Assymetrical Development and Urban Agglomeration Issues in Shillong

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Abstract

The expansion of the hill city of Shillong has sprawled into an urban agglomeration that lacks organised urban management with a population that is not as well served through development schemes as the core municipal area. Over the past few decades, growth in the Municipal area has gradually decreased as population density has overshot acceptable limits. At the same time, new Census towns have enlarged the urban agglomeration with some towns witnessing considerable growth. However, such growth has not been accompanied by an effective urban management structure which leads to asymmetrical development. The absence of a unified body to address urban planning and development in a holistic manner results in a scenario where limited urban development schemes are received in these towns. Considering the increasing urbanisation into the city and agglomeration area, a satellite township has been developed to decentralize important functions from the primate city and act as an exercise for decongestion. This measure requires balance however, as the inclusion of sprawling neighbourhoods will require an efficient public transport system and an adequate road network, compelling people to depend on motorized transport. Residents of these neighbourhoods would also have to spend more on transportation costs than those that live within the primate city. This leads to social isolation as people spend more time commuting than engaging in social interaction. It also causes health problems with a large increase in auto emissions also increase, which in turn causes threats to the environment in the form of global warming. Within the core city and urban agglomeration, a revamp of building regulations with an efficient use of land will help preserve open space and control urban sprawl. This can be achieved by increasing building footprints, especially for core commercial areas while retaining height restrictions.

Keywords: Urban Sprawl, Urban Agglomeration, Density, Urban Growth, Global Warming

INTRODUCTION

Indian cities have been undergoing rapid urban growth in the last few decades since our independence. Our urban fringes are evolving on a regular basis, at a time when basic services are still yet to be fully developed within our core cities. Such unplanned development that lacks infrastructural support is a threat to the future of our cities and citizens. The capital cities of Indian hill states in particular which are witnessing urban growth are facing distinct issues due to their terrain and inadequate infrastructural development. The hill towns in the state of Meghalaya are an example of this, particularly the state capital, Shillong. The past few decades have seen it expand through an urban sprawl which is largely sporadic and has resulted in a litany of problems that range from being exposed to hazards like manmade disasters to unregulated construction of buildings and considerable migration into congested urban areas.

Urban Sprawl can be defined as an uncontrolled expansion of cities from central urban areas into low-

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density areas. The spread of urban areas into rural area, forests and farmlands in particular influences the physical limits of cities. The economic potential of cities means that there is migration from rural to urban areas as people aim to secure better livelihoods and better standards of living. The resulting population expansion can only be accommodated through the physical growth of cities [1]. In the case of Shillong, this has resulted in the creation of numerous Census Towns around the city which form an urban agglomeration.

METHODOLOGY

It has become necessary to understand the sprawling of towns into urban agglomerations and the accompanying issues related to this process and question urban growth so that the future of our cities can be secured [2]. A holistic approach combining quantitative and qualitative aspects is essential and will include a comparative study of a few different hill towns across India [2]. This is to observe the causes, effects and nature of urban sprawl in these towns as there will be similarities due to the similar terrain and urban development background. Thereafter, the paper will look at urban sprawl in the Shillong Urban Agglomeration and also examine the infrastructure development and population density existing in different areas of the agglomeration. Relationships between institutional arrangements and the disparities in development between them will be analyzed. The existing regulations on urban development will also be assessed to see how sprawl is managed and whether decentralization through the introduction of a satellite township can be an effective management tool.

URBAN SPRAWL IN INDIAN HILL TOWNS

Urban sprawl and the issues related to it in the State capital cities of Shimla, Gangtok and Kohima will be investigated to observe the gamut of factors at play and to identify important observations.

As the capital city of Himachal Pradesh, Shimla is an important urban centre for administrative, educational and tourism functions. The concentration of functions has led it to be a primate city in the state of Himachal Pradesh and experiences considerable growth. The Shimla Planning Area was constituted in 1977 to control the future development and growth of the city. Despite this, ribbon development has occurred along major roads branching out from the city as the city core is already congested. Urban sprawl has also claimed the sloping areas of the city where direct access through road networks is impossible. Some of the out growths are constructed on slopes which are greater than 45 degrees which are prone to landslides and damage in an earthquake [4]. With an urban density of 7600 persons per sqkm and an estimated ninety percent (90%) of the city being built on such slopes, vulnerability is created as people cannot be tended to or evacuated in emergency scenarios. Inadequate planning has been identified as one of the major causes of the city's uncontrolled sprawl and suitable corrective measures will be required to solve the problems in the city [5].

The city of Kohima has experienced physical expansion over several decades. In 1975, the total built up area of the city was 4.83 sqkm which expanded to 11.42 sqkm by 2005, overshooting the present municipal boundary. Urban sprawl has manifested itself in all directions and the town has expanded for various reasons. Urban sprawling has taken place along the main road arteries and the high density of the core area has facilitated the creation of neighbourhoods along the periphery of the municipal area. The city features unplanned growth as a result and the hilly terrain has made it difficult to control the development of the city [6].

In 1951, the population of Gangtok was a mere 2744 and this figure has since then grown to 100286 in 2011. This represents a jump of 3554.73%. The rapid increase in urban growth in Gangtok is creating a demand for urban land to accommodate the additional population. This has resulted in the deforestation of forest areas and has witnessed the encroachment of the urban areas onto vacant land [7]. The urban sprawl that has taken over the city has been unregulated and there is little regard for building construction regulations. The augmentation and expansion of existing infrastructural

facilities and the implementation of development schemes in the city has created an additional thrust in urbanization. The migration of unemployed population into the city has created problems of congestion, housing shortages, water scarcity, etc. [8]

STUDY AREA

Since the British occupation, Shillong has become an important institutional centre with the presence of educational, medical and administrative institutions, some of which were set up during this period. Major schools of Meghalaya have been set up here and have drawn students from the entire North-Eastern region.
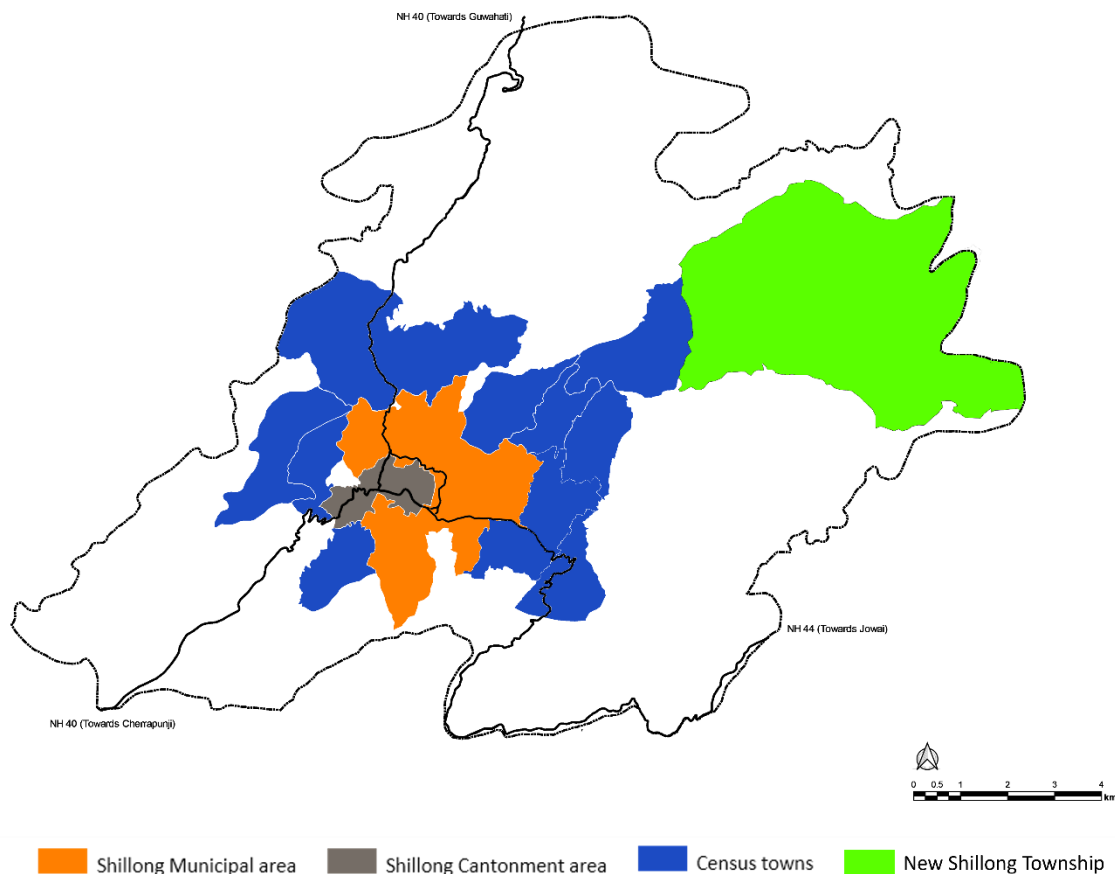
Figure 1. Map showing Greater Shillong Planning Area (GSPA) alongwith its constituent towns
(Source: Author)

There are also 29 colleges currently under the Directorate of Higher and Technical Education [9] and Central Institutions such as the North Eastern Hill University, Indian Institute of Management and National Institute of Technology amongst others. The major hospitals in the Greater Shillong Planning Area include NEIGRIHMS (North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences), Civil Hospital, Woodland Hospital, Dr. H. Gordon Roberts Hospital, etc. As the capital of the State of Meghalaya there are many crucial administrative bodies such as the Meghalaya Secretariat, High Court and the Meghalaya Legislative Assembly. Due to the establishment of these institutional functions over the past century, Shillong has witnessed substantial growth.

In this regard, this study is based on the Shillong Urban Agglomeration which includes the Shillong Municipal area, Shillong Cantonment area and 10 Census towns as shown in Figure 1.

SPRAWL AND GROWTH OF THE SHILLONG URBAN AGGLOMERATION

In the 1950s after India gained its Independence, the urban growth in Shillong Municipal area was characterized by migration from rural areas into localities with space for development such as Laban, Malki and Laitumkhrah. Gradually this led to an urban sprawl which resulted in the creation of new neighbourhoods beyond the Municipal area. The current towns of Mawlai and Nongthymmai began developing in this period and were considered part of an Urban Agglomeration by 1961 [10]. An Urban Agglomeration is a contiguous assembly of at least two urban centres with one being a statutory town and a population of more than 20,000 as of the 2001 Census [11]. To understand urban sprawl in Shillong since this period, the growth of the Municipal area will be examined first. The Shillong Municipal area covers an area of 10.36 sqkm and has been developing within this same area and boundary since its constitution. Table 1 indicates the decadal population growth and density of the Shillong Municipal area.

Table 1. Demographic statistics of the Shillong Municipal area from 1971-2011 (Source: Census of India)

Year	Population	% Decadal Growth	Area (sq km)	Density (person/sqkm)
1971	87659	21.01		8461
1981	109244	24.62		10543
1991	131719	20.57	10.36	12714
2001	132876	0.88		12826
2011	143229	7.79		13825

The decadal growth of population from 1971 to 1991 has exhibited an almost constant growth of more than twenty percent (20%). In this period, the density of population in the Municipal area has grown from 8461 persons per sqkm to 12714 persons per sqkm. Until 1971, the density within the Municipal area was within the figure of 6000-9000 persons per sqkm for Medium Hill Towns as suggested by the URDPFI Guidelines, 2014. Since 1981 however, this figure rises from 10543 persons per sqkm to 13825 persons per sqkm as of 2011. Considering an upper limit of 9000 persons per sqkm, the density in 2011 has overshot this by almost 54%. Within this time, the decadal growth rate has also slowed down to a mere 7.79% in 2011 [12]. The overshoot in density and decreased decadal growth rate is indicative that the efficiency and productivity of urban infrastructure and services within the Shillong Municipality are approaching an operative ceiling [13]. Such a scenario has fostered the overspill population to sprawl onto the neighbouring Census Towns.

Since the Shillong Urban Agglomeration (SUA) was formed in 1961, rural to urban migration as well as urban sprawl have contributed to the growth of the Census Towns (Figure 3) and the statistics associated with this are shown in Table 2.

The decadal growth rate of the towns has exhibited an upward trend in the past few decades. As is evident from Table 2 however, it is observed that once the density of a town overshoots a certain threshold, the decadal growth rate reduces drastically. The three towns of Nongthymmai, Pynthorumkhrah and Madanriting are amongst the oldest Census Towns in the Shillong Urban Agglomeration. Nongthymmai demonstrated an average decadal growth of 48.24% from 1971 to 1991. In the same period, the density rose from 4653 to 8947 persons per sqkm. Thereafter, the decadal growth figures decreased to 10.48% in 2001 and 11.09% in 2011. Similarly, the town of Pynthorumkhrah experienced a reduced decadal growth of 23.12% in 2011 from 61.58% in 2001, at which point its density was at 9396 persons per sqkm [12]. For the remaining towns in the Urban Agglomeration, where density is low and developable land is available, an accelerated decadal growth continues until the density reaches a threshold.

Table 2. Decadal growth rate and density of the Census towns in the Shillong Urban Agglomeration.

| Year	No of Census Towns in Shillong Urban Agglomeration	Population	Decadal Growth (%)	Area (sq km)	Density (persons per sqkm)
1971	2	30363		9.601	
	Nongthymmai	16103	67.21	3.461	4653
	Mawlai	14260	56.69	6.140	2322
1981	4	58839		14.200	
	Nongthymmai	21558	33.88	3.461	4653
	Mawlai	20405	43.09	6.140	2322
	Madanriting	6165		2.2460	2745
	Pynthorumkhrah	10711		2.353	4552
1991	4	80571		14.200	
	Nongthymmai	30964	43.63	3.461	8947
	Mawlai	26938	32.02	6.140	4387
	Madanriting	8987	45.77	2.2460	4001
	Pynthorumkhrah	13682	27.74	2.353	5815
2001	5	122620		15.690	
	Nongthymmai	34209	10.48	3.461	9884
	Mawlai	38241	41.96	6.140	6228
	Madanriting	16700	85.82	2.2460	7435
	Pynthorumkhrah	22108	61.58	2.353	9396
	Nongmynsong	11362		1.490	7626
2011	10	199600		77.31	
	Nongthymmai	38004	11.09	3.461	10981
	Mawlai	55012	43.86	6.140	8960
	Madanriting	29194	74.81	2.2460	12998
	Pynthorumkhrah	27219	23.12	2.353	11568
	Nongmynsong	15017	32.17	1.490	10079
	Mawpat	6184		8.250	750
	Umpling	8529		24.560	347
	Nongkseh	4846		12.360	392
	Umlyngka	7381		6.970	1059
	Lawsohtun	8214		9.480	866

(Source: Census of India)

Looking at Figure 2, it can be seen that the decadal growth rate of the towns reduces when the density is at approximately 10,500 persons per square kilometer. This corresponds to what is seen in the Municipal area where the decadal growth rate starts reducing from 1981-91 onwards when the density of the town was 10,543 persons per square kilometer. This figure seems to indicate the threshold density for towns in the Urban Agglomeration. This is reflected on the ground where the congestion is very high in these towns. Additional population in these towns have begun to migrate to the other Census towns and urban fringes where the density is lower. These are the areas where urban sprawl is evident and it appears that a positive growth in population creates urban sprawl. [7]

ASSYMETRICAL DEVELOPMENT ISSUES WITHIN THE SHILLONG URBAN AGGLOMERATION

The Meghalaya Urban Development Authority has been constituted to enforce the Master Plans for urban areas created under the provisions of the Meghalaya Town and Country Planning Act, 1973 and as amended thereafter. MUDA regulates the construction of buildings through the Meghalaya Building Bye Laws. The bye laws were amended in 2011 and published in the Official Gazette of Meghalaya through a notification on the 21st of July 2011 and the extent applies to all Master Plan areas and Scheme areas notified and to be notified from time to time as per the Section-A sub-section 1.2 of the Meghalaya Building Bye Laws, 2011[14]. However, objections from the Khasi Hills Autonomous District Council meant that the bye laws were to be exempted from being applicable beyond the Municipal area in the Shillong Urban Agglomeration and a notification to this effect was released on the 5th of November 2015. This has had an impact on the nature of urban sprawl that has occurred across SUA. Unregulated building construction which had been the norm in the Census

Towns continued unabated. Considering that Shillong lies in Seismic Zone V, it is imperative that urban development is pursued while taking into consideration the possibility of earthquakes and landslides.
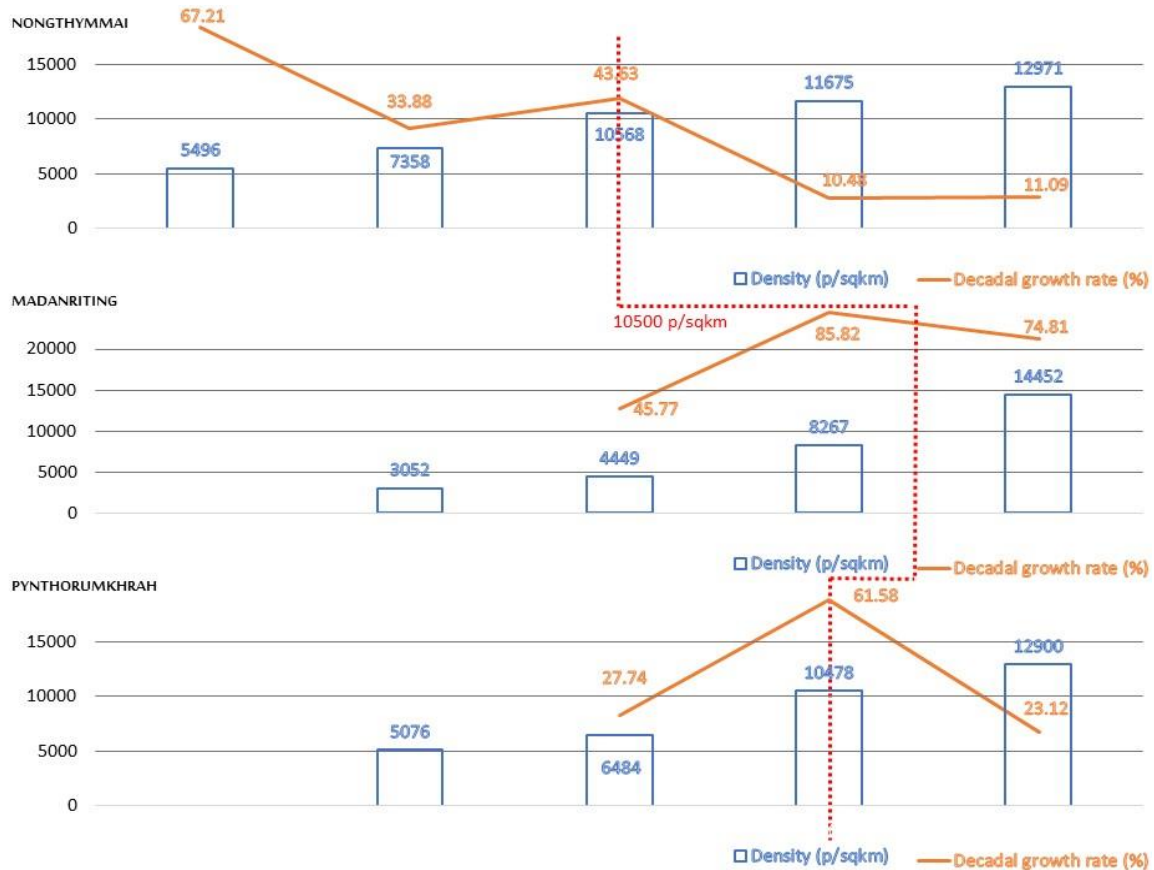
Figure 2. Decadal growth rate and density of Nongthymmai, Madanriting and Pynthorumkhrah.
(Source: Author)
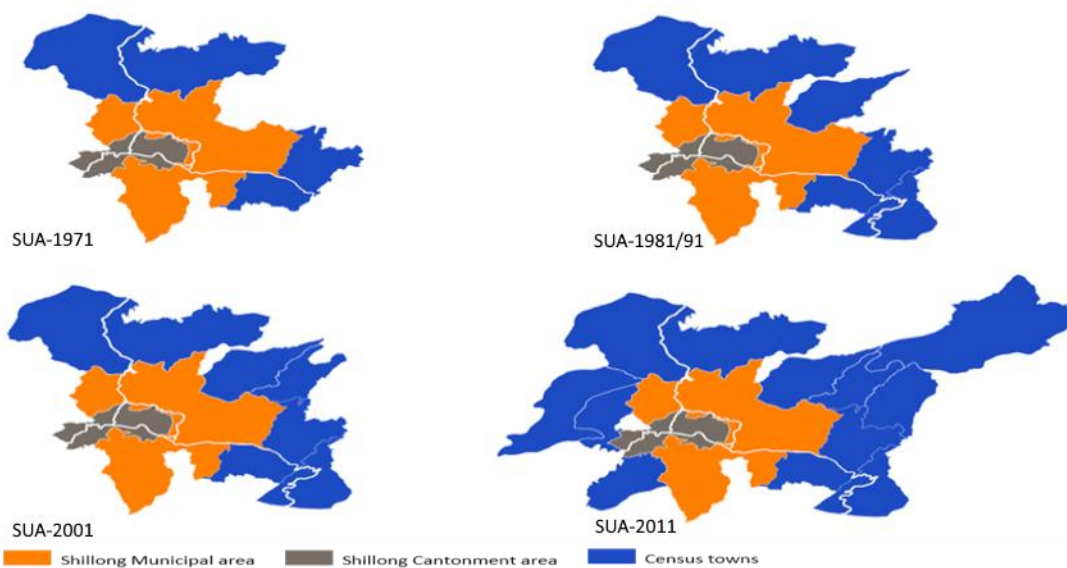
Figure 3. Evolution of the Shillong Urban Agglomeration (SUA).
(Source: Author) (Not to scale)

Furthermore, the presence of multiple urban governance institutions in the SUA including the several government line departments, Shillong Municipal Board, Meghalaya Urban Development Authority and the traditional local bodies or dorbars with only the Shillong Municipal area being a statutory town has resulted in a lopsided distribution of schemes and funds within the SUA. Urban sprawl has contributed to the establishment of the Census Towns which function without any statutory urban local body and do not receive the same degree of benefits as the Municipal area. The prominence of the traditional local institutions known as the "Dorbars" play an important role on the development of the Census Towns [15]. The urban development of the Municipal area is being pursued through the implementation of various development Schemes. The Centrally Sponsored Schemes being implemented in Shillong require the presence of a statutory urban local body which is a prerequisite as per the 74th Constitutional Amendment Act.

The Swachh Bharat Mission (Urban) is a national programme by the Ministry of Housing and Urban Affairs that is aimed to solve sanitation and solid waste management issues. It involves the construction of individual household, community and public toilets to eradicate open defecation. Solid Waste Management has become one of the primary areas that require in Indian cities due to increased generation of waste and a need to improve the overall system. An effective Solid Waste Management system usually includes segregation of waste at the household level, door to door collection, transportation and processing with disposal of the waste depending on the category of waste [16]. As such, the Mission is being implemented in all the statutory towns of Meghalaya. However, in the first meeting of the State High Powered Committee under SBM-Meghalaya, it was decided that the Census Towns of the Shillong Urban Agglomeration are to be included under the Mission through the involvement of the Deputy Commissioner. Table 3 shows the funds allocated to the SUA under the components of Individual Household Toilets (IHHL), Community Toilets (CT), Solid Waste Management (SWM), Public Awareness with IEC and Capacity Building for the period 2014-15. It categorizes the SUA as including the Shillong Municipal area, the Shillong Cantonment area and the ten Census Towns as one entity. The first two towns have dedicated ULBs in the form of the Shillong Municipal Board and the Shillong Cantonment Board to implement the components of the Mission. The Census Towns would be managed by the office of the Deputy Commissioner, East Khasi Hills District which is ill equipped to handle the technical aspects of the Mission. This is reflected in the quantum of funds allocated to the Census Towns where the per capita allocation is INR. 38.33/person which is smaller than the Shillong Cantonment area's figure of INR. 105.11/person and the Shillong Municipal area's area of INR. 196.88/person [17].

Table 3. Distribution of funds under the Swachh Bharat Mission (Urban) within the Shillong Urban Agglomeration for the period 2014-21. Figures are shown in lakhs of Rupees (INR).

SUA Towns	Implementing Bodies	Population 2011	Toilet Construction	Solid Waste Management	Public Awareness + IEC	Capacity Building	Total
Shillong Municipal area	Shillong Municipal Board	143229	26.61	215.77	36.57	3.04	281.99
Shillong Cantonment area	Shillong Cantonment Board	11930	4.57	6.75	0.97	0.25	12.54
10 Census Towns	Deputy Commissioner, East Khasi Hills District	199600	45.61	10.48	16.18	4.24	76.51

(Source: Urban Affairs Department, 2021).

The Atal Mission for Rejuvenation and Urban Transformation (AMRUT) Mission was launched to ensure that cities have improved and effective urban infrastructure. In Meghalaya, Shillong was selected as the only beneficiary city with implementation limited to the Municipal area. Under the

Mission, the works approved for Shillong includes Faecal Sludge and Septage Management for the city, a Septage Treatment plant and Construction of Green Spaces and Parks. Apart from the implementation of Central Sector Schemes to improve urban development, the construction of Commercial Infrastructure such as the Polo Market Redevelopment will be an added benefit which is exclusive to the citizens in the Municipal area [18].

Additionally, since the Census Towns are classified as urban areas, they do not receive any funds from the rural sector, particularly from the Community and Rural Development Department [19]. Thus, the sprawling of the settlement over the past few decades has led to a number of Census Towns being formed which demand considerable investment in urban infrastructure. The absence of ULBs however restricts the amount of development schemes available to them and urban sprawl itself, should be limited to provide control on the efficiency of urban services.

MANAGING SPRAWL THROUGH THE NEW SHILLONG TOWNSHIP

As seen in Figure 3, the most recent towns added to the Shillong Urban Agglomeration have been towards the North East direction. This is due to the favorable terrain in this direction as well as other factors. The urban agglomeration is bounded by several defence establishments towards the south east and south west with a steep range of hills on the south acting as a physical constraint. This also forms the unique visual background to the city. On the western side lies Barapani lake and a steep catchment which slopes down to the water body. The necessity to prevent any environmental risk and the nature of the terrain itself limits growth in this direction.

As discussed, Shillong has reached a high level of saturation in density due to urbanization over several decades. The provision of infrastructure and services cannot keep pace with the growth leading to overcrowding in the Municipal area and growth of slum-like conditions in pockets of the Census towns where adequate urban infrastructure is required and is further punctuated due to the absence of designated ULBs to manage urban development.

To manage the population growth, unregulated sprawl and the increase of non-statutory Census Towns in the Greater Shillong Planning Area, the Shillong Master Plan 1991-2015 was developed. As per the projections of the Master Plan, it was estimated that the population of Shillong by the year 2011 would be 4.93 lakhs. To tackle the growth in population of the Greater Shillong Planning Area, a new satellite township called the New Shillong Township was proposed [20]. The township was also envisioned to provide planned infrastructure and avoid the institutional issues present in the Census Towns to manage urban development, whereby projects for different urban sectors would be taken up by the respective line departments before the influx of considerable population makes it unviable. The proposed development took into consideration the integration and the distribution of productive forces and population recognizing the spatial and locational aspects of economic growth and desirable physical environment for the need and welfare of the population. The growth of the Shillong Urban Agglomeration and the Municipal area in particular was headed for stagnation and there was a need for decentralization of administrative functions and channelising investments of infrastructure to a new town which would promote the economic development of the area. Taking advantage of the climatic condition, I.T. based activities and services sector such as education, health centre etc. were prioritized including tourism & urban forestry. Within the New Shillong Township area, there are 6 habitat villages which have been integrated with the overall planning and development of New Town. The implementation of the New Shillong Township involves a controlled mechanism of urban sprawl to address various issues faced within the Shillong Urban Agglomeration [21].

The provision of a new satellite township involves the setting up of infrastructural facilities. Presently, the allotment of land to various public-sector organizations in crucial sectors has been completed to promote development of the township and henceforth the provision of infrastructure will become a top priority. For provision of infrastructure, there is an urgent need to develop the road

network, water supply, sewerage, drainage and power network in the township. The financing options to achieve this include the public sector, private sector or development through a public-private partnership. A sole government funding would be ideal in case there is a land bank available with the Government. However, mobilization of considerable capital Investment becomes a constraint and also acceptability of people is low. Private sector investment would be difficult in the present scenario due to the absence of a competent regional private firm to take up the matter. Meghalaya also has a unique land tenure system which makes becomes a deterrent for private sector investment. [22] The development of housing colonies would be driven by market forces and hence housing for LIG/EWS groups can be marginalised. A PPP mode is desirable from the point of view of policy makers as the control mechanism would be with the government which would act as a facilitator. This attracts private sector investment in Housing & Commercial sectors while protecting the interests of the marginalised groups. The risk factor for the private investor would also be perceptibly lower.

While the township aims to manage or control urban sprawl, the process itself also brings demerits. When urban centres become large with the inclusion of low-density sprawling neighbourhoods, they will require an efficient public transport system and an adequate road network, compelling people to depend on motorized transport. Residents of these neighbourhoods would also have to spend more on transportation costs than those that live within the primate city. This leads to social isolation as people spend more time commuting than engaging in social interaction. It also causes health problems such as obesity and asthma. Auto emissions also increase, which in turn causes threats to the environment in the form of global warming. [23] [24] Considering the incidences of manmade disasters that have taken place such as urban flooding along Wah Umkhrah in Polo area and landslides in certain localities, an increase in hard paved areas in the township may lead to higher incidences of flooding and erosion. There will also be a loss of valuable open green spaces and forest areas which will aggravate this further. [25] [26]

DISCUSSION

As the only primate city in the state of Meghalaya, India, Shillong's growth is unparalleled and has enabled its Urban Agglomeration to breach the acceptable limits in urban density. Evidently, the constituent towns of the Urban Agglomeration demonstrate a reduced intensity in population growth rate as urban density crosses the figure of 10,500 persons per square kilometer. This threshold is much higher than the standards set by the URDPFI Guidelines, 2014. At the same time, to accommodate the increased migration, urban sprawl transforms the area of the Urban Agglomeration and the lack of a common mechanism to provide equitable urban services in all areas of the agglomeration results in asymmetrical development.

CONCLUSION

Considering the gamut of issues at play, multiple interventions can be explored that may become statutory solutions in the future. To streamline the multiplicity of governance institutions operating in the SUA, a unified urban development structure is required for the urban management to arrive at a holistic development vision of the city of Shillong which considers all the stakeholders who provide and manage urban services. This may help to ensure an inclusive mode of development for all the ten towns present in the SUA. With the Census Towns displaying high growth rate and urban densities, the prevailing building regulations may be examined to better manage this. Considering the concentration of improvement schemes for infrastructure in the Municipal area, a high-density mode of regulated development would be promoted to preserve the remaining green open spaces. The maximum utilization of land can be achieved by increasing the FAR and ground coverage provisions especially for core commercial areas while retaining the height restrictions. This was subsequently addressed in the Meghalaya Building Bye Laws, 2021. The integration of development policies within the framework of the next Master Plan of Shillong can help propagate this vision further. Restricting urban sprawl may also be achieved by levying certain charges on the conversion of valuable open space to alternative uses to maintain the quantum of green zones available within the urban boundary.

While such alternatives to urban sprawl may not seem to be immediately attractive, they may be the solutions that will help us create an urban environment that is sustainable. Furthermore, in an effort to provide sustainability within the notified urban areas and to reduce the dependency on city infrastructure, provision of low cost and passive green technologies should be promoted such as the use of solar power and wind energy. A comprehensive investigation into these aspects can further help provide specific measures which are tailor made for the socio-economic and geographical context of Shillong.

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