CHAPTER III

POPULATION GROWTH AND RESULTANT URBAN EXPANSION

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3.1 Introduction

After a detailed discussion on the geographical background of Shillong it becomes imperative to trace the historical growth of the city. Growth of Shillong as an urban centre can be traced to the British administration in India in the mid 19th century. However the present nature of urban growth of Shillong especially after the creation of the state in 1972 has been highlighted here as it is resulting to various geo-environmental concerns.

Shillong a hill station supports more than 60% of the urban population of the State. Due to its rugged terrain there are constraints in development. The topography is marked by relatively steep to steep slopes which restricts urban growth. Due to such topography large number of primary order streams dominates the landscape and this became the main source of water to the population living here. Under the impact of urbanization these streams are often the recipients of the effluents of the growing population of the city. These streams habitually disappear from the surface due to land reclamation and channelisation which leads to geo-environmental problems.

It has been observed that the townships of the Shillong Urban Agglomeration are growing at a much faster rate than the city proper which is acting detrimental to the geo-environment of the study area. These townships totally lacks in any form of organized solid waste disposal system. In the absence of proper solid waste disposal the effluents generated by this growing population are dumped into the streams, streets and roadside drains of the localities.

This is why the present chapter tries to analyse the nature and rate of growth of the urban components of Shillong.
This chapter basically deals with an overview of the rate of population growth and the resultant spatial growth of the city taking within its ambit the peripheral lands are not necessarily ideal for urban growth.

3.2 Shillong as an Urban Center

The process of urban growth of Shillong can be traced down to the period of 1863-64 when the British shifted their head quarters of Khasi and Jaintia Hills from Cherrapunjee to Shillong (Pakem 1984). Before 1864 Shillong was an unknown nomenclature. (Fig 3.1) Deep forests with Laban a small village and certain small villages under the United Khasi State of Shillong then covered its present area. It was in that year that Shillong became the administrative headquarter for the Khasi and Jaintia Hills. Hence the evolutionary history of the Shillong, being principally an administrative satellite center of the British Raj has till date preserved its characteristics of an administrative center essentially being service oriented.

With the acquisition of the Dewani of Bengal by the East India Company in 1765 A.D. (Chowdhury 1998) and the Yandaboo Treaty in 1826 A.D. (Chowdhury 1998) the Shillong plateau and the Khasi and Jaintia Hills came under the British rule. The British selected Cherrapunjee as the Military station for this region in 1829.

Due to the inclement weather conditions of Cherrapunjee as the highest rainfall place of the World and thoughts for better water supply facilities, the British administration felt the need to shift their headquarter from Cherrapunjee to a better centrally located area where water supply could be adequate as well as the weather
conditions are more pleasant. Consequently a Committee of Enquiry was appointed for this purpose, which comprised of Colonel Richardson (Syiemlieh 1989) the Commanding Officer of the British troops stationed at Cherapunjee and B.W.D. Morton the Deputy Commissioner of the United Khasi and Jaintia Hills.

The team after studying the surrounding areas like Sohrarim, Mairang, Laitlyngkot and Nonkrem ultimately selected a large open space to the north east and east of the Shillong peak as the future headquarter. But it was found that the area does not have sufficient water supply in all seasons of the year, thus such a location was not ideal for sustaining a larger population.

Finally it was decided that the best location might be the northern slopes of the Shillong Range and the Plateau of Iewduh, which is the present market center of Shillong and is now the heart of the city. Hence it is seen that the British administration gave due weightage to the water supply besides other factors before setting up the station here.

Accordingly on 8th December 1863, the British administration signed an agreement with the Syiem of Mylliem and Syiem of Khyrim (on whose state the proposed site was located) (Syiemlieh 1989).

It is seen that the geo-environmental factors were given due weightage by the British while selecting the location. The new Headquarter was located at an absolute relief of 1400m–1600m in the Umshirpi basin.
The British government went into an agreement with the Syiem of Mylliem and the Chief of Khyrim Raja Melay Sing and Raja Rabon Sing respectively who were ready to provide 1626 acres of land to the British Government for a token payment of Rs. 2000. The British acquired an additional seven hundred and fifty nine acres of land that was purchased from individual communities (Syiemlieh 1989), for the station here.

With the transfer of the head quarters from Cheerapunjee to Shillong which has a more centralised location between the Sylhet plains in the south and the Brahmaputra valley in the north included within its ambit of Sadew village, Nonghseh village, Mawkhar village, Laban and Laitumkhrah village.

In the year 1866 the then Lieutenant Governor General of Bengal Sir John Peter Grant sanctioned the transfer of the Deputy Commissioners establishment from Cherapunjee to Shillong. In the same year Colonel Hopkins who was the Commissioner of Assam Province and agent to the Governor General of India strongly advocated in favour of Shillong as the future Headquarter of Assam Province. Accordingly on March 20th 1874 Shillong was declared as the capital of Assam Province that had a population of about 1363 persons (Choudhury 1998).

But as the town grew bigger the British gave due importance to the solid waste management, though the population size was negligible and waste generated was small compared to the present size. Hence in 1878 the township of Shillong came under the Municipal Act by which the town affairs including water supply and solid waste disposal was managed by the Deputy Commissioner. Though not much information on the method and management of solid waste disposal of Shillong by the British is available, yet it can
be ascertained that the problem of solid waste disposal was not so large in magnitude as of today, primarily because of the small size of population and the nature of resource utilization.

As the town grew bigger it was necessary to acquire more land, consequently the British Government with other agreements took on perpetual lease from the Syiem of Mylliem, those portions which are now known as European ward, consisting of Police Bazar, Jail Road and the present Cantonment (Chowdhury 1998). The Lachumiere hill was added to the township in 1895 (Chowdhury 1998).

It is seen that even in the early days of Shillong settlements sprung up in the areas of the present city, which had a moderate slope, and in the area which could be easily accessible. Consequently the steep slopes of Upper Laban and Lumparing area in spite of being the sites of the earliest settlements did not grow at a fast rate as that of the moderate to moderately steep slope areas.

In 1901 the total population of the township was 9621 (Census 1981). The Shillong Municipality was established in 1910 and new areas such as Laitumkhrah, Hopkinson Estate, Malki and Mawprem were included under the Municipal boundary just after two years. The population recorded at Shillong was 13639 (Census 1981) showing a growth of +4018 and an increase of 41.76 percent (Table 3.1) as compared to the previous census records.

The population growth of Shillong before India's independence is shown in the table below:
Table 3.1: Population growth of Shillong before India’s Independence (1901-1941)

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Increase</th>
<th>Percentage increase</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901</td>
<td>9621</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1911</td>
<td>13639</td>
<td>4018</td>
<td>41.76</td>
<td></td>
</tr>
<tr>
<td>1921</td>
<td>17203</td>
<td>3564</td>
<td>26.13</td>
<td>Shillong Municipality Area</td>
</tr>
<tr>
<td>1931</td>
<td>23536</td>
<td>9333</td>
<td>54.25</td>
<td></td>
</tr>
<tr>
<td>1941</td>
<td>38192</td>
<td>11656</td>
<td>43.93</td>
<td></td>
</tr>
</tbody>
</table>

Source: Census of India, 1981 Provisional population total Meghalaya, series-14

The table 3.1 shows that the population of Shillong has a positive trend of growth even before Independence. This might have been attributed to the development of commerce and trade after the British established the administrative set up in 1874 when Shillong became the capital of the Assam province. The total population was 9621 in the beginning of the 20th century (1901 census) and increased to 38192 (1941 census) i.e. a total increase of 28571 persons in 1941 thereby showing about 296.96 percent increase.
Hence within a period of forty years the population of the Shillong municipality increased to three fold. Then Shillong emerged not only as an important administrative center of the British India but also as an important educational and commercial centre.

3.3 Shillong after Independence

After the Independence of India in 1947, Shillong experienced a new thrust of horizontal and vertical expansion due to large immigration and influx of displaced people from the erstwhile East Pakistan (present Bangladesh). Hence with these population increases there were resultant urban expansion of Shillong.

In 1951 census the population of Shillong was 58512 persons thereby showing an increase of 20320 persons from the previous census of 1941. The percentage increase was about +53.20 percent. Hence within ten years the increase of population was above 50 percent percent. The urban area however was restricted to the Shillong municipality and the cantonment areas.

No planning for residential expansion was done at this stage thus settlements started encroaching the steep slopes and rugged terrains of Lumparing, Laitumkhrah, Laban etc.

In 1961 the townships of Mawlai and Nongthymmai were included and formed two census towns of the Shillong Urban Agglomeration as indicated in Fig.2.2. Due to unrestricted residential expansion, changes in municipal boundary of the surrounding areas like Happy Valley, Umlyngka, Upper Shillong Nongkseh, Lawsohtun, Madanrting, Pynthurumkhrah, Nongmynsong and Umpling developed urban characteristics.
This growth trend continues till date. At present Shillong Urban Agglomeration consists of a total population of 267881 people distributed over seven units of the Shillong Urban Agglomeration viz. Mawlai, Nongthymmai, Madanrting, Shillong Municipality, Shillong Cantonment, Pynthorumkhrah, and Nongmynsong (2001 census).

To keep pace with the fast growth of the city the Meghalaya Urban Development Authority has come up with a Master Plan area of Shillong so as to introduce planned development by 2011. This master plan area recorded a population of 155600 persons in 1971 and 217274 persons in 1981 showing a growth rate of 39.64 percent. Since the population figures of the rural components were not available, the projected population for 1991 was 292445 with the same growth rate of 39.64 percent.

3.4 Expansion of Shillong since 1971

After the creation of Meghalaya in 21st January 1972, the capital of Assam was shifted to Dispur and Shillong became the capital of the newly created Meghalaya. The 1971 census of Shillong Urban Agglomeration shows a population size of 122792 persons as compared to 94039 persons in 1961 census, thus showing a marginal increase of 28753 persons, i.e., a decadal growth of about +30.57 percent. Table 3.2 shows the population growth of Shillong Urban Agglomeration from 1971 onwards.
Table 3.2: Population Growth of Shillong Urban Components (1971-2001)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipality</td>
<td>87659</td>
<td>109244</td>
<td>131719</td>
<td>132876</td>
<td>+24.62</td>
</tr>
<tr>
<td>Cantoment</td>
<td>4730</td>
<td>6620</td>
<td>11076</td>
<td>12385</td>
<td>+39.86</td>
</tr>
<tr>
<td>Nongthymmai</td>
<td>16103</td>
<td>21558</td>
<td>34209</td>
<td>38241</td>
<td>+33.86</td>
</tr>
<tr>
<td>Mawlai</td>
<td>12260</td>
<td>20405</td>
<td>30964</td>
<td>38241</td>
<td>+43.09</td>
</tr>
<tr>
<td>Madanrting</td>
<td>6165</td>
<td>8987</td>
<td>16700</td>
<td>20231</td>
<td>+45.77</td>
</tr>
<tr>
<td>Pynthorumkrah</td>
<td>10735</td>
<td>13682</td>
<td>22108</td>
<td>267881</td>
<td>+27.45</td>
</tr>
<tr>
<td>Nongmynsong</td>
<td>11362</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total UA</td>
<td>122752</td>
<td>174724</td>
<td>223366</td>
<td>267881</td>
<td>+42.34</td>
</tr>
</tbody>
</table>


Growth of the Population of Urban Units from 1971-2001

At the time of the creation of the state there were four urban units supporting a total population of 122752 persons in a geographical area of 21.27 sq km having a density of 5771 persons per sq km. (Table 3.4).
Table 3.3: Population, Area and Density of the Urban Components and Percentage of Population of each Component to the total Population of the Shillong Urban Agglomeration (1971-2001)

<table>
<thead>
<tr>
<th>Components</th>
<th>Year</th>
<th>Total population</th>
<th>Area in sq km</th>
<th>Density/sq km</th>
<th>% of population to the total population of SUA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipality</td>
<td>1971</td>
<td>87659</td>
<td>10.36</td>
<td>8461</td>
<td>71.41</td>
</tr>
<tr>
<td></td>
<td>1981</td>
<td>109244</td>
<td>&quot;</td>
<td>10,545</td>
<td>62.53</td>
</tr>
<tr>
<td></td>
<td>1991</td>
<td>131719</td>
<td>&quot;</td>
<td>12,714</td>
<td>58.97</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>132876</td>
<td>&quot;</td>
<td>12826</td>
<td>49.60</td>
</tr>
<tr>
<td>Cantonment</td>
<td>1971</td>
<td>4730</td>
<td>1.84</td>
<td>2570</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>1981</td>
<td>6620</td>
<td>&quot;</td>
<td>3598</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>1991</td>
<td>11076</td>
<td>&quot;</td>
<td>6020</td>
<td>4.96</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>12385</td>
<td>&quot;</td>
<td>6731</td>
<td>4.62</td>
</tr>
<tr>
<td>Mawlai</td>
<td>1971</td>
<td>14260</td>
<td>6.14</td>
<td>2322</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>1981</td>
<td>20405</td>
<td>&quot;</td>
<td>3323</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>1991</td>
<td>30964</td>
<td>&quot;</td>
<td>5043</td>
<td>14.86</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>38241</td>
<td>&quot;</td>
<td>6228</td>
<td>14.28</td>
</tr>
<tr>
<td>Nongthymmai</td>
<td>1971</td>
<td>16103</td>
<td>2.93</td>
<td>5496</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>1981</td>
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<td>&quot;</td>
<td>7358</td>
<td>12</td>
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<td></td>
<td>1991</td>
<td>26938</td>
<td>&quot;</td>
<td>9194</td>
<td>12.06</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>34205</td>
<td>&quot;</td>
<td>11675</td>
<td>12.77</td>
</tr>
<tr>
<td>Madanrting</td>
<td>1971</td>
<td>6165</td>
<td>2.11</td>
<td>2922</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>1981</td>
<td>8987</td>
<td>&quot;</td>
<td>4529</td>
<td>4.02</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>16700</td>
<td>&quot;</td>
<td>7915</td>
<td>6.23</td>
</tr>
<tr>
<td>Pynthorumkrah</td>
<td>1971</td>
<td>10711</td>
<td>2.02</td>
<td>5302</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>1991</td>
<td>13682</td>
<td>&quot;</td>
<td>6773</td>
<td>6.13</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>22108</td>
<td>&quot;</td>
<td>10477</td>
<td>8.25</td>
</tr>
<tr>
<td>Nongmynsong</td>
<td>2001</td>
<td>11362</td>
<td>N.A</td>
<td>N.A.</td>
<td>4.24</td>
</tr>
</tbody>
</table>

Share of population of the urban components to the total population of SUA -1971

Graph 3.3(a)

- Shillong municipality
- Shillong cantonment
- Mawlai
- Nongthymmai

Share of population of the urban components to the total the population of SUA-1981

Graph 3.3(b)

- Shillong municipality
- Shillong cantonment
- Mawlai
- Nongthymmai
- Madanrting
- Pynthurumkrhrh
The trend of occupying the steeper and forested slopes of the study area had already set in. Not much attention was paid to the unplanned nature of growth of the city. Water supply of the city was managed by the Shillong municipality which had its water source from the seven spring/stream sources located in the southern steep slopes of the study area.
The new townships of Nongthymmai and Mawlai (Fig 3.2) remain outside the jurisdiction of the Shillong Municipality till date. The populations living here have to manage their own waste disposal and water supply.

Analysis of the table 3.3 suggests that during the creation of the state

(i) The Shillong municipality having an area of 10.36 sq km. supporting about 87659 people i.e. 71.41 percent of the total population of the Shillong Urban Agglomeration, with a density of 8461 persons per sq km.

(ii) The cantonment having an area of about 1.84 sq km supporting a population of 4730 persons, i.e. approximately 4 percent of the total population of Shillong Urban Agglomeration with a density of about 2570 persons per sq km.

(iii) Mawlai Township situated on a moderately steep-to-steep slope is an integral part of the Shillong Urban Agglomeration with a total population of 14260 persons in an area of 14 sq km. This accounts for 12 percent of the total population of the Shillong Urban Agglomeration i.e. 2322 persons.

(iv) Nongthymmai an integral part of the Shillong Urban Agglomeration recorded a total population of 16103 persons in 1971 occupying a total geographical area of 2.93 sq km. This segment accounts for 13 percent of the total population of Shillong urban agglomeration with a density of 5496 persons per sq km.
SHILLONG URBAN AGGLOMERATION, 1971
(Total Area: 21.27 Sq. Km.)

Meters

0 1000 2000

Mawlai
Shillong
Municipality
Canttornment
Nongthymmai

Source: Census of India, 1971 Meghalaya Series-13

Fig. 3.2
The 1981 census recorded a population size of 174703 showing (Table 3.2) a decadal growth rate of about +42.32 percent. The resultant urban expansion of the Shillong Urban Agglomeration also grew in its size since two new urban components were added within the Shillong Urban Agglomeration namely Pynthorumkhrah and Madanrting (Fig 3.3).

The total area of the Shillong Urban agglomeration increased to 25.40 sq km. (from the previous census the total area under the Shillong Urban Agglomeration increased by 4.73 sq km.). It may be mentioned here that the township of Pynthorumkhrah on the Umkrah basin skirting the north-eastern part of the Shillong Urban Agglomeration is located at an elevation of 1400 meters above m.s.l. Unlike other township Shillong Urban Agglomeration does not have any organized civic bodies for systematic disposal of solid waste. Most of the residents here manage their own solid waste disposal and often the solid wastes are disposed directly into the streams. Shortage of water supply has been discussed in details in chapter IV.

The distribution of population of the different urban components recorded in the 1981 census is as follows (Table 3.2 & 3.3).

(i) The Shillong municipality with an area of 10.36 sq km recorded a population size of 109244 thereby showing an increase of +22.85 percent compared to the 1971 census. However the percentage of population to the total population of the Shillong Urban Agglomeration decreased by 8.87 percent in comparison to the 1971 census as the Shillong municipality had a share of about 62.53 percent of the total Urban Agglomeration population in 1981 census. This is
perhaps because of the growth of urban agglomeration. The density of population was 10545 persons per sq km with an increase of 2084 persons per sq km. and a decadal variation of +23.64 percent compared to 1971 census. Hence this component created further congestion in the city. The number of waste bins and cleaners engaged by the municipality remained unchanged even after the significant growth of urban population and area. There was no substantial increase in the solid waste disposal infrastructure to meet the needs of the extra population. The amount of water supply also remained the same, since the Municipal identified no new sources of water. However the Public Health Engineering Department of the Government of Meghalaya had come up with its plan of Greater Shillong Water Supply S Scheme in 1978, which was formulated to meet the water demand of the increasing population. Through this scheme the water supply of greater Shillong has improved significantly but still many areas are yet to be supplied under this scheme.

(ii) The cantonment having an area of 1.84 sq km recorded a population size of about 6620 persons with an increase of about 39.95 percent then the previous census. The density also increased by 40 percent from the previous census (3598 persons per sq km). However the percentage share of the cantonment population to the total population of the Shillong Urban Agglomeration remained at 4 percent.
SHILLONG URBAN AGGLOMERATION, 1981
Total area: 25.40 Sq. Km.

Source: Census of India 1981 Provisional Population Total Meghalaya Series-14
Fig. 3.3
(iii) The township of Mawlai having an area of about 6.14 sq km recorded a total population size of 20405 persons thereby with an increase of about 43 percent which is indeed very high in comparison to the rest of the urban components. The density recorded was 3323 persons per sq km. with an increase of +43.11 percent. At this stage the township has started showing signs of congestion and at the same time solid waste and water requirement has increased.

(iv) The township of Nongthymmai having an area of 2.93 sq km records a total population of 21558 persons in 1981 census thereby showing an increase of 33.88 percent. The density recorded was 7358 persons per sq km. The increase was to the tune of 34.37 percent. This is equivalent an absolute increase of 1862 persons per sq km. This highly dense township has no proper waste disposal and water supply.

(v) The new township Madanrting located towards the south east of Nongthymmai occupies an area of 2.11 sq km. with a population size of 6165 persons (density of 2922 persons per sq km in 1981 census). This new unit was declared urban in 1981 census and was included in the Shillong Urban Agglomeration. The township is located at an absolute relief of 1600-1800 m above mean sea level has a moderately steep to steep slopes. The main drainage line in this township is Wah Demthring which is highly polluted due to domestic and trade effluents. The wastes are directly disposed off to the streams. The township is also managing its own water supply, which are usually surface springs and streams.
The township of Pynthormumkhrah located at an absolute altitude of above 1400 meters having an average slope of moderate category is actually ideal for urban expansion. The township is located towards the north east of the Shillong Municipality recorded a total population of 10711 persons occupying a total geographical area of 2.02 sq km in 1981 census. The density recorded was 5302 persons per sq. km. The percentage share to the total population of the Shillong Urban Agglomeration of this township was 6 percent.

The 1991 census suggests that there was no increase of urban units but the population increase was 27.85 percent. Hence the urban areas became more congested leading to more problems of solid waste disposal and water supply as there is no additional infrastructure to meet the demands of the additional population. The total population in 1991 census was 223366 persons occupying an area of 25.40 sq km. (density of 8793 persons per sq km) (Table 3.4).

Table 3.4: Area, population density and decadal variation of population of Shillong Urban Agglomeration (1971-2001)

<table>
<thead>
<tr>
<th>S.No</th>
<th>Area (sq km)</th>
<th>Total population</th>
<th>Density/sq km</th>
<th>Decadal variation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>21.27</td>
<td>122752</td>
<td>5771</td>
<td>+42.32</td>
</tr>
<tr>
<td>1981</td>
<td>25.40</td>
<td>174703</td>
<td>6878</td>
<td>+27.85</td>
</tr>
<tr>
<td>1991</td>
<td>25.40</td>
<td>223366</td>
<td>8793</td>
<td>+19.93</td>
</tr>
<tr>
<td>2001</td>
<td>25.40</td>
<td>267881</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The distribution of population and density of the urban units, their percentage increase in population and the share of each urban unit to the total population of the Shillong Urban Agglomeration are:

(a) The Shillong Municipality occupies an area of 10.36 sq. km with a total population of 131719 persons which has an increase of 22475 persons (20.57 percent) in 1991. The share of this urban population was 58.97 percent to the total population of the Shillong Urban Agglomeration.

(b) The Shillong cantonment has a geographical area of 1.84 sq km with a total population of 11076 persons, with an absolute increase of 4456 persons. The decadal variation was +67.31 percent. This is indeed high in comparison to the growth rate of other urban components as well as the overall growth rate of 27.85 percent. Population density was 6020 persons per sq. km. with an increase of 2422 persons per sq km, which is about 67.32 percent, increase. This has resulted to further overcrowding of the cantonment especially the slum of Jhalupara. The percentage
share of this component to the total urban population in the 1991 census was 4.96 percent thereby showing an increase of 0.96 percent than the previous census.

(c) The township of Mawlai has a geographical area of 6.14 sq km with a total population of about 30964 persons. The absolute increase of population was to the tune of 10559 persons. The decadal variation was +51.75 percent. The township recorded a density of 5043 persons per sq km. The percentage share of this component to the total urban population was to the tune of 14.86 percent thereby showing an increase of 2.86 percent.

(d) The Nongthymmai town has a geographical area of 2.93 sq km with a total population of about 26938 persons with an absolute increase of about 5380 persons. This account for +24.96 percent of decadal variations, which is comparatively less in comparison of 1971-81 i.e. more than 30 percent. The share of population of Nongthymmai to the total population of Shillong Urban Agglomeration was 12.06 percent indicating a marginal increase of 0.06%. Infrastructure facilities like water supply and solid waste disposal never increased. The density per sq km increase was 1836 persons i.e. 24.95 percent increase.

(e) The township of Madanrting with the same geographical area recorded a population size of about 8987 persons with an absolute increase of about 2822 persons accounting for +45.77 percent. The density increased by 1337 persons per sq. km that is an increase of 45.76 percent. The density recorded in 1991 census was 4259 persons per sq km which was 2922 persons per sq km in 1981. This indicates that
population pressure on land led to deforestation as the urban sprawl increased to the steeper slopes and to the fragile areas which is not suitable for urban expansion.

(f) The township of Pynthorumkhrah with a geographical area of 2.02 sq. km recorded a population of about 13682 persons with an absolute increase of about 2971 persons (+27.74%). The population density recorded in this census was 6773 persons per sq. km i.e. an increase of 1471 persons per sq. km. This indicates about 27.74 percent increase.

(g) The recent census of 2001 recorded a total population of 267881 persons with a decadal variation of +19.93 percent. Thus the rate of population increase has a slower growth in comparison to the 1991 census, which had a decadal variation of +27.85 percent. Consequently the present census recorded about 7.92 percent less growth rate in comparison to the previous census. However the geographical area under the Shillong Urban Agglomeration has increased after the addition of Nongmynsong Township located towards the north east of Pynthorumkhrah (Fig 3.4). However, the geographical area under this township has not been recorded in the census record of Meghalaya. Hence the total geographical area under the Shillong Urban Agglomeration has increased but the data pertaining to the exact amount of increase is yet not available (Fig. 3.5).

The salient features that emerged from the above analyses of population of the Shillong Urban Agglomeration in 1971 census onwards are as follows.
SHILLONG URBAN AGGLOMERATION, 2001
Total area - 25 40+ Sq Km

Fig. 3.4
1. During the creation of Meghalaya the capital city of Shillong consisted of four urban units viz. The Shillong municipality, the Cantonment and the township of Mawlai towards the northwest and township of Nongthymmai towards the south east. (Fig 3.2) The total geographical area was 21.27 sq km supporting a population size of 122752 persons with a density of 5771 persons per sq km. (Table 3.4). It is seen that about 71.41 percent of the total population was supported by the Shillong municipality while about 25 percent of the total population lived in the two urban townships. The cantonment had a share of only 4 percent of the total population.

2. The 1981 census shows a population growth rate of +42.32 percent. Indicating a fast growth of the city. The geographical space of the city was 25.40 sq km thereby recording a total increase of 4.13sq km. The urban area expanded at the rate of 33.65 percent in 1981 census. The two new townships were included in this census year (Fig 3.3) and the density of population of the Shillong Urban Agglomeration was 6878 persons per sq km. The Municipality showed a relatively less growth rate of +22.85 percent. The township of Mawlai had the highest growth rate of + 43 percent. In fact it is observed that the urban units out side the municipality were supporting 65459 persons in a total area of 15.04 sq km. The municipality had 109244 persons in a total area of 10.36 sq km. Thus the urban units were expanding at a faster rate than the municipality as suggested by the growth rate of the other urban units. The urban units supported about 37.47 percent of the total population while the municipality had a share of 62.53 percent to the total population of Shillong Urban Agglomeration.
3. The 1991 census recorded a further stagnation on the growth of the Shillong municipality which had a decadal variation of only +20.57 percent. The urban units like the cantonments, decadal variation was +67.31 percent followed by Mawlai, at a growth rate of about +51.75 percent. The geographical area of the Shillong Urban Agglomeration did not increase, as no new units were included in this census year. The population recorded in this census was 223366 persons showing a decadal variation of +27.85 percent. The density recorded was 8793 persons per sq km with a total increase of 1951 persons per sq km i.e. increase of 27.84 percent per sq km. The urban units supported 91647 persons i.e. 41.02 percent of the total population while the municipality supported about 58.97 percent of the total population.

4. The 2001 census shows the inclusion of another new township to the Shillong Urban Agglomeration namely Nongmymsong. (fig.3.4). The decadal variation as seen is +19.93 percent as the total population recorded was 267881 persons. The urban units like Madanrting show a decadal variation of +86.02 percent followed by Pynthorumkhrah (+61.58 percent.). The municipality supports only 49.60 percent of the total population whereas the other urban units support a total population of 118305 persons that is about 44.16 percent of the total population of the Shillong Urban Agglomeration.

5. The above analyses indicate that the other urban components are growing at the expense of the Shillong Municipality. The Greater Shillong Water Supply Scheme is yet to cover such areas, but the present situation is such that the water is not enough to support the population within the municipality especially during the dry
season. Field investigation of Nongthymmai Township has been found that about 78 percent of the total population are dependent on their own source of water supply, which is owned by the local durbars. The water is not sufficient even in the rainy season. There is no planned waste disposal system and water supply to these new areas where 44.16 percent of the total population of Shillong resides.

6. To summarise one can say that the growth of population in Shillong Urban Agglomeration is mainly due to the high growth rate of the satellite townships located in the periphery of the municipality. The present trend of the growth of Municipality is more vertical than horizontal. The urban sprawl continues and is taking within its ambit the peripheral areas comprising of rugged terrain and escarpments.

References

3 Ibid. P. 258.
5 Ibid. P. 20.
6 Ibid. P. 22.
7 Ibid. P. 22.
9 Ibid. P. 341.
10 Ibid. P. 352.
12 Ibid.