CHAPTER - II
HISTORY AND GEOGRAPHICAL SETTING OF THE STUDY AREA

2.1. Location of the Study Area:

The Greater Guwahati covers an area of 354 sq.km lies on both banks of the Brahmaputra river. It lies between latitudinal extension : 26°5’N and 26°12’ N and longitudinal extension : 91°34’E and 91°51’E.

The study area is bounded by Khashi and Jayantia hills on the south. On the west the city is bounded by Palasbari plain, on the north of the eastern part by the river Brahmaputra and on the east by the hills and plains of Chandrapur area. The study area is situated on a flat plain interrupted by small hillocks rising upto a height of 300 m and large number of wetlands and low lying areas. In regional context it could be said as the gateway of the Northeast for its locational advantages. (Fig. 2.1)

Occupying a unique location at the bank of the mighty river Brahmaputra, the city possesses beautiful hills and hillocks, river island and sandy chars. But in recent years due to the high rate of population growth, all these beautiful features are being degraded and the city as a whole polluted in such a way that environmental condition of the city to a great extent becomes unhygienic for the city dwellers.
2.2. History and Political Background of the Guwahati city:

"The name forms an important mark of identification by which a person or thing is known. It is unique distinguished feature of an object like any other place names an onym is an identification tag, which gives insight to the past." (Phukan, 2003) So it is very important to look towards the history of a particular city to get to the underlying fact that contributed to make the present status of the city. Before going to study about the problems of Guwahati city it was felt necessary to study about the historical background of it.

Guwahati, the capital of the state of Assam, is also the entry point for the whole northeastern region. It is the only metropolitan city in the entire region with a population of over 12 lakhs. It is also a commercial and political hub of entire North East. The city has a rich historical past. It is universally accepted that Guwahati is an ancient city that had been the seat of government for a long period. But historical fact about Guwahati beyond this period known for its identity in the land of great antiquity. Assam as well as Guwahati did not have properly maintained historical records of ancient time. However the ‘Ahom’ were good recorder of history and hence historical sources are plenty at least from the beginning of the ‘Ahom’ rule. For study of history about pre ‘Ahom’ period, information had to be collect from various archeological finds and Hindu and Buddhist mythologies. Guwahati city finds frequent mention in medieval historical sources as one of the key administrative unit. Still, back in time, the city was known as Pragjyotishpur (the light of eastern quarters), which finds mention in Mahabharata, Ramayana and Raghuvansha of Kalidas. Regarding the origin of the name of the city different opinions are found in the works of different scholars.
Fig. 2.1. Location map of the Study Area
(Source: Maps and Toposheets)
According to Dr. B.K. Kakoty (1967)² formerly Brhma used to create stars staying here; hence city was called ‘Pragjyotisha’ and the city of eastern astrology and astronomy. Probably this name was known from the age of ‘Rigveda’.

According to some historians the name stood for the kingdom for the country also. It may be mentioned that the name has a non-Aryan origin. It seems to be connected with topographical features of the land. In ‘Bhagawata Puran’ it was mentioned as inaccessible by reasons of wall fortification, water, fire and wind. The topographical features of ‘Pragjyotishpur’ as described by ‘Purana’ would correspond to a formation like ‘Pragor-juh(jo)-tic’ a region of extensive high hill. The name ‘Pragjyotisha’ was used in the inscriptions of the 12th and 13th century also. But the exact time of replacement of this name by the present name of Guwahati is not known. Yet it is found that 15th century onward the name Guwahati was used in different chronicles and epigraph. Most probably at that time the city was full of betel nut trees, wrapped with pan creepers that is why the city got the name of Guwahati. The word ‘Guwa’ means ‘Tamol’ or betel nut has most probably come from the ‘Sanskrit’ word ‘Guvaka’, ‘hati’ means row or line. Gauhati is the anglicized form of Guwahati.(Phukon, 2003)³.

Kamrupa was the name even to the kingdom, which ultimately came to be known as Assam. In the later Vedic period, according to ‘Joginitantra’ the kingdom of Kamrup comprise the whole Brahmaputra together with Rongpur, Cochbihar, Manipur, Jayantia, Cachar, part of Mymensing and Sillhet of present Bangladesh.
Famous Chinese traveler Huen Sang visited the city in 640 B.C. According to his testimony Ka-mo-ho-po (Kamrupa) the extension of the kingdom was about 10000 li and the capital was about 30 li. The name of Kamrup was derived from the name of Kamdeva who was said to have regained his life in original form (rupa) in this region. (Acharyya, 1996).

In the 13th century when the Shans from Burma conquered Kamrupa, the word Asom or Axom was first applied to it. The word later also came to be used to mean the territory ruled by the community.

From the above description it can be said that Guwahati was a place of fame from the ancient times and it has been a center of astronomical, astrological, religious and educational activities with immense strategic and political importance. But Guwahati was not always the capital city; from time to time capital of the kingdom was shifted to other places also. When the British took over the state, Captain Jenking had make Guwahati the head quarters of the province. In 1836, the British had established a town improvement committee in Guwahati, and right from this time the growth of modern Guwahati did started.

The history of Guwahati goes back to the legendary period. References of the area can be found in the Mahabharata, the Puranas and in many Tantras. In the Kalika Purana it is recorded that the temple of Kamakhya was in the center of Kamrupa region. It is mentioned in the Vishnu Purana that the country extended around Kamakhya temple in all directions over hundred yojanas. There is specific mention of the region of Kamrupa in Garuda purana, Bishnu purana, Yogini Trantra, Maha Neel Tantra and other Trantras. Kalidas mentioned both Pragjyotish and Kamrupa in his epic Raghubansham.
At that time Kumar Bhaskar Varma was on the thorn of Kamrupa. Huen Sang observed more than one hundred Hindu temples but none of the Buddha Viharas or Sangharams. He found the animals scarifies in Hindu temples. Being devout Buddhist, Huen Sang was not happy to see any of the residents to observe Buddhist doctrines. It was however not exactly known when the image of Lord was engraved at Janardan Hill close to Panbazar area.

In one of Assam Buranji there is reference that there were 17 Buddha Kings like Jayanta Chukrapal, Bhumipal etc. One hundred years after the death of Vaskar Varma, Shalstambha become the king of Kamrupa. He was succeeded by Shalamabha. His dynasty ruled over a period of two hundred years. The last king of Shalamabha dynasty was Tyag Singha. He died in the early part of eleventh century. After his death, his relative, Brahmapal became the ruler and established his capital at Durjaya which is believed to be in present Guwahati. Last ruler in the Brahmapal dynasty was Dharampal who regained his power during the earlier part of twelfth century.

According to the latest Buranji, Kamrupa was invaded by Koach King Viswarup and reigned from 1498 to 1508. His worthy son Naranarayana was the most powerful King of the Koach dynasty. He ruled the area during the period from 1534 to 1584 AD. He wanted an alliance with the Mugal Emperor Akbar and parted with a portion of Assam valley. That portion came under the muslim rule. However, in 1654 the Ahom raja Jayadwaj Singh drove away the muslim ruler and occupied the area. The unfortunate town of Guwahati continued to be the spirit of contending power of the Ahoms and Muslims. Finally at 1681 it was recaptured by the Ahom King till the middle of the 18th century when the Maharastrian insurrections broke out. As a result the normal way of life and
cultivation of land was suspended and no harvest could be reaped. Ultimately famine broke out and took a heavy toll of lives in this area.

It was the period when the British power was expanding in the rest of India. In 1824 the British declared war against the Burmese. In the following year i.e. in 1825 Assam was ceded to the East India Company and a separate province under a chief commissioner was created. The head quarters of the new administration was shifted from Guwahati to Shillong.

The present name of Guwahati was known in the past as ‘Pragiyotishpur’. According to Edward Gait (1963) the word ‘Prag’ means ‘eastern’, ‘Jyotish’ means ‘astrology’, ‘Pur’ means town or place. i.e. the city situated on the east famous for astronomical and astrological studies. It might have derived its name from the ‘Nabagraha’ temple situated on the top of chitrachal hill where the observatory was once erected and where the temple dedicated to nine planets.

As mentioned above the present name Guwahati has been derived from betel nut market, it is still found to be the place of betel nut selling center panbazar, fancy bazaar area, though there is a sea change in infrastructure in the entire city particularly in the recent years.

2.3. Physical Setting:

2.3.1. Physiography:

The situation of Guwahati is extremely picturesque. To its north rolls the mighty river Brahmaputra, the south west and the eastern sides are surrounded
by rows of semi-circular hillocks. The cardinal points of Guwahati are 26°10' north latitude and 91°49' east longitude.

A careful analysis of the topography reveals that the Guwahati area can be divided into six well-defined natural divisions. The river Brahmaputra, Guwahati plain, Central hill ranges, Beltola plain, Jalukbari-Azara plain and North Guwahati Azara plain. The old city lies in a horse shoe shaped Guwahati plain surrounded on the north by the river Brahmaputra and by Kharghuli and Chunchali hills in the east (maximum height 216m), Japorigog, Fatasil and Nilachal hills on the south and the famous Kamakhya hill on the west (maximum height 303m). The average elevation of this plain is about 52m. from the mean sea level, though there are many high lands as well as low lying pockets within this area (Sharma, 2001) (Fig. 2.2).

Although the hills are not suitable to develop as built up areas, due to their rocky surface and steep slopes, yet in recent years some of these hills have converted into residential areas, which have created some environmental problems particularly extensive soil erosion in these hill slopes. Bounded by this hilly range on the north, Khasi and Jayantia hill range on the south and east and Fatasil hill on the west lies the Beltola plain extending 15km from north east to south west. With an average width of about 4 km this is the only potential areas for future development of the Guwahati city. The capital at Dispur is also located in the Beltola plain further to the west of the city lies the Jalukbari Azara plain where the Deepor beel and its adjoining low lying areas are located. The North Guwahati-Amingaon area on the north of the Brahmaputra are situated on a flat plain interrupted by some small hillocks, which made the riverbank stable. The Agyathuri
Figure: 2.2 Relief map of Guwahati (Source: Prepared by researcher)
hills situated on the western boundary of this plain rises to a height of about 300 m. There are also many low-lying areas and beels in this region.

It has been also been stated earlier that the major portion 243.2 sq. km. (95 sq. mile) of the greater Guwahati area is situated on the southern bank of the mighty river Brahmaputra only 23 sq. km. (9 sq. mile) being on the northern bank. The southern bank of river rises up from an average ground elevation of 51.3 meter (168 ft) and excepting in certain central and the western portion of the area. The hill ranges of Kharghuli and Nabagraha rise to a maximum height of 216 meter (712 ft) in the eastern portion and Nilachal Hill rise to a maximum of 303 meter (960 ft) in the central portion. Then it falls down to a valley having an average ground level of 49 meter (135 ft) after which it gradually rises again to Khasi and Jayantia Hills to a maximum elevation of 575 meter (1866 ft) which constitutes the southern boundary of the city. In the east, the area slope down from a hill range having a general elevation of 182 meter (600 ft) to a valley having an elevation of 49 meter (160 ft). Inside the area there are 1) Fatasil range (elevation average 358 meter) and 2) Sarania Hills (250 meter). In between the Hills again there are pockets of low laying areas with an elevation of 49 meter (160 ft) on an average.

2.3.2. Climate:

Situated at a latitude of 26° 10' north the climate of Guwahati is more or less moderate with temperature variation between minimum average in winter and maximum average in summer limited to around 20°C. It is outside the tropical area by about 4° north of the tropic of cancer. The principal characteristics are a cold and foggy winter, moderately hot spring and temperately hot but very humid
The monsoon is rather long extending from May to September. Though
most of the rainfall occurs during the monsoon, occasional heavy downpour is
often experienced during winter also.

The climate of Guwahati is tropical in nature, which can broadly be divided
into three distinct seasons; summer, monsoon and winter. The factors, which
affect the climatic condition are—
a) Its latitude, which is 26° 10’ North,( Slightly above the latitude of topic of
concern)
b) Its location between the Himalayas and the Bay of Bengal,
c) Its contiguous location with the Meghalaya plateau.

The chief characteristic of the climate of Guwahati can be
divided into four categories such as—
a) The cold and foggy winter from November to February,
b) A warm spring,
c) A fairly hot and humid summer,
d) A moderate rainfall.

The climate of Guwahati maintains close similarity with the rest of the
Brahmaputra valley. Here the temperature is neither too high nor too low. Usually
the hottest day occurs in the month of August, when the temperature shoots up
to 37° C. Due to the presence of moisture the winter temperature does not drop
down very much.

The city experiences fluctuation of yearly temperature, which results in
the blow of winds. In winter, mild wind blow from northeast to southwest. During
summer wind blows from southwest to northeast. During this period storms including hailstorms also occur in the city. During the month of March, the winds blowing from southwest carry enough dry sands from the sand bars of Brahmaputra, making the atmosphere of the city highly dusty.

The monsoon rain comes heavily during the months from May to August. But compared to the other parts of the region the rainfall is seen to be very low due to its location on the leeward side of the Meghalaya plateau. One of the most striking features of Guwahati is its humidity. The entire northeastern area is known for its humid climate and Guwahati is probably one of the most humid regions of the country. Its average monthly humidity ranges from 60 per cent to 90 per cent and some times the maximum humidity reaches up to 100 per cent.

2.3.3. Drainage and Water Bodies:

The natural drainage system of Guwahati is primarily dependent on the river Brahmaputra which is flowing across the city in East West direction. The perennial natural streams, which flow across the city, are Vasistha, Bharalu, Bonda in the south bank and Ghoramara in the north bank. Some swamps and wetlands of the city like Silsako beel, Sala beel, Deepar beel etc also help in receiving the water of the summer down pour and contribute to the overall drainage system.

To get a fair idea about the flow of water we may mention the elevation of certain strategic points of the city. The benchmark recorded by GSI near the DC Court in the heart of the city is 49 meter. The benchmark of Guwahati railway station about a km south of DC's court is 52 meter. Thus the flow of natural water is not uniform.
The highest summer rainfall is witness in the city during the period from May to October. The highest single day rainfall is recorded 126 mm, while the highest total rainfall of a month is about 520 mm. Except for the heavy downpour, which occur only occasionally the natural drainage system generally help in draining out the rain water (Hazarika, 2001).7

The Bharalu river, which originates from Basistha in the south, flows in a meandering course across the city, carries most of the water of the urban area. This tributary of Brahmaputra runs from southeast to northeast. It meets the Brahmaputra at Bharalumukh, which is almost the central part of the city (Kaushik, 2004).8

In hilly areas of the city there are numerous streams flowing along narrow valleys, which are linked to the main natural streams mentioned above. The southern streams merge with the low laying alluvial tracts and held regular drainage while the northward streams invariably merges with the river Brahmaputra.

2.3.4. Soil Geology and Ground Water:

There is hardly any area within the Greater Guwahati Metropolitan District where there is any alluvium deposit. Recent finding in Ambari area by the Archaeological Department that civilization did exist in the vicinity as early as the second century AD. There is more or less contentious layer of igneous rock all through the area. The depression of this rock layer has constituted the valley area and its outcrops are the hillock.
There are distinctly two geological formations in the alluvial plain of Brahmaputra, which are interrupted by inselbergs formed by the Precambrian gneiss and schist. The alluvial plains also include the marshy tracts, which comprises the southwestern portion of Guwahati. The valley fill areas consist of clay, silt and sandy clay, sands and gravels. The basement topography is likely to be very much irregular in nature. As indicated by the numerous Achaean inliers projecting above the general land surface as hillock scattered around the city.

The aquifers at depth of 18.6 m. Therefore water tapped in alluvial fill areas through shallow tube wells. However, the yield from the shallow tube well is not significant. Possibilities of extracting ground water in considerable quantity is remote in hard rock areas. Water in hard rock formations occurs in joints, cracks and crevices and in the water shed zone the recharged water often comes out as springs at elevated heights.

2.3.5. Vegetation:

Falling in monsoon region, Guwahati has full growth of natural vegetation. Except rainfall, the vegetation of the region is nurtured by soil, physiography and hydrology of the area. The vegetations are generally deciduous in nature including the heavy growth of herbs, shrubs, climbers, algae, fungi, bryophyta, pteridothyta and gymnosperm etc. Though the denudation of the forest cover has attain a critical stage due to ever expanding human settlement, patches of natural and planted forests can be seen within the greater Guwahati area, which have most valuable timber trees as well as fruit bearing trees. A wave of exotic trees are also seen in an increasing way under the scheme of social forestry of Forest department.
For the analysis, the vegetation has been considered under three categories of crown cover density, namely - <10 per cent low density vegetation, 10-40 per cent medium density vegetation and above 40 per cent high density vegetation.

2.4. Cultural setting:

2.4.1. Population and Settlement:

At present the Guwahati city is having a population of nearly 12 lakhs, which is increasing by leaps and bounds every year. To save these land locked city from the probable chaotic condition in the years to come, some tangible measures like shifting these population pressure to the adjoining areas must be worked out (Dhiren Baruah, 2009).9

It is observed from the transportation survey that besides the normal population housed in the city, there is floating population of about 10 per cent, which use to come to Guwahati everyday for daytime activities. The economic sector is the main anchor behind the progress and growth of any city region. Guwahati has becomes one of the major hub of economic activities in the entire Northeast India. The establishment of Guwahati refinery in 1962, mark the beginning of industrialisation in the city. The construction of Saraighat bridge, shifting of capital from Shillong to Guwahati and establishment of tea auction center in Dispur have geared up the process of increasing population in the city area.

The growth rate of population in Guwahati GMA and GMCA areas is much more than the country average and state and district average figures (Table 2.1 and figure 2.3). Similar in the case of decadel growth of number of population (Table. 2.2 and figure 2.4).
Table 2.1. Population Growth (in percent)

<table>
<thead>
<tr>
<th>Name</th>
<th>1971</th>
<th>1991</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>-</td>
<td>24.25</td>
<td>21.35</td>
</tr>
<tr>
<td>Assam</td>
<td>-</td>
<td>23.8</td>
<td>18.85</td>
</tr>
<tr>
<td>Kamrup</td>
<td>-</td>
<td>28.73</td>
<td>25.75</td>
</tr>
<tr>
<td>GMA</td>
<td>-</td>
<td>48.73</td>
<td>37.86</td>
</tr>
<tr>
<td>GMCA</td>
<td>-</td>
<td>117.27</td>
<td>38.6</td>
</tr>
</tbody>
</table>

Note: No Census was carried out during 1981

Source: Various Issues of the Census of India

Figure: 2.3. Decadal growth rate

Table 2.2. Number of Population (in Lakh)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>548.15</td>
<td>846.3</td>
<td>1027.01</td>
</tr>
<tr>
<td>Assam</td>
<td>14.63</td>
<td>22.41</td>
<td>26.64</td>
</tr>
<tr>
<td>Kamrup</td>
<td>1.21</td>
<td>2</td>
<td>2.62</td>
</tr>
<tr>
<td>GMA</td>
<td>0.29</td>
<td>0.65</td>
<td>0.89</td>
</tr>
<tr>
<td>GMCA</td>
<td>0.12</td>
<td>0.58</td>
<td>0.81</td>
</tr>
</tbody>
</table>

Source: Various Issues of the Census of India

Figure: 2.4. Number of population
2.4.2. Transport and Communication:

Guwahati is linked with whole of Assam as well as with the rest of the country by roadways, railways and airways. It is also linked with eastern part of Assam by waterways. Moreover city Guwahati is directly concerned in other nations like Thiland, through Guwahati-Bankok international airways. Therefore, Guwahati is called the gateway of Assam as well as Northeast India, because one can go to any place of the region through Guwahati. (Fig. 2.5)

Until a few decade ago there were no modern means of transport in Guwahati. The advent of road transport in modern Guwahati elsewhere in India have developed during the British period. The process was running in the city from 1942 only. The first city bus was placed on the road on Guwahati in the month of April, 1947(Sharma, 2005)\textsuperscript{10}.

As per the report of the district transport office as many as 2 lakh 48 thousand motor vehicles were registered in Guwahati till 2004. On the other hand 29291 numbers of motor vehicle of different types were registered only in the year of 2008-09\textsuperscript{11}. As estimated by an organization as many as four lakh motor vehicle pleyed on the roads of Guwahati everyday. The rate of the increase of the vehicles and the rate of road length increase does not match at all for which city dwellers are facing many problems.
Figure. 2.5. Road network map of Guwahati
(Source: Prepared by researcher)
2.4.3. Industry:

The unit that are used for carrying out any manufacturing process are called industries. According to Land use report prepared by ARSAC 2002, around 7.64 sq km of the city area is covered by industrial area, where there located three different types of industries i.e. heavy -1.25 sq km, medium - 0.86 sq km, and light - 3.05 sq km.

From the last part of the twenty century the industries are established in the northern bank of the river Brahmaputra and southern part of the city that is the adjacent part of the express high way, from Jalukbari to khanapara. Many of the steel plants, house hold good manufacturing industries, cement factories, biscuit factories etc. are located in this industrial belt. Some old industries, which were located in the central places of Guwahati are now shifted to this newly emerged industrial belts. But the processes of distribution of industries are still unsystematic. Large industries like oil refinery, LPG bottling plant, some cement industries, and some highly polluting industries are located in the high density zone like Noonmati, Khanapara, Kalapahar, Basistha, Beltola, Fatasil Ambari etc. which led to the various problems of the city.

2.4.4. Education:

Education is the backbone of a society. It determines any kind of human activities and level of thinking of the people. The literacy rate of Assam was 53.78 per cent in 2001, which is lower then the all India average 65.37 per cent. On the other hand the literacy rate of Kamrup district is 74.69 per cent in 2001 registering an increase of 9.65 per cent over the 1991 figure (65.04%). GMCA registered around 9 percent in literacy rate between 1991 and 2001, which may
be attributed to the transformation of socio-cultural importance of education in the society and the growing government emphasis on education (CDP Guwahati, 2006).  

At present there are 388 primary schools and 101 secondary and higher secondary schools including degree colleges with XI and XII in Guwahati. On the other hand there are 18 higher education institutions including Cotton College, Guwahati Medical College and Hospital, Assam Engineering College, Gauhati University and Indian Institute of Technology. In addition, there are three polytechnics in Guwahati. Except these a large number of private educational institutions are established in the city area from pre primary level to Master degree level and formal education to some advance professional and IT based education.

2.4.5. Occupation:

The main occupation of the people of Guwahati is trade and commerce and service. Almost all the major government head offices of Northeast India located at Guwahati beside the state head offices. All these employee thousands of people. Many educational institutions both private and government sector also provide employment. This way a large section of working population of the city accommodate in service sector.

As Guwahati is the heart of trade and commerce of entire Northeast India many people have employed in this sector. Moreover, industries also employ a small section of working population of Guwahati.
2.4.6. Amenities:

Among the major amenities hospital and nursing homes, educational institutions, water supply are give priority in the list. Including a medical college large number of government hospital and large number of nursing homes are there in the city.

In education sector, medical college, engineering college, universities and many general and professional colleges and research centre have been developed for which students from different corners of the country get attracted.

Deficit of drinking water is one of the major problems in the city. As many as five numbers of water treatment plant are their and a few are coming up. In spite of that more then 50 per cent of people are still deprive of getting supply water. Most of the people in the city now depend upon ground water sources using wells and tube wells.

Apart from these, for children education a few museums, a planetarium and cultural centres have been developed in the city in the recent years.
2 B.K. Kakoti (1948), The Mother Goddess Kamakhya, Guwahati, p.6
4 Acharyya, N.N. (1996), A Brief History of Assam, Omsons Publications, Jasomantra Road, Panbazar, Guwahati.
8 Sandeep Kaushik (2004), Environmental problems of Guwahati and its impact on city Life, Unpublished project report, pp. 23
11 Statistical Hand Book (2009), Assam, pp 216.
12 City Development Plan Guwahati, 2006