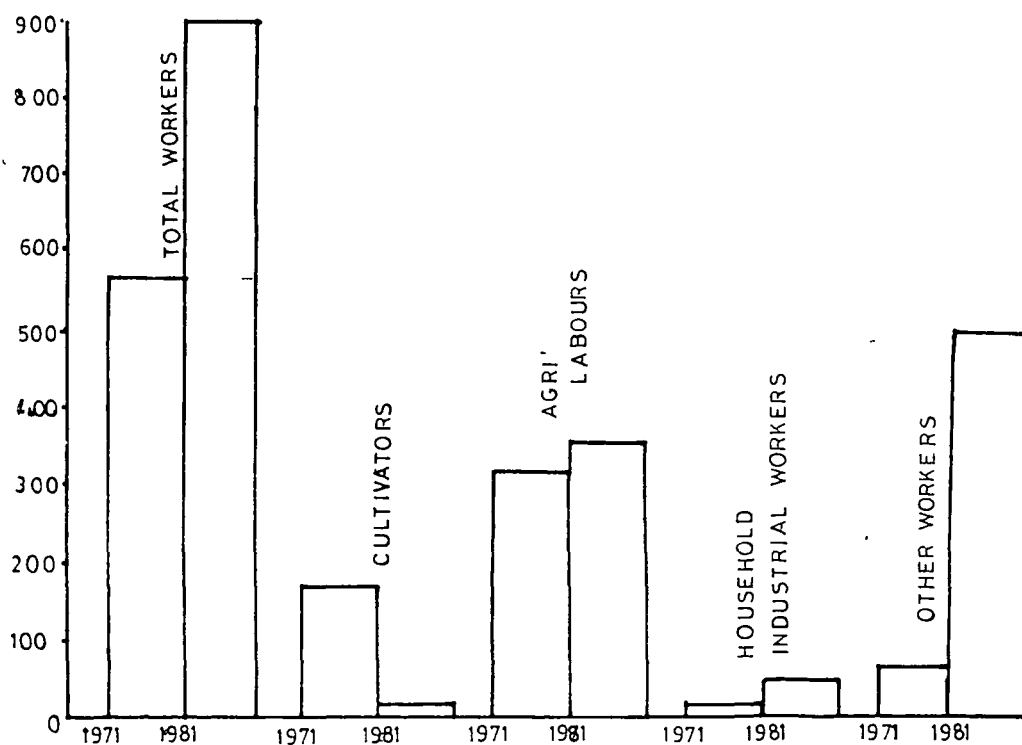


FIG 5

## Umsemlem.

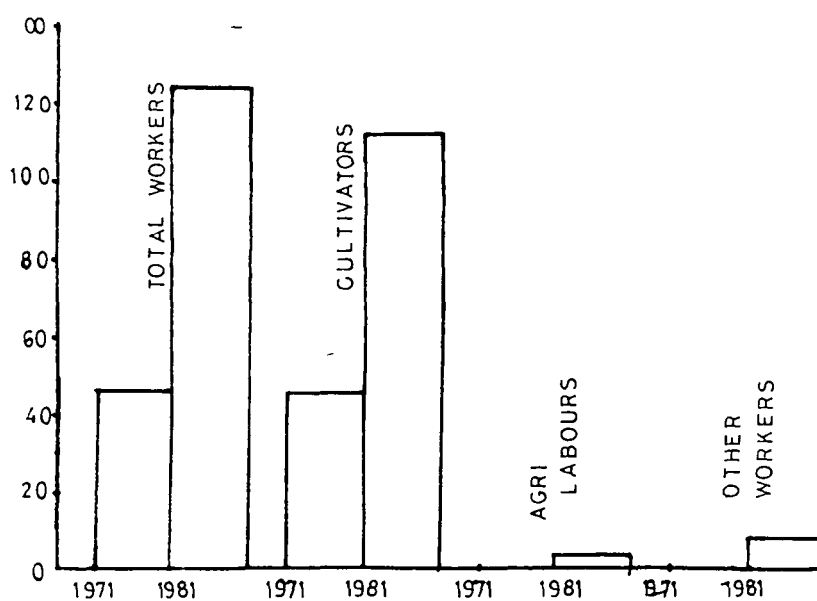


FIG 6

government offices in Umsning.

Though there is no statistical record, but informations from the village headman who also happens to be the most reliable source particularly in tribal areas, in the absence of statistical recording, it has been found that an increasing number of agricultural workers are employed during the sowing and harvesting seasons which was not the case 10-15 years back. These labourers come from villages as far as 3 kms and thus do not stay in Nongkrem but go back everyday after their work. A question arises here as to why these labourers are employed from outside the village? The answer to this was, that over the years, less and less labourers became available within the village as they switched over to jobs such as in household industries established in the village as also take up such jobs in the city which require minimal of skills.

### Landuse Changes

The fringe belt is marked by a changed landuse pattern firstly from that of agricultural landuse to urban landuse, and secondly from agricultural landuse for dominantly traditional crops to landuse for urban market oriented cash crops.

The landowners of the fringe areas use their land for maximum profit as suggested in Von Thunen's 'Isolated State'. Nearer to the city, they sell their land for house construction while further away the land is devoted to cash

crop farming. Besides them, the city development authority and Cooperative Housing Societies, etc. as also many other Government Agencies acquire land for the construction of government quarters, etc.

In the fringe of Jaipur, at different instances, agricultural land was converted to residential use. In 1974, 62.5 acres, 1975 21.9 acres, and 13.1 acres in 1979.<sup>10</sup> Many housing colonies have come up in the recent decade on the agricultural land of the fringe of Kanpur, Lucknow, Meerut, etc. As much as 5200 acres of agricultural land was acquired by the Meerut Development Authority in 1987.<sup>11</sup>

Further away from the immediate fringe, the land use change has been more from that of food crop land use, to cash crop land use. Studies of fringe revealed that the cultivators are growing vegetables and fruits while earlier they used to raise maize, bajra, etc. In the fringe of Bombay, the villages near to the metropolis agricultural land is devoted exclusively to non-food crops. While further away food crops still dominate the area coverage.<sup>12</sup>

The change in land use pattern which Nongkrem on the fringe of Shillong, is facing is not that of agricultural land use to urban land use as yet, but from that of food crop land to cash-crop land as is evident from table 5. But in case of Umsemlem, food crops still continue to cover a large cultivable land. There has been no significant change in the village in this respect.

The pattern of agricultural landuse change would be discussed in much detail in the following chapter.

### Transportational Influences

The transportational system of a town provides facilities for the movement of the fringe dwelling workers to and from the city daily. Daily commuters increase with increase in means of urban transportation. Therefore where roads and rail-links are absent there the fringe is narrow while the fringe belt bulges out along the transport lines.<sup>13</sup>

Metropolitan cities have fast suburbs rail services for its suburbs such as in Bombay, Madras, Delhi, etc. Along these fast rail services and along the roadways, influence of the cities are much evident. These transportational facilities has led not only to industrial spill over, but a change in agriculture, particularly in agriculturally productive areas such as the coastal strip along the western railway in the fringe of Bombay, which have changed from subsistence agriculture to a market oriented economy.

The fast transportational facilities have given a high degree of personal mobility and led to a complex network of journeys to and from the city. But it can be observable that urban influence extends as a corridor possibly not beyond 10-20 kms in width away from the transportation lines, penetrating deeper into rural area along them.

### TRAFFIC FLOW-Shillong

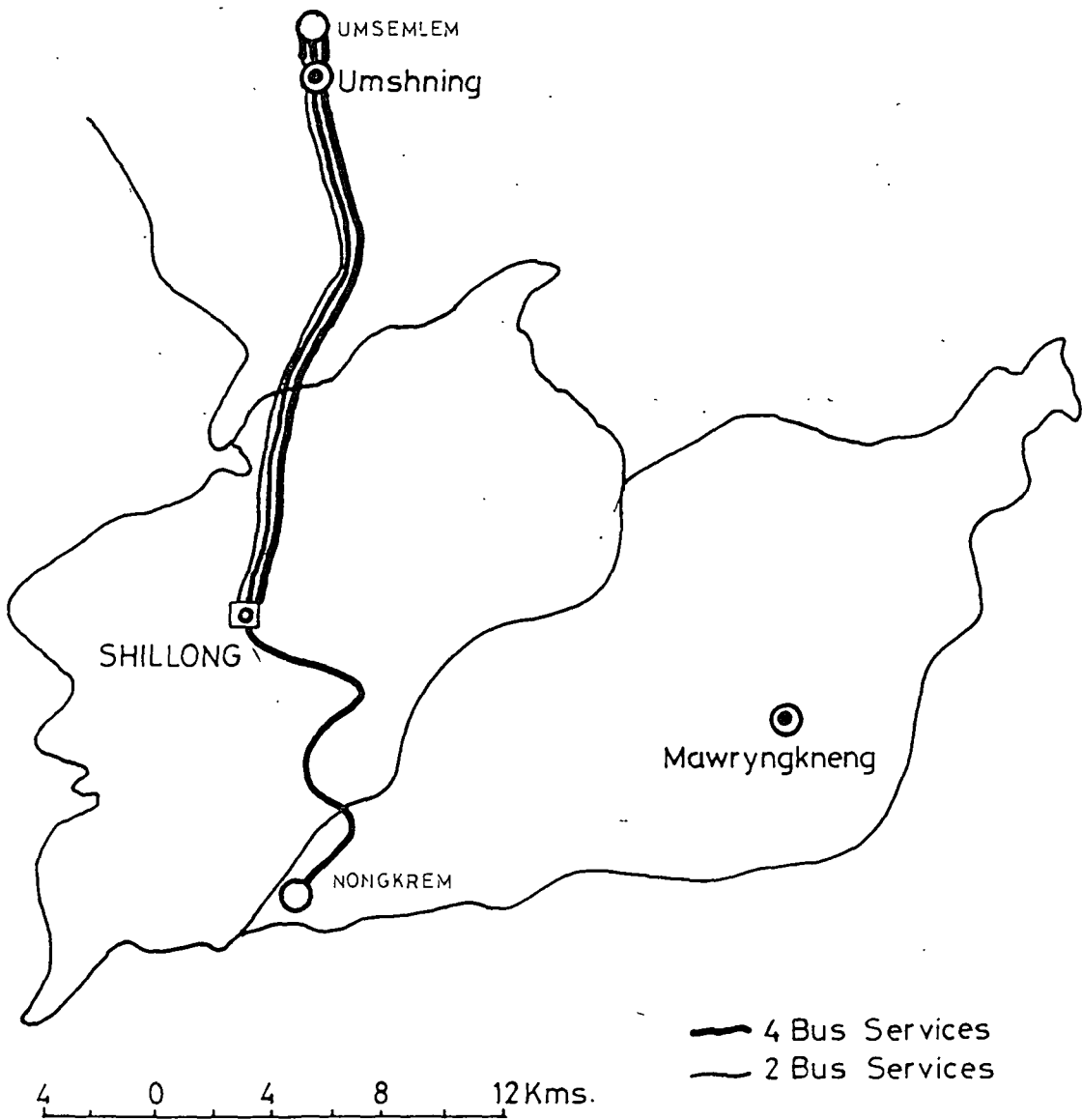


Fig. 7.

Outside this limit of commuting and quick access to city lies in tribal and underdeveloped rural areas. The sectoral spatial expansion of Shillong along the transport arteries reflects importance of transport as an influencing factor. The fringe belt has bulged out along the three main roadways (Shillong-Guwahati, Shillong-Cherrapunjee, and Shillong-Jowai), while the belt is narrow in other parts. (Fig. 4).

Nongkrem Warbah is well linked to Shillong by a metalled road which bifurcates from the Shillong-Jowai National Highway. City bus services are available twice a day upto the village while state transport bus is available once a day. Besides these, many of the villagers own private means of transport. Also, daily commuting is made easy by the nearness of Smith village where hourly bus service is available to Shillong. The time taken in commuting to the city from the village is about 45 minutes. Fig. 7 shows the frequency of bus services from Shillong to the village.

The relatively less time taken in commuting and the availability of means of transport has led to an increasing number of workers commuting daily to the city. More than 30% of the villagers are job holders against only 10% in 1971. Besides, the daily commuters working in Shillong, villagers also commute to Shillong for other purposes such as purchase of consumer goods like cloths, for medical facilities as also for buying agricultural inputs, though they

do not commute daily.

The number of commuters increase during the post harvest periods of potato crop. Thus during June-July and during mid-November to early January which is the post harvest period of summer and winter crop of potato respectively, the number of cultivator commuters increase (the cultivators market their surplus in the city by themselves, middlemen do not go to the village to buy the products).

Large quantities are brought by hired trucks and trailer jeeps available in the village itself while small quantities - mostly green vegetables, are also brought by village buses. The trucks and trailer-jeeps are lend by the owners (who are mostly rich villagers) at a rate of Rs.10/- per quintal from the village to the city, while the rate for one basket (containing 10 kg) of cauliflower is Rs.5 and one basket of cabbage is Rs.2/-.

Besides the above category of commuters, yet another significant category of commuters are the students, mostly college students from the village. There are about 50 students studying in various colleges in Shillong, and form 2% of the total daily commuters. A majority of them commute daily while very few stay in Shillong itself and go to the village during weekends.

A contrasting study to this is that of village Umsemlem. Though located along the National Highway connecting

Shillong to Guwahati with hourly city bus service available as also the state transport buses, yet there is lack of any noticeable commuter population to Shillong.

There are no daily commuter from Umsemlem, but there is a significant number of weekly commuters - about 45%. Those weekly commuters, coming by minibus or busty bus, bring very insignificant quantity of fruits such as pineapple, banana, etc. for sale in Shillong market, their sole purpose for commuting to the city being that of purchase of other consumer goods such as cloths, medicine as also sometimes foodgrains - though the villagers depend more on Umsning for the purchase of the later.

There is a total absence of workers employed in Shillong which may be because of the very few literate people only 4.78% of the total population, as also the very less percentage of semi-skilled workers. These semi-skilled workers are employed in the Government offices in Umsning, and in household industries such as carpentary, blacksmithy and tailoring in Umsning and nearby villages.

The village being very poor, non of the villagers own private means of transport.

### Conclusion

From the forgoing analysis, we find that the impact of influence of Shillong goes on diminishing with distance.

Villages nearer to Shillong tend to show the characteristic changes in the landuse, occupational pattern etc. over the years, while the degree of such changes goes on diminishing with distance and further away villages, even those linked by transport lines does not register any significant change.

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CHAPTER - IV

## CROPPING PATTERN UNDER URBAN INFLUENCE

Despite the advantage of being close to a consumer market with relatively high purchasing power, an agriculture farm on the fringe of a developing metropolis may not be a secure proposition. For one thing it is constantly under the threat of being swallowed up by urban landuses such as housing and industries. In order to compete effectively with urban landuse, agriculture in the fringe area is compelled to make structural changes and adopt capital intensive innovative farming practices and be selective in the choice of crops grown.<sup>1</sup> An important aspect, therefore, of the landuse problem in the rural-urban fringe is the shift of agriculture land from foodcrops land to cash crop land and consequent cropping pattern change in favour of cash crops.

The perception of economic opportunities provided by the city market and extent to which the farmers in the fringe area respond to these depend to a considerable extent on cultural and social factors affecting the development of farm operators and their economic status. Besides the size of farm also influence the decision of the farmer in his choice of crops and expectations of returns.

Thus the intensity and a real extent of cash crop cultivation in the urban fringe area is related to the

response of the farmers to the city's demand.

### The General Trend

The change in rural landuse, particularly the shift from subsistence foodcrops to market oriented crops is noticeable in almost all the fringe areas of the country's big cities. In the agricultural productive coastal strip along the western railway in the fringe of Bombay shows too distinctly this change from a predominantly subsistence paddy culture to a market oriented economy. In north Kolaba the change came during the 50's. The predominance of foodcrops, particularly of paddy began to decline and cash crops began to dominate the cropping pattern. The urban influence has penetrated further than this zone. In South Kolaba, twenty five years ago, practically the entire cropped area was under foodcrops. But in the following years, as C.D. Despande remarked,<sup>2</sup> this total dominance of foodcrops declined.

This trend is also observable in other urban fringe such as that of Hyderabad where structural changes in the economy of the peripheral settlements have been caused by suburbanisation.<sup>3</sup> Commercialisation of agriculture and monetisation of the economy have inevitably followed the expansion of urban influence. Not only has the cropping pattern changed from traditional subsistence foodcrops such as paddy to market oriented commercial crops such as vegetables, but it has also changed from mono-cropping to double and multiple cropping.

### Cropping Pattern in Nongkrem

Cropping pattern in Nongkrem is dominated by cash crops. It may be seen from Table No.5 that 80.83% of the total cropped area is under commercial crops which includes potatoes and vegetables, which only 16.32% is under food-grains (cereals) of the total area under crops, 27.98% is under double and multiple cropping, while 19.17% is under current fallow.

Coming to the cropping pattern of the 20 cultivators under study, we find that it is dominated by commercial crops. About 78.05% of the total cropped area is under commercial crops (potato and vegetables) while just 21.95% is under foodcrops (cereals). In 1977-78 area under commercial crops was 67.07% while in 1983-84 it rose to 75.5%. Area under cereals on the other hand went down from 32.92% in 1977-78 to 24.49% in 1983-84. Thus the increase in area under commercial crops during the decade was 16.37% while that of cereals declined by 48.51%. This can be seen from the following table.

Of the commercial crops, potato is the most important, accounting for more than 52% of the total cropped area. Over the years, area under this crop has shown a tendency for increase as also that of green vegetables which covers about 25.30% of the total cropped area. On the other hand area under rice show a tendency of steady decline - from 24.24% in 1975-76 it has gone down to just 12.65% in 1985-86.

Table 5: Area Under Crops in Nongkrem

Crops	1975-76		1980-81		1985-86	
	Area (in hec.)	% of area	Area (in hec.)	% of area	Area (in hec.)	% of area
Foodcrops	46.75	32.92	37.62	24.50	36.37	21.95
i) rice	33.00	24.24	28.50	15.88	20.50	12.65
ii)maize	13.75	8.69	14.12	8.61	15.87	9.30
Commercial crops	89.00	67.07	103.47	75.50	113.97	78.05
i) potato	60.75	46.67	69.47	51.49	75.97	52.75
ii)vegetables	28.25	20.40	34.00	24.01	38.00	25.30
<b>Total:</b>	<b>135.75</b>		<b>141.09</b>		<b>150.34</b>	

Source: Field study.

Area under Maize have been fluctuating. It showed a very marginal decline in area during 1980-81 but has showed up again in 1985-86 to 9.3% from 8.61%. (Fig.8).

Though land records for the earlier decades is not available, yet from the knowledge of the village headman and other village elders (of which one also happen to be an ex-Inspector of Agriculture) the cropping pattern in the village was dominated by potato followed by rice as the second ranking crop areawise, the third ranking crop having been maize. Area under green vegetables was very insignificant. We see a changed pattern now where after potato, green vegetables takes the second place areawise.

#### Cropping Pattern in Umsemlem

Area under Umsemlem shows the dominance of traditional foodcrop. But though the area under foodcrops is more,

### Area under crops - Nongkrem.

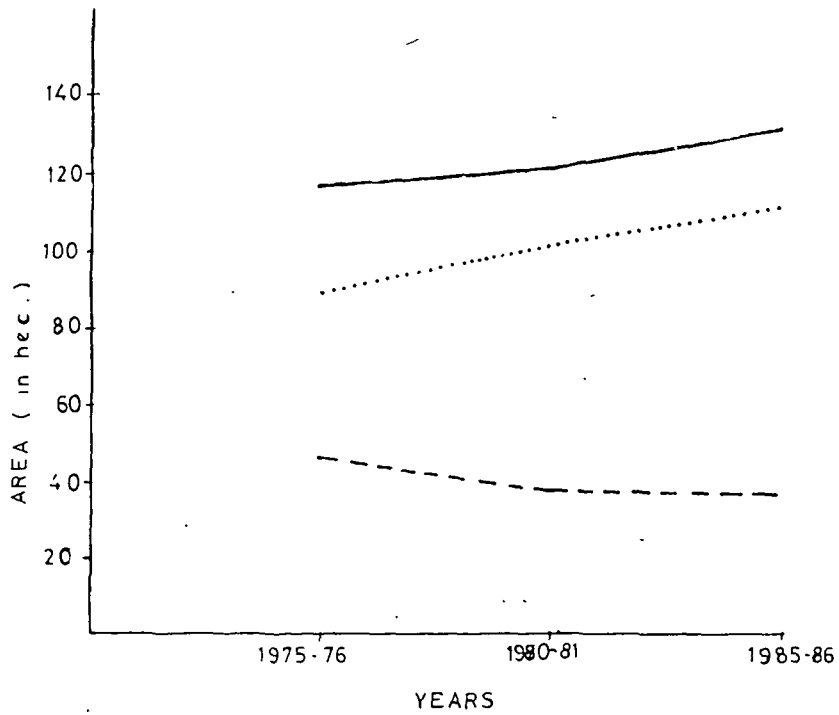


FIG. 8

### Area under crops - Umsemlem

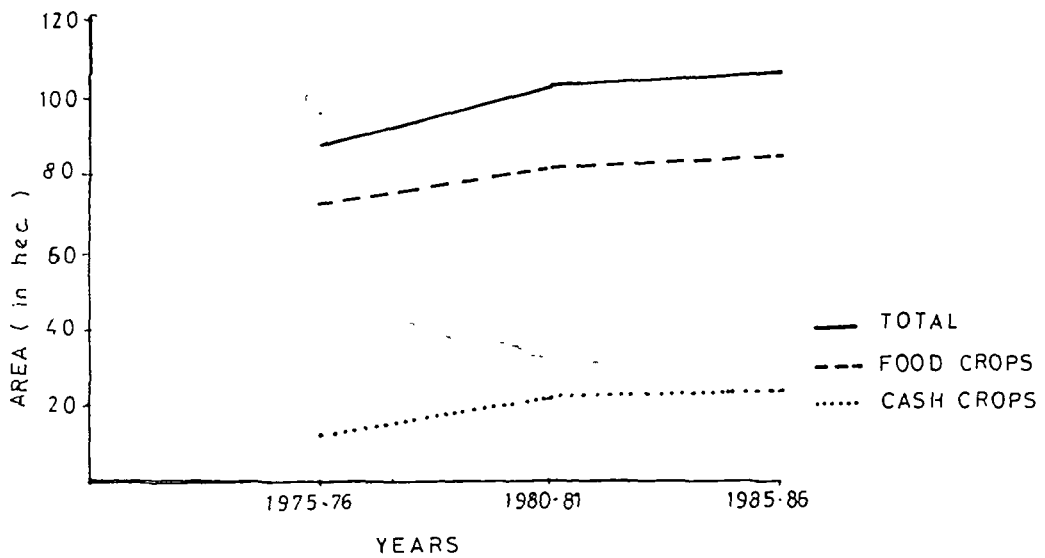


FIG 9

more than 78.76%, a decline in the area under them, however, more is detectable. As shown by the following table (Table 6) from 81.83% in 1975-76, it has gone down to 79.59% and 78.76% in 1980-81 and 1985-86, respectively.

On the other hand area under commercial crops have been increasing, though slightly, over the years from 18.19% to 21.24% from 1975-76 to 1985-86.

On the whole cropping pattern in the village reveal monotony and little diversification as seen in the table. Rice is the dominant crop with more than 3/4th of the total cropped under it and its areawise position has remained so over the past decade. But area under crops such as ginger, maize and fruits show some interesting change. (Fig. 9).

Table 6: Area under Crops in Umsemlem

Crop	1975-76		1980-81		1985-86	
	Area (in hec)	% of area	Area (in hec)	% of area	Area (in hec)	% of area
Foodcrops	70.97	81.80	80.38	79.59	83.88	78.76
i) rice	63.53	69.87	72.13	76.16	75.86	
ii)maize	7.44	5.99	10.52	8.44	9.66	6.91
Commercial crops	15.78	18.19	20.61	20.41	22.61	21.24
i) ginger	7.11	6.89	7.37	6.03	7.37	5.60
ii) fruits	4.00	2.70	8.00	6.74	8.00	6.22
iii)Others	4.61	3.52	5.24	3.64	7.24	5.43
Total	86.75		100.99		106.49	

Source: Field study.

Area under maize have shown fluctuations. It declined from 8.44% in 1980-81 to 6.91% in 1985-86. Percentage of

area under ginger have also been declining from 6.89% to 5-6% during the decade. This percentage decline is not because of decline in area under ginger, but overall increase in total cropped area while area under ginger had remained the same. Area under fruits had also increased from 1975-76 to 1980-81 by 4.04% but after that there was no increase in area and hence the percentage of area under them declined. Thus there is no marked increase in area under commercial crops.

#### Relationship between the city population and cash crop cultivation

The intensity and real extent of the cash crop cultivation in the urban fringe area is related to the response of the farmers to the city's demand.<sup>4</sup> Thus in the absence of data on the city's demand pattern for agricultural goods, we can substitute the population growth for demand in the city's markets.

A statistical measure of the relationship between the city's population and area under cash crops is not worthwhile here because of the very few number of observations. Only 2 sets of observations for 1971 and 1981, since record of the area under different crops prior to this period is absent. But a comparison of the trend in change of the two variables brings out the probable relationship as indicated in the following table.

Table 7: Shillong's Population and Area Under Cash Crops

Year	Popula- tion (in lakhs)	Percen- tage annual increase in populn.	Area Under Cash Crops in:			
			Nongkrem		Umsemlem	
			Area (in acres)	Percen- tage annual increase	Area (in acres)	Percen- tage annual increase
1971	1.23	-	82	-	13.78	-
1981	1.73	1.6	103	2.56	20.61	6.83

Source: Census Handbook, Meghalaya & Field Study.

Population of Shillong had been increasing annually at the rate of 1.6 during the decade 1971-81. Area under commercial crops have also been increasing. But the annual increase in the area in Nongkrem is much less than Umsemlem. only 2.56% while Umsemlem has an annual increase in commercial cropped area by 6.83%. (Fig. 10).

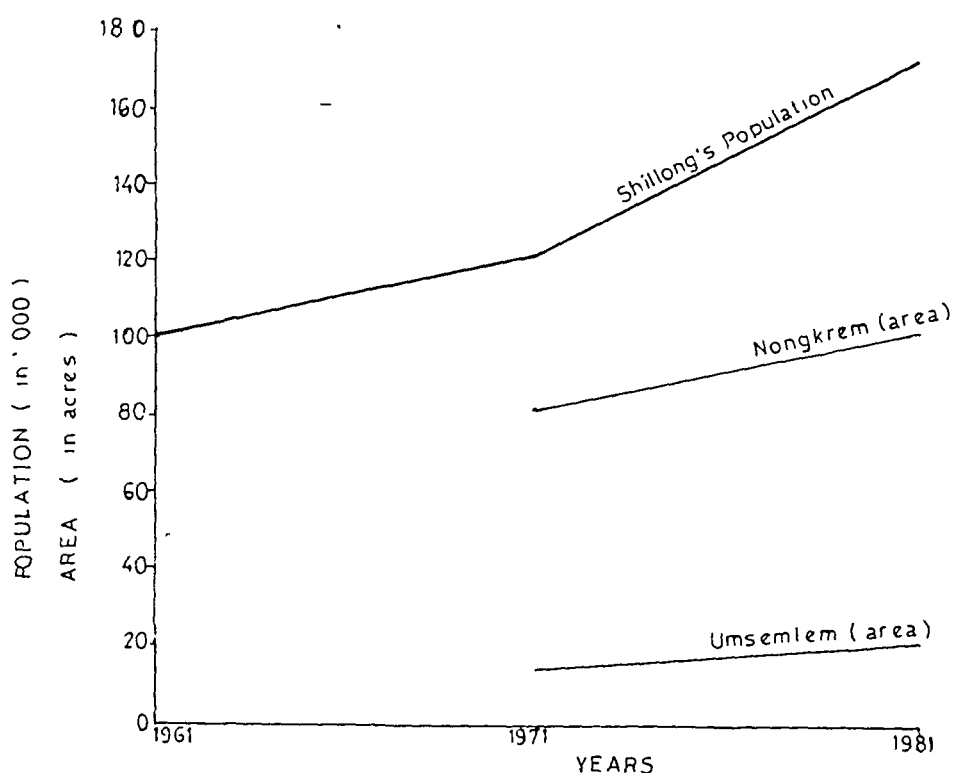


Fig. 10: Shillong's population and area under Cash Crops.

Though Nongkrem has more area under cash crops, the less increase in area can be explained by the constraints posed by the physical structure of the village. It is situated in an area of steep slopes and an area dotted with large rock outcrops which renders bringing more area under cultivation difficult. Also in many places, the top soil cover is very less.

Umsemlem, on the other hand, has much potentials for bringing more land under cultivation. It is situated on a relatively level land with very gentle slope and fertile soil. Thus with land development and provision of minor irrigation facilities more land can be utilized for cultivation purpose, which in fact have been happening here.

#### City's Consumer expenditure pattern on agricultural products and cropping pattern

The city's expenditure pattern on food items such as foodgrains as well as vegetables, etc. gives an indication of the pattern of urban demand on the food items. Thus after taking into consideration the change in prices during the study period, increase in expenditure pattern on the goods would indicate the increased demand. This when related to the increase in area on production through improved methods as also intensity of cultivation, would indicate the response of the farmers to the city's demand.

An index of expenditure and price relatives for Shillong

were worked out. The expenditure index is given in the following table.

Table 8: Index of Per Person Expenditure (base year 1973).

Commodities	1973	1978	1983	I.N. of expenditure 1978	I.N. of expenditure 1983
Cereals	21.52	22.85	43.47	106.18	202.00
Vegetables	5.37	6.25	15.94	116.39	296.83

Source: Sarvekshana, Journal of N.S.S.O. Vols. IX No 3 Jan 1986, Vol IX No. 4, April 1986.

The expenditure index for cereals was 106.18 for 1978 and 202 for 1983, while for vegetables it was 116.39 and 296.83 for the respective years. This shows an increase in expenditure on cereals by 6.18% in 1978 and by 102% in 1983 over that of the base year (1973). The increase in expenditure on vegetables for the respective years over that of the base year is 16.39% and 196.83%.

A comparison of the trend in Price and expenditure by bringing out the difference in price rise and expenditure shows the increased expenditure on vegetables, particularly during 1978-83, while it shows a decreasing trend of expenditure on cereals (Table 9).

Table 9: Percentage increase - Price and Expenditure.

Commodities	Price 1978	Expenditure 1978	Price 1983	Expenditure 1983
Cereals	31.08	6.18	124.32	102.00
Vegetables	12.78	16.39	61.01	196.83

Source: Office of Economics, Statistics & Evolution, Shillong; and Sarveshana, Journal of N.S.S.O. Vol IX. No. 3 Jan 1986, Vol IX No. 4.

In case of cereals, price rose by 25% more than expenditure in 1978 and by 22.32% more in 1983. This indicates a decline in consumption of cereals during the mentioned period which may have been due to the price rise.

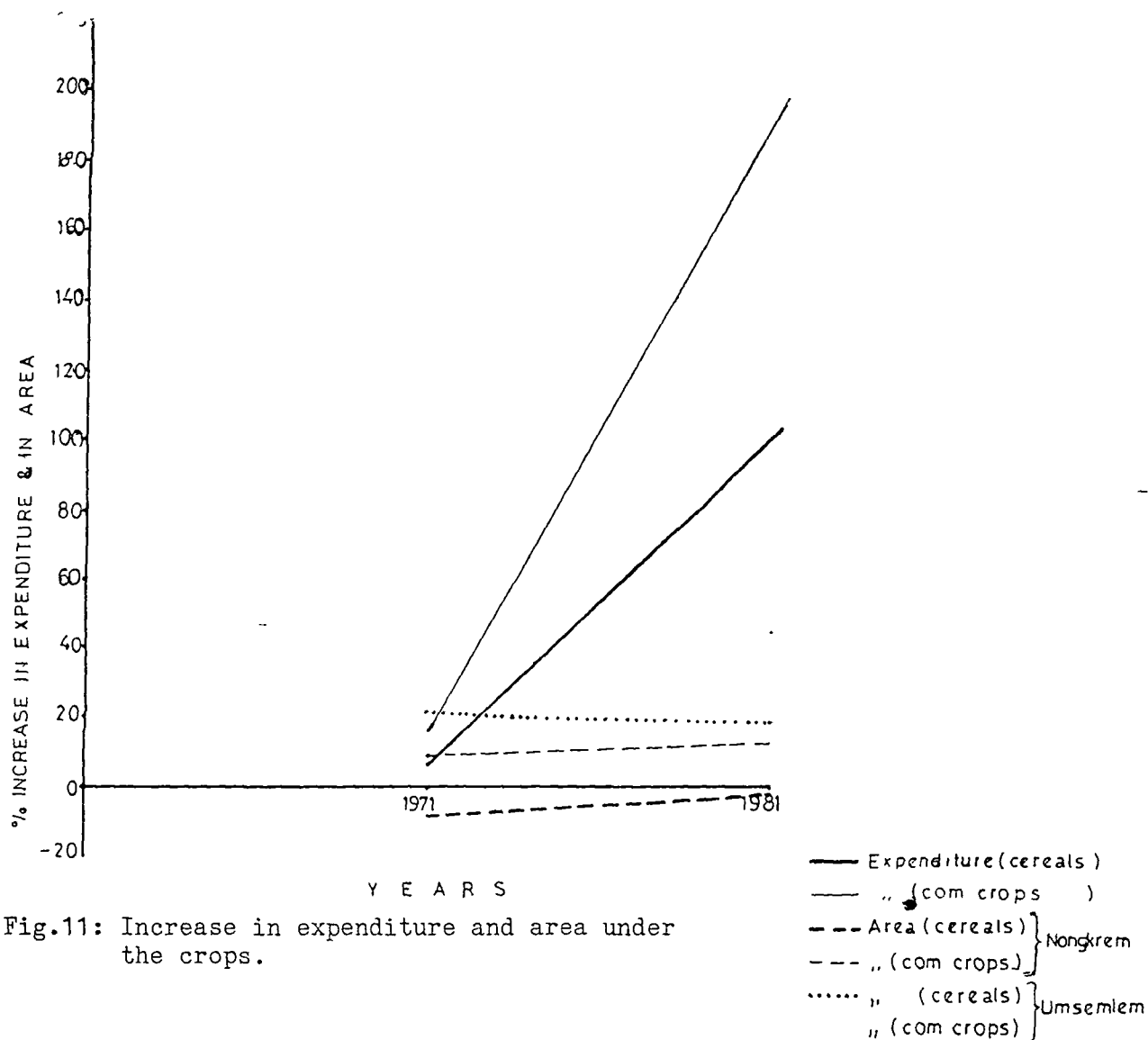
But on the other hand, expenditure on vegetables have been increasing. Expenditure rose by 3.61% over price in 1978 and by 135.83% in 1983. Thus while consumption of cereals have decreased consumption of vegetables can be said to have increased, tremendously in the later period i.e. 1978-83.

These trends of expenditure on the items when examined in relation to the trend of change in cultivated area under them shows an association. This is clear from table 4. Increase in expenditure on cereals (foodcrops) is very less Simultaneously, area under them in Nongkrem has declined during both the periods i.e. 1974-78 and 1978-83 while increase in area under them in Umsemlem is much less than that of commercial crops. Same is the case in Nongkrem too

Table 10: Increase in Expenditure and in area under the Crops

Crops	1978			1983		
	% Increase in Expendi- ture (Shillong)	% increase in area (Nongkrem)	% increase in area (Umsemlem)	% increase in expendi- ture (Shillong)	% increase in area (Nongkrem)	% increase in area (Umsemlem)
Cereals	6.18	-8.42	21	102.00	-0.97	18.19
Commercial crops	16.39	8.43	30.60	196.83	10.98	43.28

Source: Office of Economics, statistics and Evolution, Shillong.



where area under commercial crops have increased. This is in close association with the increase in expenditure on the products of commercial crops (Fig. 11).

Thus the trend of change in the area under the crops is in favour of commercial crops in both the villages. The change may have been mainly due to two reasons -

Firstly, the increase expenditure on commercial crops, and

Secondly, increase price expectations in case of the commercial crops.

Also the city's expenditure on consumption pattern of cereals does not affect, to a real extent, the cereal's production not only in the fringe areas, but also in the rest of the producing areas of the state since cereals, particularly rice is mostly imported from outside the state. But commercial crops most of which comprises of perishable crops such as vegetables, are mostly obtained by the city's markets from within the state, preferably from the producing areas of the fringe, in the absence of cold storing facilities.

This dependence of the city's market on the fringe villages for perishable goods like vegetables directly leads to increased production of such crops by rational farmers through either by allocating more area under them or else in case of shortage of cultivable area, through intensive farming by double and multiple cropping as well as applica-

tion of more inputs.

Nongkrem has majority of the agricultural land under vegetables - potatoes and green vegetables, as seen in table 5 while, Umsemlem, though has less area under commercial crops such as ginger and fruits, have been allocating more and more area under them as seen in table 6.

#### Urban Impact and Innovation in Cropping Pattern

The impact of the city's influence is also visible in the cropping pattern through the adoption of new technology such as the application of improved seeds, use of modern agricultural implements and chemical fertilizers. As K.N. Gopi puts it, "the impact of the city's influence is nowhere more visible in the sphere of economic activities through the adoption of modern technology such as the use of electric pumps, application of better seeds, use of modern agricultural implements and chemical fertilizers"<sup>5</sup>. This trend has been distinctly observable in case of Nongkrem, where almost the entire area under crop is treated with chemical fertilizers. In fact, one of the reasons for the farmers of Nongkrem coming to Shillong is for the purchase of chemical fertilizers.

But we find that the application of improved seeds is for only certain crops, viz., only for potato and green

Table 11: Nongkrem: Application of Modern Inputs.

Inputs	Crops	Units	1975	1985
I. HYV	Potato	Quintal	73	101
	Green Vegetables	"	54	62
	Rice	-	-	-
	Maize	-	-	21
II. Local	Potato	Quintal	35	21
	Green Vegetables	"	-	1
	Rice	"	25	15
	Maize	Kg	12	6.5
III. Chemical Fertilizers	For all Crops	Quintal	49	78
IV. Manure (cowdung)	For all crops	Truckful	116	76
V. Insecticides	"	Kg	124	148

Source: Field study.

vegetables. Improved seeds for rice or maize is not used here.

This is because of two important reasons:

Firstly, rice is not an important crop of the village. Secondly, the village lies at an altitude of above 1700m and there is no suitable high yielding varieties of rice and maize for the higher altitude ranges and hence cultivators are still growing the traditional local varieties.<sup>6</sup>

On the other hand, application of improved seeds only for the commercial crops can have another implication.

This may indicate the importance conferred to these crops over the others due to its high demand in the city markets. From the table, it can be seen that almost the entire area under potato is covered by HYV while 75% of the area under green vegetable are under them. Percentage share of area under them had been increasing over the mentioned years.

Application of fertilizers and pesticides have also been increasing over the years. 90% of the required improved inputs are obtained from Shillong, particularly from the Agricultural Development Office, while the remaining is obtained from the Block Development Office at Mawryngkneng.

The use of improved inputs in Umsemlem is very insignificant and records of quantity etc. used are not available. This can also be interpreted as a very low urban impact due to the distance factor.

## Conclusion

Change in cropping pattern in the fringe is obvious as is seen from the forgoing analysis. Increase in urban population, and hence increase in urban demand for food items, particularly agricultural products, reflects on the production of these items. A change occurs in the cropping pattern in favour of these crops - such as vegetables. This change has been 1) by converting more of food crops land to commercial crops lands (2) by bringing in more cultivable

land under actual cultivation, and (3) bringing in more area under HYV for increased production, as also by application of modern fertilizers, etc. to increase the production. The degree of this change has been more in Nongkrem than in Umsemlem, obviously due to the distance factor influencing the extent of urban impact.

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## SUMMARY AND CONCLUSION

## SUMMARY AND CONCLUSION

By and large, Shillong's development is following the familiar pattern of the rest of the country, where urban population has been growing at a fast rate with resultant urban expansion over space accompanied by relatively slow growth rate of urban facilities. Over the years, the Class I towns or the urban agglomerations have been experiencing increased concentration of population as against the lower class towns. Result is not only poor sanitation, scarce housing facilities, water supply and other such urban facilities, felt in the suburban areas or urban areas outside the Municipality, but also scarcity of agricultural land due to a change in landuse.

As has been noticed in many like studies, this change in landuse in the fringe areas is in favour of urban landuse. This change is influenced by location which is a function of transport means. Thus the suburban zone or the inner fringe areas are taken over for residential use while the outer fringe areas or rural fringe face a change in terms of the cropping pattern in the agricultural land. The change is in favour of cash crops as also other perishable agricultural goods which are in demand in the town such as vegetables, fruits as well as dairy products, eggs, etc.

Expansion of urban fringe and encroachment over the rural countryside has also been noticed in case of Shillong, over the decades. A town established by the British in 1874 with administration as its prime function, it has over the decades, also developed as an educational and recreational centre which has attracted a number of immigrants from within and outside the state, resulting in a rise in population of the town from just 9621 in 1901 to 173064 in 1981. Shillong's expansion is a radial areal expansion which is not necessarily circular but sectoral depending upon the pattern of transport route. The process of urban expansion over space has been noticeable since 1901 in the continuous amalgamation of the surrounding villages into it. The town included in its fold the outlying villages of Mawkhar, Jaiaw, Laitumkhrah on its periphery. In 1961, Mawlai and Nongthymmai were engulfed in the urban expansion as also Pynthorumkhrah and Madanrting in 1981. Thus Shillong grew from a Class V town in 1901 to Class IV in 1911-12, Class III in 1931-41 and Class II in 1951-71 to Class I, an urban agglomeration in 1981.

In this continuous process of fringe development, the outlying villages like Umsning, Laitkor, Mawphlang and Upper Shillong, as T. Cajee puts it, will be engulfed in near future as also the interior villages like Smith, Mawpat, Umroi, and Mawiong and probably even Nongkrem and Umsemlem.

Already, as T. Cajee observes, a pattern where the

intercity migrants shift to villages in the periphery of the city, has developed around Shillong urban agglomeration. A sizable and growing number of commuters move back and forth from the city to quite distant villages like Laitkor, Myllem, Smith, Mawphlang, etc. This commute population are bringing tremendous change in the traditional static village society.

### Urban Influences

The influence of Shillong on the fringe as well as interior villages have been visualised in the following factors:

1) Locational, 2) Transportational, 3) Recreational and 4) Institutional.

The study of the two villages, at varying distance from Shillong, highlighted the locational and transportational factors as of greater significance than the others.

#### 1) Locational

A detailed study of the two villages at varying distance on the fringe of Shillong highlights the importance of location in rural urban interaction. The varying degree in landuse intensity, landuse change, pattern of non-agricultural and agricultural labours etc. in these two villages shows the association of time and distance to location.

### Landuse Change and Intensity of Landuse

Since the villages are still outside the zone of urban built up area, the change in landuse from agricultural to urban landuse is not noticeable, but what is noticeable is the change which has taken place in the cropping pattern. Villages such as Nongkrem which are nearer to the city and on the process of becoming urbanised villages, are facing a change in agricultural landuse from traditional food crop land to non-traditional commercial crop land. On the other hand, villages such as Umsemlemlem which have not as yet attained the status of urbanising village, and though traditional foodcrops still dominate the cropping pattern also shows significant changes in the agricultural landuse pattern

While examining the intensity of landuse, we find that the intensity of agricultural landuse has increased over time in villages such as Nongkrem. A decade back, most of the agricultural land was cropped just once and, dominated by the practice of jhum cultivation, a large part of the cultivable land was left fallow for a longer period of time. But in recent years, particularly in the last five to six years, there has been a tendency of decline in the share of fallow land - a direct result of the decline in practice of jhum cultivation from 60% to 48% during a decade's time. Also at present, almost the entire cropped area is under double and multiple cropping.

However, most of the agricultural land in Umsemlem are still under single cropping.

### Non-Agricultural Workers

The percentage of non-agricultural workers in Nongkrem is more than in Umsemlem. More than half the working force, i.e. 55.53% of the total workers are non-agricultural workers in Nongkrem. It was only 11.32% a decade back, while there was a total absence of non-agricultural workers in 1971 in Umsemlem. But during the decade, a class of non-agricultural workers have emerged in the village, though the share of this category workers is very small, only 6.45%.

In Nongkrem the pattern of non-agricultural workers clearly indicates an urban influence. Of the 55% non-agricultural workers 50% are employed in the cities' various government offices as clerks etc. and in various small scale industries. The remaining 25% are engaged in other activities in the village. In 1971, the number of non-agricultural workers employed in Shillong amounted to only 5%. Thus in Nongkrem, a tendency of more and more of the workers switching over to jobs in Shillong is observable.

Not only this, but there is a growing tendency for members of the farming households of Nongkrem to take up non-agricultural occupation, particularly in Shillong. During the off-season, some of the farmers collect ornamental plants and orchids from the nearby jungles and sell them in Shillong.

Thus diversification of economic activity has emerged as an important characteristic feature of Nongkrem as a village on the verge of becoming urbanised.

## 2. Transportational Influence

The transportational influence over the two villages is quite apparent. Hourly bus service to Umsemlem are available from the city. In Nongkrem though hourly city bus service is not available, only four bus services are available, yet many of the villagers have private means of transportation. Also the number of commuters from both the villages differ. Daily commuters to the city from Umsemlem is absent while there are very few weekly commuters. On the other hand, 30% of the working population of Nongkrem employed in the city commute daily from the village. Also number of commuters increase during the post harvest periods of potato and vegetables when the cultivators bring their surplus to the city market. The cultivators of Umsemlem bring their very negligible quantity of surplus, particularly fruits, to the Shillong market in between the periodic market in Umsning. This is because of lack of storing facilities for agricultural products and hence when the fruit crops ripen, they are compelled to bring them to Shillong market.

This difference in the commuter population is because of the following factors:

- 1) The difference in distance due to varying location,

- 2) The altitude at which the villages are situated against that of the city.
- 3) Other transport facilities available from the villages itself besides those provided by the city.

The first point is obvious - Nongkrem is nearer to Shillong than Umsemlem and hence lesser time is taken in commuting. The second point can be explained by the fact that Nongkrem is situated at a higher altitude than Shillong and hence because of the descend, takes still lesser time while Umsemlem at a lower altitude to Shillong, <sup>commuters</sup> have to ascend upto Shillong which takes obviously longer time. Thus transportation of agricultural goods from Nongkrem to Shillong takes lesser time and at a lesser cost.

Besides the bus services provided by the city, Nongkrem also have private means of transportation. Trucks and jeeps are available for hire from the villagers itself at a reasonable rate. In fact, it is by these means that the cultivators bring their surplus. On the other hand Umsemlem can boast of no such facilities and have to depend entirely on the city services.

### Cropping Pattern Changes

So far as cropping pattern is concerned changes in three points of time 1977-78, 1983-84 and 1987-88 for the two villages have been studied. Agriculture in Nongkrem, the village nearer to Shillong, show the dominance of com-

mercial crops. Though agro-climatically the village falls within the belt favourable for cauliflower, cabbage, etc. because of which the dominance of these crops has been marked even from much earlier, earlier than one decade back, yet nevertheless foodcrops such as rice, maize, etc. also had importance, if not equal importance. Yet, we find a declining trend in the area under these foodcrops over the years from about 32% to 21.95% during a decade's time. Cash cropped area, on the other hand, have been increasing from 67% to 78.05% during the same period.

Not only that, cropping pattern have changed from single cropped area to double and multiple cropped area. To meet the challenge of the increasing urban demand, the cultivators of Nongkrem are cultivating both potato and vegetables more than twice. Only two cultivators were found to cultivate just twice a year.

Contrary to this, cropping pattern in Umsemlem does not show significant change. Cropping pattern is still dominated by traditional foodcrops such as paddy and maize. The cropping pattern is also characterised by a number of crops grown, as much as five different crops are grown. Though agro-climatically the village is favourable for cultivator of a variety of fruits such as pineapple, banana, etc. yet share of area under them is very low. Cereals such as rice and maize cover 75% of the total cropped area while fruits

and ginger together cover 11%. The remaining is devoted to sweet potato etc. But here too, though foodcrops such as cereals dominate the cropping pattern, a recognisable trend is the increase in share of cash crops such as ginger and fruits while area under crops such as sweet potato, tapioca etc. have declined. Percentage of area under ginger and fruits together forming the commercial crops, was just 9.59% in 1977-78 which increased to nearly 12% in 1987-88, while area under crops such as tapioca, sweet potato etc. declined from 4% in 1977-78 to just 2% in 1987-88.

Thus changing trend in the cropping pattern is related to response of the farmers to the city's demand for the commercial crops. Increase in the city's population is one factor leading to increased demand. Thus when we examine the increase in the city's population over the concerned period and the increase allocation of area under the commercial crops for the respective years, the relation between the two shows a direct urban impact. Population of the city had been increasing at the rate of 1.6% per annum, and simultaneously area under the commercial crops had increasing at the rate of 2.56% per annum and 7.83% per annum in Nongkrem and Umsemlem respectively.

The expenditure pattern of city's population on commercial crops is another factor which shows a probable relationship between the area allocation and market demand of the crops. Examination of the expenditure pattern on these pro-

ducts for 3 points of time shows an increasing trend on the expenditure. This is after taking into consideration the rise in price of these products over the years. Thus area allocation of these commercial crops shows positive relation with increased expenditure on the products.

The per annum increase in area under commercial crops in Nongkrem is much less than that of Umsemlem though percentage share of area under the crops is more in Nongkrem. This low rate of increase can be explained by the physical constraints due to which more area cannot be converted for agricultural purposes.

This constraint have been overcome by the cultivators of Nongkrem by increasing productivity of land with the use of improved seeds, chemical fertilizers, pesticides, etc. The use of improved inputs also reveals the favour given to commercial crops, HYV of seeds are used only for potato and green vegetables only while chemical fertilizers such as urea, are applied to all the crops - cereals including. Out of the 20 cultivators under study, only 2 used local seeds while another 2 used both local and HYV varieties. The rest used HYV of potato and green vegetables. The production of potato using local varieties is only 28 quintals per acre while production using HYV is 40-42 quintal per acre.

Thus cultivators of Nongkrem have taken to application of HYV for increasing productivity. The improved inputs,

as is obvious are obtained from the city and consists of a major part of the commodities purchased from the city by the villagers - intensifying the economic interaction between the village and the city.

Thus the rural-urban interaction is achieved through the city supplying the villages with agricultural inputs, medical facilities, consumer goods, etc. as also offering employment, educational facilities, etc., and the villages supply agricultural products to the city.

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## APPENDICES

APPENDIX - I  
QUESTIONNAIRE FOR AGRICULTURAL SURVEY

SEC. I

I Name of the Block.  
Kyrting jonka Block.

II Name of the village.  
Kyrting jongka shnong.

1. Name of the Cultivator.  
Kyrting jongu Nongrep.

2. Age.  
Ka rta.

3. Crops cultivated.  
Ki jingthang ba kitheng.

4. Crops cultivated 10 years back  
Ki jingthang ba ki theng shiphew snem mynshewa \_\_\_\_\_

\_\_\_\_\_

5 years back  
San snem mynshewa \_\_\_\_\_

5. Area under  
Ki jaka rep.

At present	5 years back	10 years back
Mynta	San snem mynshewa	Shiphew Snem

Rice (local)  
U Khaw (Sym-  
bai lajong)  
Rice (HYV)  
U Khaw(Symbai  
Sorkar)  
Maize  
Riewhadem  
Tapioca  
Phan diongg  
Potato  
Phan  
  
Ginger  
Syng  
Bettle nuts and  
Bettle leaves  
Kwai Tempew  
Other Crops  
Kiwei pat

6. Total Production (approximately)
- Ka jingmih
  - Rice (local)
  - Khaw (Symbai lajong)
  - Rice (HYV)
  - Khaw (Symbai Sorkar)
  - Maize
  - Riewhadem
  - Tapioca
  - Phan dieng
  - Potato
  - Phan
  - Ginger
  - Sying
  - Bettle nuts &
  - Bettle leaves
  - Kwai Tempew
  - Others
  - Bad kiwei
7. Surplus if any (write the quantity)
- Jingmih batam
8. Total cultivated area  
(approximately, if no record  
available).
- Ka jingheh ka jaka rep
- |            |                     |                         |
|------------|---------------------|-------------------------|
| At present | 5 years back        | 10 years back           |
| Mynta      | San snem<br>mynshwa | Shiphew snem<br>mynshwa |
9. Inputs used (mention the quantity)
- Ki jajpyndonkam
- |  |                      |                     |                        |
|--|----------------------|---------------------|------------------------|
|  | At present           | 5yrs back           | 10yrs back             |
|  | Myntanem my<br>nshwa | San snem<br>mynshwa | Shiphew sne<br>mynshwa |
- i) Improved seeds
    - U symbai
  - ii) Fertilizers
    - Ka sboh
  - iii) Insecticides
    - Ki dawai pyniap-  
khniang
  - iv) Others
    - Bad kiwei



15. Approximate expenditure on -  
 Ka jingpynlut  
 Improved seeds (Ka Symbai)  
 Fertilizers (Ka Sboh)  
 Insecticides (Ka dawai pyniapkhinang)  
 Irrigation (Rukom ring um)  
 Implements (Ki tiartrei)  
 Labour (Ki nongtrei)  
 Others (Bad kiwei)
16. Source of finance (Ka jaka ba phioh pisa)  

Bank	Money lender	Co-operative bank	Others
-do-	Ki nongairam	-do-	Bad kiwei
17. Nearest Market-Centre  
 Ka Iew Kaba jan eh
18. How many days a week (on a year)  
 Do you come to Shillong for marketing your surplus?
19. i) How do you bring the surplus for sale to Shillong?  
 ii) What is the cost of transporting the surplus -  

(a) by truck
(b) by trailer jeep
(c) by bus.
20. Are you still practicing Jhum cultivation?
21. i) If jhumming has decreased, why?  
 ii) Since when?  
 Why have your agricultural land increased or decreased over the past 10 years.
22. Do you use any agricultural labour?  
 i) Why are they engaged?  
 ii) Are the labours from the village or from outside?  
 iii) If from other villages, from how far?  
 iv) Why labours from other villages are engaged?  
 v) Do these labours come everyday from their villages or do they stay in your village during the season of work?

## SEC. II QUESTIONNAIRE ON COMMUTING

23. i) Do you sell anything else besides agricultural products in Shillong?  
ii) What products?
24. How frequently do you come to Shillong for selling your products?
25. Do you come to Shillong for any other purpose besides the above purpose?
26. What things do you purchase from Shillong?
27. Are there any member of the family working in Shillong?
28. What kind of job are they doing?
  - i) Government job.
  - ii) Small industries.
  - iii) Others.
29. do they stay in Shillong?
30. How frequently do they come home (to the village)?
31. Are they are members of the family studying in Shillong?
32. i) Do they stay and study in Shillong?  
ii) do they go everyday from the village?

APPENDIX - II

Table 1. Land Classification 1985-86 (Area in hec.)

Village	Total area	Unclassified forest	Area under crops	Jhum	Orchards & plantation	Wet & other permanent cultivation	Net area under crops	Area sown more than once	Land under non-agri. use	Current fallows	Pastures & permanent grazing land	Cultivable wasteland	Barren & uncultivable land
Nongkrem	2195	597	386	186	-	200	298	108	740	74	5	79	354
Umselem	297	43	87	-	-	40	62	-	7	8	-	30	20

Source: From the Block Development Offices, Mawryngkneng & Dhoi Area C.D. Blocks.

APPENDIX - III  
Table 2. Occupational Structure

Village	Year	Total Population		Literates		Total main workers		Cultivators		Agri. Workers		Household Industries		Other* workers		Marginal workers		Non-workers	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Nongkrem Marbah	1971	590	620	249	227	307	258	91	82	159	154	12	2	45	19	-	-	283	262
	1981	986	1050	485	467	472	423	8	13	184	151	19	24	261	235	7	514	514	620
Umsemlem	1971	83	80	15	14	46	-	46	-	-	-	-	-	-	-	-	-	37	80
	1981	140	132	5	8	83	41	73	39	4	-	-	-	6	2	-	-	57	91

Source: District Census Handbook, East Khasi Hills, Meghalaya.

Other workers - (1) Livestock, Forestry, fishing, Hunting, Plantation, Orchards & allied activities.

(2) Mining & Quarrying

(3) Construction

(4) Trade and Commerce

(5) Transport, Storage & Communication.

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