CHAPTER - I
INTRODUCTION

1.1. Statement of the problem:

The history of urban growth indicates that urban areas are the most dynamic places on the earth’s surface. Despite their regional importance urban growth has a considerable impact on the surrounding ecosystem. Human use of land has altered the structure and functioning of the ecosystem. Urban land use has been increasingly changing in different forms since urban explosion of the 1970s. People move to cities en-masse from the rural hinterland to the cities in anticipation of getting benefits from an urban economy.

The most spatially and economically important human use of land globally includes cultivation in various ways, construction, reserves, protected lands and timber extraction. It is not only necessary to understand the changed process in cities, the understanding of the agent of change or beneficiary of change can be an useful indicator in planning and declaration of objective functions in cities.

Recently settlements and sprawl development are becoming large active land use changes especially in the developing regions of the world. The pattern of land use can provide us insight into the factors that have caused the land cover to change. The urban population in Africa is growing faster than any other continent. It is predicted that by 2030 about 5 billion people, approximately the population size of the entire continent today, will be in urban areas and that these figures will be absorbed by the urban areas of the less developed region.
The relationships between population increase, economic development and land use change have generated research interest since two decades and half ago. The influx of people into the cities complicated the urban condition through structural growth. The population increase naturally created adjustment and readjustment of human and land use activities in space within urban systems thus causing lateral and structural changes. Lateral changes occur when the city expands in geographic boundaries leading to sprawl and peripheral developments while structural growth relates to increase in land use density within urban centers. The low-density areas gradually become subjected to intensive use and thus become high density or medium density use.

Human alterations on the terrestrial surface of the earth are unprecedented in their pace, magnitude and spatial reach, of these, none are more important than changes in land cover and land use. It is important that the human elements of the land use land cover change be considered to provide a measure of the potentials of human as changed agents of land use land cover.

The United Nations Center for Human Settlements UNCHS observed that sustainable development is an integral component of human settlement development and gives full consideration to the needs and requirement of achieving economic growth and development, social development, social progress employment opportunities that are in harmony with the environment.

According to Clawson (1961), land use refers to man’s activities on land, which are directly related to the land. The term land cover relates to the type of land feature present on the earth’s surface. On the other hand, use of specific type of land cover refers to land use.
According to Burley (1965), land cover denotes the vegetational and artificial constructions covering the land surface.

Guwahati, the capital city of Assam is situated on the south bank of the river Brahmaputra. The Greater Guwahati area is the study area that extends beyond the mighty river Brahmaputra in the north and surrounded other three sides by hills and narrow valleys, most of the hills are the extension of the Meghalaya plateau.

The study area consists of three broad ecological units viz. the hills, plains and the wetlands. Compared to many of the Indian cities, Guwahati is fast growing in respect of its population increase. On the other hand necessary infrastructure is not increased at the same pace. As a result many inconvenience arise not only for the city dwellers but also for the city users. Such inconvenience are traffic congestion, water logging, noise pollution, air pollution, water pollution, ugly look of the city etc.

All the three ecological units are affected in different ways. The plain area, which was the place of early settlers, became over crowded. Hill slopes are badly disturbed particularly due to terracing for construction of dwelling units. Wetlands and low lying areas have been encroached for different purposes and many of them have been filled up for constructing public, semi public and individual houses. Moreover, wetlands have been over exploited and littoral areas littered for dumping solid waste of different kinds. Constructions and industrial activities also cause squeezing of the wetland and the low lying areas. Land value has been shooting up in recent years. As a result the whole scenario of the city changed within a very short period of time. It became an acute problem of Guwahati, particularly after the shifting of capital from Shillong to Dispur.
With the sprawling of the Guwahati city, peripheral areas are being adversely affected from environmental point of view. This trend of change in the area brought many changes in the socio-economic conditions of the people. Age old traditions, customs and social activities have been changing at a very fast rate. It is well reflected in the changing house types, space utilization, energy use, occupation, economy, education, household equipments, public and private transport, health, community life etc. One of the most significant indicators of modernization is 'urbanization', but this urbanization is again associated with environmental changes, more specifically environmental degradation. Guwahati, the gateway of Northeast India has experienced rapid urbanization in the last three decades leading to creation of many problems. The haphazard urban sprawling and rapidly increasing population along with industrial activities resulted in the land use pattern being so unsystematic that in some areas, commercial establishments and industries lie interspersed with residential area. This obviously becomes the threat to the human health of the city dwellers. So, before getting life it is the time to think and study thoroughly about such problems and to take necessary measures to prevent all sorts of inconveniences that already exist and are likely to crop up in near future.

As we all know, the components of environment are not only highly complex and dynamic, but also interdependent, reactive and interrelated with human being including all organisms. If any of the component changed due to certain activities it affects the whole environment. But on the development activities some of the components of environment altered or changed as it is seen in land use change in urban areas. As both the development and quality environment are equally important for us it is of umpteen need at this moment to look for sustainable development, which keep balance between the development and environment. Keeping this in mind the following objectives for the study have been taken up.
1.2. Objectives of the study:

The main objectives of the study lie on

(i) to study the expansion pattern of Guwahati, particularly after shifting of the capital from Shillong.

(ii) to study the change of land use that has taken place in Guwahati in the recent past.

(iii) to study the nature of environmental problems faced by the city dwellers as well as the users of the city.

(iv) to observe the changes in socio-economic aspects of the people of Guwahati in respect of the use of household equipments, occupation, education, energy, health, public life etc.

(v) to find out the causes of the environmental changes.

(vi) to find out the impact of such changes.

(vii) to highlight the prospect for improvement of overall environment in Guwahati.

1.3. Methodology:

The geographical area of greater Guwahati that has been brought under study is not very large but the socio-economic and environmental aspects considered are intertwined in such a complex form that simple methodology could not be adopted to achieve the goal.

As all the data relevant to the study are not readily available in the secondary sources, some primary data have been collected to achieve the objective of the study.
The steps in the methodology adopted for the study are:

i) A base map of the study area has been prepared with the help of topographical maps Nos. 78 N/12 NE, 78 N/12 SE, 78 N/16 NW and 78 N/16 SW. of Survey of India, corresponding satellite imageries and incorporation of various secondary data available in departmental maps and reports.

ii) As the environmental quality of a place largely depend on its location peculiarity, physical and climatic condition, biotic environment and human activities, the relevant data particularly air, water and noise pollution data have been presented in the study using various maps, diagrams and data charts.

iii) Moreover, for suitable presentation and comparison, the study area has been divided into four zones. The relevant data in all four zones have been collected, interoperated and compared for better understanding of the situation which have been presented in the flow chart (Figure 1.1).

iv) The land use change is the prime theme of the study. Therefore, land use change has been studied using maps of urban land use of different years.
The changes of different land use categories clearly indicate the overall environmental changes in the study area. As such, the rate of change has been tried to be measured using statistical techniques. The analysis of the maps and various diagrams has been done to prove the hypothesis developed in the study.

1.4. Significance of the study:

The study aims at discussing some of the basic issues related to urban life, particularly in the city of Guwahati. Environmental change is an obvious phenomenon in all the cities not only in India but also all over the world. Undoubtedly, it is due to the growth of the city and continuous addition of infrastructures. But the impact of such changes in urban environment may not be same in all urban places. It mainly depend on the location, physical setting, economy, culture and tradition of the urban places. As Guwahati is
different in many respects from other Indian cities, the study on environmental problems and transformation of socio-economic life needs significant attention. The study mainly emphasizes on these issues and other associated features. As such the study carries enormous academic significance.

Secondly, for solving many of the urban problems, particularly the problems related to environmental quality of the city, the outcome of the study may help in decision making process and as such it will carry practical utilities also.

1.5. Hypothesis:

The hypothesis developed in investigating the land use and environmental issues in Guwahati are as follows:

(i) Guwahati is expanding very fast for its locational peculiarity and secondly due to shifting of capital from Shillong.

(ii) Most of the environmental problems have arisen in the city due to physical barriers, which restrict the horizontal expansion as bounded by river Brahmaputra in the north, Meghalaya plateau in the south and the hills and wet lands in other two sides.

(iii) Many of the inconvenience arise due to fast growth of population notwithstanding the growth of urban amenities.

(iv) Population growth in the city cause drastic change in physical and cultural environment.

(v) Lack of awareness of the people in general and unplanned development of infrastructure are responsible for many of the environmental problems.
1.6. Review of the related literature:

A review work of related literature always compel a researcher to acquaint himself/herself with current knowledge. A research can never be done in isolation. The works that have already been done on similar problems directly or indirectly help to study the topic proposed by a researcher. A careful review of the research journals, books, dissertations, thesis and other sources of information on the problem to be done is one of the important steps in the planning of any research study. This provide evidence that the researcher is familiar with the present status of the study areas and eliminates the risk of duplication of what has been done.

Nowadays, literature on land use studies have become voluminous and newer and newer literatures on different brands are gradually emerging. Therefore, it is difficult to provide a comprehensive review of works in this very extensive and rapidly developing field. The pertinent publications are found in variety of academic journals and survey reports. For that reason, it is quite impossible to incorporate all these in this review.

The Geographers and scholars of different fields have long been devoted to the study of the problems of land use in different countries of the world with a view to find out existing problems and potentialities. The study of land use is as old as agriculture itself. It is interesting that most of the studies on land use were related to agricultural activities.

The revolutionary model developed by Von Thunen (1826) on differential rent of land and agricultural location on a scientific basis, depicted with a concentric series of agricultural zones around a central market.

In the USA, Baker (1923) and in China, Lossing Buck (1937) contributed towards the dynamic studies of land use. But the real development in this direction started with the establishment of British Land use Survey in 1930 under the Directorship of Stamp. The British Land use survey department created a good impact on the country by solving the agrarian problems during the First World War. This gave impetus to the geographers to establish a commission on the World wide land use survey at the International Geographical Congress held in Lisbon in the year 1949 under the chairmanship of Valkenburg. This survey proposed a scheme for the delineation of land use classification on a uniform scale for all the countries of the World (Stamp 1949). Again the eighteenth conference of the IGU, held at Rio-de-Janerio (1956) recommended to set up a commission under the chairmanship of Stamp to organise a land use survey in all parts of the World.

The food and agricultural organization of the United Nations collects land use data from all of its member countries and published these data annually in its production year book. These include data on the total land area, arable area, permanent pasture, woodland and areas given to other uses in each country. Firth, Redfield Wolf, Padilla and Rees also contributed towards agricultural land use in their respecting study areas. Grigg (1969) dealt with many of the concept dealing with agricultural regionalization and


Gregor (1970) has reviewed and commented on a large number of important contributions to the general themes in agricultural geography. During the decades of sixties and seventies geographers made several conceptual, methodological and thought provoking studies, which strengthened the theoretical base of agricultural geography.

Many works have been done in emergence of urban land use. Leopold in 1962, studied on land use and sediment yield in the content of man's role in changing the face of the Earth. Nicholson (1972), has authored the book entitled, “The environmental evolution and analysis of the land use problems in different environment”, in which the land use have been elaborately explained. A comprehensive land use survey of England and Wales has been conducted by Miss A. Coleman (1962). No uniform classification scheme followed in urban land use neither by individuals nor by organizations in any part of the world. Gallion and Eisner had observed the changes in the urban character influenced by the physical structure. They revealed certain use and then categorized as agricultural, commercial, residential and industrial.

A significant contribution on land use was made by Berry and Horton (1969). They categorized urban land use into residential, retail business, transport and communication, industrial, wholesale, storage, public building and open spaces and vacant on non urban in Chicago city.

Gregor, H.F., (1970), Geography of Agriculture: themes in research, Prentice Hall, INC, NG.
Nicholson (1972), “The environmental evolution and analysis of the land use problems in different environment”.
Berry, J.L. Brain, Horton E. Frank (1969), Geographic Perspective in urban system. Hyder Park, Chicago, p 5-12
Collins (1995) in a study analysed the land use pattern in a very systematic way. He categorized the land use pattern of Britain as residential open space, public building and institution, industry, commerce, statutory undertaking, vacant and derelict building.

The great scholars like E.W. Burgess (1925), H. Hoyt (1939) and Ullman and Harris (1945) presented their concept of urban land use on the basis of their study of the structure of different land uses. Burgess’s model suggests that any urban area tend to expand radially from its central commercial core to the outer peripheral so as to form a series of concentric zones. His study was based on American city Chicago. Hoyt’s land use model says that city expands along a line of transportation roads to form a star shaped city. It is a modification over concentric zone theory since both distanced and direction from the city center are taken into account. Ullman and Harris (1945) developed multiple nuclei theory propounded by Mekenzie. Jackson (1968) was concerned with the existing distribution and structure of land use and the trend of land use and development.

Hoyt, Homer (1939), the structure and growth of residential neighbourhood in American cities Washington D.C.
Ullman, E.L. and Harris, C.O.(1945), the nature of cities, the annals of the American Academy of political and Social Science, Vol - 242, p - 7-17.
Jackson N. John, (1968), Survey for Town and Country Planning, Hutchinson University library, London p106-129
Symons, made the land use on the basis of land capability for planned agricultural development. His study was based on a system of land classification in Northern Ireland.

Berry (1959) explained his dissatisfaction on operation of land use in both local and regional level within the changing framework of facts and concepts. His assessment was based on the alternative urban future for a more desirable general welfare.

G. Putman, J. Taylor and G.P. Kettle (1970), provided a wide range of ideas about different levels of urbanization. They basically have dealt with locational characteristics of city, its economic bases and functions of central business districts and cities and hinterlands in U.S.A.

E. Smailes (1970), gave importance on the morphological emergence and growth of towns and discussed the problems of their classification and ranking in detail together with location and development, the variation of internal geography of various western cities according to their size and function.

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Symons L. J. Land use and land potential, Agricultural geography Edited by Buchanan R. O.; Bell and Hyman Limited London. P 224-245.

Berry, J. L. (1959), Land use, Urban form of Environmental Quality, p-321.


Haddon (1971) analysed the function of town, its growth through technique of personal survey and used the land use typology on an experimental basis for the city of Bristol, Bournemouth, Weston – Super Mare, Brad Ford and Avon Falmouth etc.

A comprehensive study of the problems created by the population growth, which are responsible for the unmanageable spread of cities has been done by Colin (1980). He gave a special treatment on land use and population growth of London, Chicago, Sun Francisco and Stockholm city of the western world.

The approach of Gerners for land use study in a city region was based on the Von-Thunian Model in a modified form. There is no uniform classification of urban land use, adopted by individuals and organisation in different parts of the world. It is because of differential land use in urban areas and also difficulties in mapping of various spaces. It also varies because of the differences in the purpose for which they are mapped. There is no spatial relationship between land use of Indian urban areas and those of the western countries. The highly mixed land use of urban areas in India differs markedly from the usual segregated land use in Anglo American cities.


The U.S. Geological Survey's (USGS) Urban Dynamic Research (UDR) programs studies the landscape that result from the growth of metropolitan regions over time. O. Fabiyi Oluseyi (2006) studied about urban land use change analysis of a traditional city from remote sensing data. The case study of Ibadan Metropolitan area, Nigeria, and found socio-economic changes in Nigerian cities are translated into block and mortal in form of physical development. The development at the peripheries are not significantly different from the types of housing on the core areas and transition zone, which reflect low economic growth and high involvement of the informal sector in housing supply during this epoch.

The Geographer of India have long been attracted to study the problems of land use in the country with a view to find out ways and means for scientific utilisation of land. Recently the land use studies give stress on the application of quantitative techniques in the analysis of various land use components.

Chatterjee (1952) has tried to find out the ideal land use pattern after studying the nature of utilisation each holding in Howrah district.

USGS (Science for a changing world) fact sheet 188 –199, Analyzing land use change in urban environments, November.


R.L. Singh's (1955) study is based on the problems dealing with structure, process and stages of development of cities. He has worked with various aspects of urban settlement and land use of the city of Benaras. S.B. Goswami (1960) highlighted the influence of physical environment on agricultural land use in a typical village near Ranchi. Misra (1964) studied the land use planning for better adjustment of agriculture to the physical environment for optimum exploitation and conservation of natural resources in the Khader riverine tract of lower middle Gomati valley. Singh (1965), studied the land use of canal irrigated area of Patna district.

Alam and Khan (1965) gave a philosophical thought on the urban evolution leading to the segregation of different uses of land to unfold the varied cultural and economic forces and complicated historical events which influence the growth and structure of Hyderabad and Secanderabad twin city. He applies concentric zone theory and sector theory in the analysis of urban morphology of the cities.

Singh’s, R.L. (1955), Benaras A study in urban geography, Nanda Kishore & bros Publication, Benaras, India.
V. Singh’s (1966) in his study on the growth and development of Allahabad city includes the evolution of townscape, geographical zones, demographic structure with different functional character and changes in land use pattern. He also attempted to delimit the land use.

Roy (1967) has attempted an analysis of crop association and spatio temporal change in the crop pattern as well as general land use in the Gnaga-Ghagra Doab east and pointed out the pressure of population on land.

K.V. Tyagi (1967), analysed clearly that the expansion of Delhi city and its suburban areas gradually consuming the agricultural land on their periphery where the rural neighbouring villages surrender their agricultural land to the expanding city area. Siddique’s (1968) land use survey of the black soil of Bundelkhand was based basically on agricultural production. He has assessed the influence of physical economic and social condition on the evolution of cropping pattern.

N.P. Ayyar (1969) has contributed a study on methodology for finding out the crop association in Madhya Pradesh. Recently the geographer of N.E. India have studied

the general and agricultural land use pattern in different parts of Assam. These studies are mainly tropical and regional.

Alam(1970) has carried out his works on Hyderabad. He identified the zone of influence with the pattern of land use development and functional nodes for the integrated rural urban complex. He examined the general land use pattern and evaluated the developmental trends of residential, commercial and industrial land use in order to suggest a policy for urban land use development in the city of Hyderabad.

Shafi (1972) has selected Ganga-Yamuna Doab of UP for intensive study of crop land pattern and changes in the average of major crop. His other study range from inventories of land use surveys to isolated tropical or regional account of spatio temporal variations of land use.

Noor Mohamad(1973) attempted a study concerning the various changes in agricultural and general land use pattern of a small village ‘Misranlia’ during a period of twenty years. Das (1973) made his study on the agricultural land use in Dehradun.

Chatterjee and Jana (1973) have studied the pattern of land utilisation in an around temple oriented Tarkaswar town in Bhubaneswar. Singh studied the land use of canal irrigated area of Patna district. Biswas (1974) made an extensive survey of Ishakpur village to find out the changes in economic and land use pattern of the village during a period of 40 years. Siddique (1974) attempted another study of land use pattern in agricultural predominated Ganga-Ghagra Doab region and necessity of a change in cropping pattern to get maximum yield from the land.

K. Bagchi and Jana (1974) made a study on spatial pattern of land utilisation and crop combination in the lower Silabati basin of West Bengal. Singh (1976) deals with the changing nature of agricultural production of Harriana. Pathak, Sing and Tripathi analysed the land use pattern of small town Jutni and tries to provide a future layout of urban land use.

Latest land use/land cover map for Lucknow and its environment was prepared from IRS-1B imagery of 1992. The area falling under each major category land use was calculated with the help of Ushikata Palar Planimeter. For analysis purpose all the maps

Chatterjee, S. and Jana M.M., (1973), The pattern of land utilization in and around Tarakeswar town, West Bengal, Geographical Review of India vol 37, No.1, March.
were primarily drown at 1:50000 scale and were later reduced photographically to bring them in presentable form.

R.C. Staragi and PPS Pundir (1997), Map Division, O/o Registrar General and Census Commissioner, New Delhi, Department of Geography, D.B.S. College Dehradun.

After identification and delineation an accuracy test was made for 150 sample points on topographical sheets. Out of the 150 samples points 133 points were found to be correctly interpreted giving an accuracy of about 90 per cent.

According to land use/land cover map of 1992 of the Lucknow city and its surrounding area, which cover an area about 620 Sq. km, around 9 per cent under high density built up urban areas and 8.08 per cent and 12.96 per cent under medium density and less density areas respectively. 12.09 per cent of land was falls under the wasteland category whereas only 0.95 per cent and 0.20 per cent of total lands use ware used as recreational and transportation purposes.

H.P. Samant and V. ubramanyam, (1998), had done GIS application by the researchers. The IDRISI ver. 4.0 a grid based GIS package was used for the digitizing and data analysis. The resolution of all the data used was 30 m. so as to match the spatial resolution of the satellite data.

Staragi, R.C. and Pundir, P.P.S.(1997), Use of Satellite data in urban sprawl and land use studies: A case of Lucknow city, PHOTONIRVACHAK: ISSN-0255-660X
PHOTONIRVACHAK, Vol. 25 No.2.
After detail study of Mumbai they found that drastic reduction of about 55 per cent in the forest/agricultural land has taken place while a 300 per cent increase in built-up land. The wetland too shows a reduction by 23 per cent. It can be seen that the area under built-up land in some basins is a high as 50 per cent while the stream length effect of built-up land on stream length is as high as 40 per cent. It is also evident that higher order streams were affected the most. The drastic changes within a drainage basin affects the channel parameters. The large per cent of impervious cover due to urban land use in the form of buildings and roads reduces the infiltration capacity in a basin causing proportional increase in the amount of surface runoff. Environmental changes resulting from human activity like land reclamation, deforestation and quarrying in a metropolitan city like Mumbai and the neighboring Navi Mumbai area have led to problems like monsoonal flooding.

For preparation of map, remote sensing data were used. They also used “SOI TOPOSHEETs, SOI guide map and Census of India publication, town directory etc to carry out their research work.

Based on the information which could be obtained from imageries, nine major land use/land cover categories were identified which were further sub divided into a total of 27 sub classes. Each class and sub class has got its own definition for this analysis.
According to Ajit Bora 1980, there is no denying the fact that the nature plays an important role in shaping an environment of different communities. Topography and terrain, existence of river, lakes and marshes and the climatic condition also influence land utilization pattern. Similarly cultural and social institutions also have their impact on the evaluating land use pattern. Population pressure and demand for food and fiber, wood and timber and other produce of the land also bringing about changes in land utilization pattern. According to Bora there are some basic and important factors that are associated with land use in the state and problems associated with them, those problems are – natural, socio-economic and technological. For optional use of land, besides a set of data on land utilization pattern, other important types of statistical information will be necessary. Maintenance of actual and accurate records and cooperation among various departments of the state Government particularly, department of Agriculture, Economics, Statistics, Soil conservation, Forest, Irrigation and Embankment, Public work department, Embankment and drainage, Flood Control etc, are vital, keeping in view of the better use of land resources in the state. For planning of land utilization, there should be a complete study of land capability and complete soil map of different classes of land. It has emerged from the present pattern of land utilisations based on blind forces of nature and society. To rectify the haphazard use, attempts should be made to have a complete picture of land resources of the state.

Bora, Ajit Kumar (1980), Pattern of Land Utilisation in Assam, Ph. D. Thesis.
Bhattacharya (1981) has investigated the associated pattern of land use and building type in a urban landscape of Assam with special reference to Guwahati city. Das (1984) observed the agricultural land use pattern in Assam giving more emphasis on the land building structure crop combination and agricultural industries. L. Dutta (1985) in her doctoral dissertation has discussed various aspects of agricultural land occupancy of Nagoan district of Assam. She systematically analysed the physical and socio economic problems of agriculture and explored the possibilities of future development. Das and Dutta (1986) has analysed the relationship between the physiographic condition and agricultural land use in Northeast India keeping aside other geographical aspect.

Geeta Devee (1989) had studied about the changing pattern of land use in the Borpeta District of Assam and gave emphasis population pressur on agricultural land. Sharma (1990) in one of his studies explained the need of an integrated land use planning in relation to urbanization, village expansion, road and communication development etc. in N.E. India as there is no strict safeguard to stop unplanned transformation of the land.

Das, M.M. and Dutta, L., (1986), Regional Variation in Landuse and Agricultur in NE India, N.E. Geographer, Vol. 18, No I and II.
Thakur, A. & Goswami, D.C., (1991), Land use mapping and monitoring urban changes of Ghy city based on spat – 1, HRV satellite data, p- 2.


S. Deka (2002) in his doctoral dissertation has discussed various aspects of evaluation and management of wastelands in Kamrup District of Assam. He said that the wastelands of Kamrup District has been badly affected by human interference and unsystematic use.

D.J. Saikia (2004) tried to correlate the changes of population distribution and change in land use particularly after 1971 and found commercial areas on the left bank of Kallong River.

On the basis of the study they had classified land use as: built up land (inclusive of roads and rails), airport area, reclaimed areas, open space, vacant lands, mudflats (inclusive of mangroves, marshy areas) water bodies (lakes, streams, rivers, creeks), vegetation (inclusive of forests, if any), hills, quarries, sand etc. It was observed that and use cover change increase specially in built up area which was 13 sq. km. in 1966 increased to 32 sq. km. in 2005.

1.7. Organization of the study:

Whole study is divided into seven different chapters. The first chapter is the introduction chapter in which statement of the problems, objectives, methodology, significance, hypothesis, review of related literature and organization of the study are there. The second chapter consists of history and geographical setting, which is again subdivided into three sub units i.e. history and political background of the city, physical and cultural settings. Under physical setting physiography, climate, drainage and water bodies, soil and under ground water and flora and flora are included. On the other hand under the cultural setting population and settlement, transport and communication, industry, education, occupation and amenities are highlighted.

The third chapter, land use pattern and nature of change includes the land use category and change study methodology, spatial and temporal change, pattern of land use change and cause of land use change.

In the fourth chapter, land use change and environmental problems where different types of problems like problems in wet lands, the hills, in the residential areas, water logging, traffic related problem and some pollution related problems are analysed. Pollution are like land pollution, water pollution, air pollution, and noise pollution.

In the fifth chapter, an attempt has been made to study the relationship between environmental change and human health. Living environment in slums and hill settlement are analysed here. Disease like water borne, airborne and mental stress get importance in this chapter.
Sixth chapter consists of environmental change and socio-economic issues, where environment and education, environment and occupation, awareness on land use and environment, land use change and impact on economy, land use change and impact on socio-cultural life and remedial measures are highlighted.

Seventh chapter summary and conclusion chapter not only sums up the study but also possible suggestions are highlighted and concluded the whole work.

1 Fabiyi Oluseyi O. (2006), Urban land use Change Analysis of Traditional City from Remote Sensing Data; A Case Study of Ibadan Metropolitan area. 


4 Burley,C. (1965), Land use changes on USDA Photograph, American Society of *Photogramatry, pp - 42.*