CHAPTER 1

INTRODUCTION

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INTRODUCTION

1.1 Introduction

Landscape change and the role of man in changing the face of the earth have been a constant theme in geographic writings across the centuries. George, P. Marsh (1874) drew attention of man's continuous indulgence with the environment in modifying them to suit his convenience. This modification has been facilitated by modern techniques of measurement and monitoring. There is concern over the change, academically, where the harmful effects of human interventions, on environmental quality, has created a convergence of the discipline.

Urban centre is an integrated system of man and environment. The urban centre has both natural and artificial factors. Here both are modified according to the population of the area. The urban centre may also be thought of functionally, as an open eco-system for maintaining urban culture. These functions require workers, transport system and resources, supplying and absorbing hinterland. Thus, the city (urban centre) is an integrated system of man and environment. It is not possible to isolate or separate completely the elements and process, within the urban environment (Detwyler 1972).
Urbanization is the process of city establishment and growth. The term commonly connotes population increase in the city, resulting from both internal growth and immigration, as well as spatial expansion of the city. The population growth and spatial growth go hand in hand because both kind of growth, importantly affect and are affected by environment. To a large extent the environmental ills are caused by the demands, functions and growth of cities. In recent years converging focus of population, urbanization, technology and environment have come into serious conflict. At a time when man's control over nature is apparently increasing, each new day brings fresh evidence of his potential, to create havoc and make the world less livable.

Urbanization has become an important generator of economic growth and social change. This is the gratifying aspect of urbanization. However, the disquieting aspect is that, the immense growth has resulted in a worst of urban problems, over crowding, crime, unemployment, social tensions, declining quality of urban life to potential spread of disease and the threat to health, from noise. In short, there is a complete degradation of man's physical and social environment, (Eastman and Penz 1974), as the urban centres grow faster and faster.

An urban system is considered by most people in terms of the built up environment and the socio-cultural
milieu, man has created for himself in the city. As such, city has represented the highest impression of man's technology, development and cultural evolution and by any standard, is an immensely complicated entity. Some of the obvious components of the urban system, housing development, transport network, and other facilities and services, business and government institutions - represent extremely complex system, each, in its own right. Where industrialization takes place, the character of habitation also undergoes a change. Several administrative developments become conspicuous, such as the establishment of town area or municipality or corporation. The transport plays an important role in the rapid urban growth. This in turn creates problem with regards to heavy flow load and traffic congestions. There will be also fast growth of communication infrastructure (Peter, H.J. et al 1975).

Against the above said background there is a need to look at the concept of environment. Environment is the aggregate of external conditions that influence the life of an individual or population, especially, the life of man. Environment ultimately determines the quality and survival of life. This is an ecological definition which includes both physical and cultural components. Although environmentalists often emphasise one or the other, there is significant overlap between these two environmental classes (Detwyler 1971).
Jochen Colhonon (1962) and Kenrad Horenz and Robert Ardey (1968) have focused attention on the need for living territory and the possible danger of very high population densities. Perhaps it is the provision of space and adequate kinds of shelter that the urban eco-system has most seriously failed to meet its residents' biological requirements. Systems of supplying the requirements of air and water and facility for waste disposal are also under stress - especially because of increased pollution, contamination of air, water and food. All these pose problems to human health, causes repercussions on other environmental elements and threatens the general quality of life.

The environmental problems due to urban growth was not fully realised in the developed countries in the initial stages. The over urbanization and industrialization have lead to many pollution problems. These pollutants have affected the physical landscape as well as the health of the living organisms, namely man, vegetation and animals. Subsequently scientists and planners have realised the ill effects of urban growth in developed countries. Several studies relating to urban environmental problems by noted scholars such as Detwyler (1972); Hodder and Stoughten (1972), Sharman J. Rosen (1972), Ned H Greenwood and J.M. Edwards (1973); Coppock, J.T. and C.B. Wilson (1974), David Lewis (1974); Hover W. Baken (1975) and Payne (1977), have brought into
limelight the effects of pollution on urban landscape.
Economic development committee report of April 1974, work
by Dickson, D. (1970) and Benchieh Liu (1978), W.H.O expert
committee reports of 1964, 1965 and 1968, and other related
work of Kevin Lynch (1940), and Richard F. Muth (1975),
have all lead to the passing of appropriate legislature to
prevent further pollution problems in an urban environment.

It has been observed that the environmental
problems in the developing countries, are more pronounced in
places with industrial activities. The pollution problems of
the developed countries have created an awareness to the
impact of rapid growth. The developing countries, like
India, in many areas, where the industries have been expand-
ing both in size and number, have created environmental
problems relating to water, land and air. Considerable
amount of work has been done in the identification of such
pollution problems. For instance the work of the geographers
and other social scientists like Lynch (1940-1960)

Similar works have been contributed by: Sovania, N.V.
(1971), Salter, C.L. (1971), Bhargav, G.L. (1971), Cox, P.K. and
John Peel (1972), Muralidhar, Asok, K.D. and Biswanath Roy(1972)
Rugg, D.S. (1972), Brian, R.T. (1973), Dawson, J.A. and Doorkep
(1973), Mason (1973), Oliver, J. (1973), Papageorgian, C.J. (1973),
Scholler, P. (1975), Carter and Herald (1976), Ball, M.J. and
Kirware, R.M. (1976), Detwyler (1972&1976), Gary, L.P. and Burton,
Selvaraj, A. (1978), Kuma, V.K. (1979), Northam, R.M. (1979) and

The various issues relating to the growth and the functional changes in the growing urban centres have been highlighted by Geographers again and again. In the urban centres the study on population growth, migration and its effect on the area, have also been done by geographers (Cox, P.K. and John Peel (1972) and Julian Worpert (1972)). There is also contribution on the urbanization leading to increase of population and change in land value (Papa Georgian, C.J. (1973) and Peace, W.D. (1978)). There are contributions in the field of pollution problems due to increase in industrial activities, transportation and communication, urbanization and rainy season flooding are noteworthy (Kumra, V.K. (1979) and Arunachalam, B. (1979)).

There are contributions on urban environmental problems by non-geographers from various fields, such as Planning, Medical, Natural Science, Sociology, Demography, Engineering, Ethnology, Transportation, Economics and Psychology.

The above cited works highlight the various types of pollution in the environment in general, and in habitations and industrial areas in particular. Suggestions on the various methods to prevent them are indicated in those works. Few works do point out the hazards as a result of urbanization and the resultant problems. The planners have pointed out the need to plan, to meet the rapid growth and have suggested schemes to avert environmental problems. The sociologist and health specialists have traced the hazards by Noise, air and water pollution and their psychological and physiological impact on living beings, especially in the urban environment.

Environmental Problems, Environmental quality and Developmental Plans, Noise, Water and air pollution, leading to health hazards.

The above work by geographers, non-geographers and others on India, show the general growth of urban areas and a few specific environmental problems, such as floods in rainy season in Bombay, industrial pollution in Calcutta and Visakapatnam and pollution in Kanpur city. In the urban areas the growth of population and the resultant crowding, transport congestion, housing problems, water pollution etc. have been analysed. However, there is no comprehensive work by geographers on any urban centre in India evaluating the overall growth and the emerging environmental problems.

Similarly the work by non-geographers clearly show environmental problems like water pollution, air pollution, traffic congestion, noise pollution, solid waste problem, effect on natural vegetation and so on, in a particular urban environment. The work has also highlighted the effect on the areas and has suggested remedial measures. There is no specific work showing the overall growth of various urban environmental factors and the emerging environmental problems.

From the above review of work it is clear that a study on each urban centre is essential to bring out
the pace of growth and the resultant environmental problems. For future planning all factors have to be included to meet the demand of the growing centre and also to provide for future needs.

1.2 Problems of Urban and Metropolitan Development:

Acquiring adequate knowledge about the environmental problems, relating to urban growth, has been given very little importance in most of the developing countries including India. The understanding of the environmental change is lacking, as it has not been stressed. There is a need to look into the reasons for neglecting the study on the relationship between man and environment. This will help to understand the environmental problems in cities. To get a clear understanding the history of urban growth and the environmental factors have to be systematically traced (Ripper, M. 1974).

As pointed out earlier city being an integrated system of man and environment, it is impossible to isolate completely the elements and process within the urban environmental system or to separate them from each other.

Any change in the urban system may be referred as a disturbance in environmental unity. That is, all the elements and processes of environment are interrelated and
interdependant, and that a change in one will lead to change in the others. The functioning of an urban centre gives rise to demand for more space and other requirements. The main attention of man is to include all possible means to satisfy his ends. After a stage he starts facing problems, as the urban environment is able to provide only to a specific limit, beyond that any atom of demand becomes a burden and by trying to provide, even a single demand, the environment will be over burdened. The resources flow in the urban environment is modified for human use. It is also sometimes conserved for future use. It is difficult to consider how much is used and how much is thrown out. The end products, do add to the environmental elements in the form of visible wastes and invisible wastes. In later stages, these get accumulated and result in a number of problems, which demand immediate attention and planning (Robson, B.T. 1975).

The rapid urban growth, whatever be their stage of development, has its gratifying as well as its disquieting aspects. Gratifying because it gives plenty of opportunities for higher standards of education, housing, social satisfaction and public health. Disquieting because of the encroachment on space, and the threat to health from noise, over crowding and the general degradation of man's physical and social environment. Metropolitan areas are growing at a
rapid rate, not necessarily because people like living in them but for their apparant efficiency as centres of the industrial production (Bijilani, H.U. 1977).

A town, soon, out grows its original site and if it expands, any more, people try to get the best out of it. There can be, therefore problem of site. First the growth will be, by filling the spaces. There is a limit to this sprawling, outwards. Many storeyed blocks are not uncommon now. Some are awkwardly cramped by natural barriers. When people are living close together in cities, any out break of disease results in the spatial spread to different parts of the city. This often arises from the insanitary and unhygienic living conditions that exist in cities and towns.

Urban explosion begins in the centre and then spreads towards the fringe. People tend to move from their place to the rapidly growing towns, before, proper houses are built for them. People living in the fringes, will not have the minimum requirements provided, hence they are only a burden to the central place (Doxiadis 1978). Open lands should be distributed throughout the metropolis in a fine grained pattern, in contrast with the active urban areas, producing a varied texture. A secluded park or a quiet walk, immediately adjacent to a centre or to a compact housing, can be more valuable to the city dwellers, than it being located at far away places.
The towns have become synonymous with society. This helps in the control over the economic needs. This identification has a great influence on urban models. The urban environment is a deceptively simple term. It is easy to spell out what is urban, but not so easy to spell out its social significance. The type of environment to be stressed under urban centre is also important. Robson, B.T. (1975) discussed the identification of town not by structure alone, but by its society and political life. Slums may not be unconnected, to any grown urban centre.

Urban growth leads to problems of congestion of population and transport. The internal structure of the city highlights the problems connected with the urban sprawl. There is evidence of crowding and rush by commuters between the centre and the fringe areas. Congestions will be more when facilities are crowded. In the urban areas the growth leads to transit development and thus into transport congestion and traffic problems (Hovell, J.P. 1975). The air pollution has also resulted due to the failure to stop the atmospheric waste disposal, on urban land use patterns.

Many urban problems have developed because the 'Cores' are small and congested. The formation has taken place at a time when the volume of traffic was minimum. There is no core which has formed anticipating future growth
and increasing congestion. In some cases the growth has been rapid. Every town has its uncontrolled growth. After a specific stage further development alone is planned (Bijilani, H.U. 1977; Johnston, R.J. 1977). Most of the problems are due to poor planning and old fashioned industrial approach and indifference to the environment. Many environmental problems exist because decisions are made on the basis of traditional values, that are no longer appropriate (Berry and Brian, J.L. 1974 and Craik, Kenneth and Zube Erwick 1976). Some of the urban transport management problems can be identified such as, commuters choice of destinations (Cox, K.R. 1972), transport noise by modern modes (Chalupink, J. 1970 and Dickenson 1970), Management of Urban Public Transport (Peter, H.J., William, H.J. and Moran, A.J. 1975), and Transport Emission and Environmental Health (Wadden, R.A. et al 1976) etc. Similarly the work done on congestion and pollution problems can be indicated as air pollution and the impact on residential land value (Anderson, R.J. and Crocker, R.D. 1971), Rapid urbanization on soil waste in urban areas (Augus Wilson 1979), Seasonal flooding in an urban environment of Bombay (Arumachalam, B. 1979), and Air pollution and noise pollution on human health (Burchiiah Liu 1975, Kameswaran, S. 1979). The following are the various fields on which considerable amount of work has been done. The fields are, Hazards of Environmental pollution (Dixit, D.K. 1978); Water pollution and sanitary
engineering needs (Hussain, S.K. 1974, Homer, W.P. 1975); and congestion and need to encourage satellite town growth (Halder, D.K. 1976). All these show the relationship between urbanization and industrialization. The work on other problems are, urban growth problem (Brian, R.T. 1973); the change in the quality of the environment and urban problems (Coppock, J.T. and Wilson, C.B. 1974); Environmental pollution and the problem of planning (Chatterjee, 1976), the urban transition and the industrializing society (Friedman, J. and Robert Walff 1975) etc. Urban planning problem (Lynch, K. 1960, Sovani, N.V. 1966, Sinha, B.N. and Achutha Rao, J.N. 1968, Mason 1973, Hicks, 1974, Smith, W.B. and John Hiltner 1975, Robson 1977, Strelton 1978 and Kumra 1979) is another dimension of environmental management in urban areas. There are other problems traced due to urban growth leading to ecological imbalance (Bankeswar, S.S. 1979). The major environmental problems do include urban economic problems (Boulding 1971 and Muth, R.F. 1975), Housing problems (Geoffrey, P.K. 1977), Waste water management problems (Homer, W.P. 1975), Migration, as a reduction of urban stress (Julian Worpert 1972), perception and attitude towards urban environment (Maris, E.B. 1975) and the evaluation of social cost and psychological impact (Pearce, W.D. 1979, Sarikwal 1989) etc. Urban amenities problem due to growth has been studied in detail by Steel and Earnest (1960), Zajic, J.C. (1971) and Sivakumar, (1980).
1.3 An Overview of the Problem: Review of Literature:

The study on various urban growth problems and environmental problems have indicated that population, social and cultural factors, industry, transport, residential area and other service facilities as the potential factors in several environmental issues. These factors do undergo change along with the growth of the urban areas. The growth demands more and more facilities. The provision of the required need is a problem. This increase, in demand, after a stage, will become too complicated for management.

Indian cities, in general are crowded and losing their ability to provide their inhabitants with necessary urban facilities, like transport, electricity, drinking water and sewage. India has realised the hazards of rapid growth hence they take proper steps to prevent severe reaction to hazards.

During the last few years, urban and regional planners have found, that, in addition to the numerous aspects presently accepted, as standard considerations, in the preparation of plans, studies and policies, for cities, the important element to be included is the pollution control factor, is the 'waste management'.
The evolution of man in urban environment shows that, he has learnt to control his environment and make best use of the environment by using his technological attainment. The problems to be faced in social and economic development are tremendous, but man has the ability to face the challenge. Habits and attitudes, developed over centuries, are not easily changed. To day there is a general public awareness of the problems and a strong willingness to do something about it. It is felt that it is no use treating the problem after facing difficulty but the root of the problem has to be traced and through proper planning it has to be prevented in future. This needs full regional co-operation.

Water has been provided in any urban centre with the engineering work involved years ago, when designers were not aware of hydrological problems, in the city, as they are today. Further more, when urban growth has increased, the magnitude of floods and other water problems have also increased. As more people move into urban areas, the areas grow and also the population. This growth changes the power that governs the occurrences and movement of water. Flooding, during the rainy seasons become a regular feature in urban areas. The growth is such, that the residential area is developed in all available space, irrespective of the site, hence the natural low lying areas, do not get a proper cut let for the surface run off, hence get stagnated. These damage, all the residences which are located in these sites.
The frequent urban usage also reduces the porosity and permeability of the soil, hence there is more water waste as run off and leading to reduction in ground water level.

The environmentally induced illnesses are mainly due to the poor environmental control measures. Improper disposal of drainage water has lead to mosquito breeding creating scope for Malaria, filaria etc. Indiscriminate disposal of human waste, results in water borne diseases. Similarly the rodents at the waste heaps create health problems. A number of constitutional checks have been imposed to reduce problem.

Human activities have lead to air pollution also, by the increase in vehicular traffic, waste disposal and industrialization. Similarly, solid waste in open dumps or in inadequate fills, are not first aesthetic disasters. Industrial and domestic wastes from a number of septic tanks and pools drain into shallow ground water reservoirs, which inturn run into streams. Obviously the quality of water in such streams will be altered. The dissolved solid wastes may be added. The need for space also leads to fast clearing of vegetation from water zones, which leads to waste of water and soil erosion along this area. The changes also affect city temperature. The environmental effects of stream warming due to urban growth are poorly known. Such
affects should nevertheless concern us, both because of unknown changes and because urban areas, continue to grow.

With regard to noise pollution, usually the industrial activity alone is associated, but, the transport and community activities are equally harmful. The more the mechanisation, fast transport, increase in the volume of traffic and in terms of ecology, the more the degradation of the environment will be. Country like India is developing the activities and has not faced problems like the west. Still if proper check has not been imposed, even at the beginning the problems, will become, like the west. For example, to expand transportation lines the trees are ruthlessly felled. These trees used to help to absorb the sound. With the increase of traffic noise, reduction in such trees, will lead to calamity only. Noise is an important environmental problem. Any rule to prevent noise has to be implemented. But they are not done so. Even in the no horn area, the horn is used continuously. Similarly in cities, speed, musical horns etc. need to be prevented, effectively.

The treatment of poisonous and deadly pollutants has become a common feature. Every urban area has problems by pollution of water, air and land. Many lakes and rivers are being polluted by solid waste dumps and diversion of
industrial effluent in the waters. The rivers like Chaliyar in Kerala, Cauvery near Erode are a few examples.

Space is a biological requirement of urban inhabitants, that has received very little attention indeed. It is obvious, that, as a city grows, it consumes more and more space.

The awareness and responsibility towards immediate environment is not much, hence any organised community must be prepared to protect itself, against the negligence of its own members, through, regulations, public workers, and proper programming. Modern cities draw in, tremendous amounts of various substances, that they discard totally and refuse. Refuse is the discarded solid waste materials resulting from normal community activity - including garbage, rubbish, ashes, street refuse, dead plants and animals and solid residential wastes. Changing pattern of man's life and activity has added to varied composition of wastes, like, refuse, nightsoil and sludge from sewage. In the past solid wastes, were produced mainly in the home and to some extent by commercial activities. But today's problems, are created by the movement of people into rapidly organised communities and by advances in industrial technology. In the last few decades changes took place in the developed countries but now even the developing countries do have significant changes.
The rapid growth of industrial activities produce disposable products too. The technological advancement has enabled every urban area with industrial activity to have their own ancillary industries, thus leading to increase in industrial production. The modernization and demand for more amenities have increased, not only the quantity of waste but also the bulk. They include paper, packing materials, plastic, building materials etc.

The solid waste disposal is another problem of any urban centre. The provision for solid waste collection and quick disposal is so inadequate, they do create an unwanted problem in growing urban centres. Prevention of pollution is cheaper than cleaning. The wastes are thrown in the nearest open space not bearing in mind the environmental problem they will be creating. Quick urban collection and disposal is very essential in a city which is fast growing and the open spaces are disappearing.

The above cited critical evaluation of urban issues give a broad insight into the likely environmental problems in places where fast urban and metropolitan development is noticed. Hence, it is worth taking the study of one such urban centre and evaluate the levels of growth and its impact on the environment and the resultant problems.
It is not possible to take up the investigation without the proper review of work done in the emerging environmental problems in urban areas. Various studies conducted in the field of geography on environment in the past several years show that environment both physical and cultural, is an important aspect of the study, and the relationship between man and his environment is equally important in such studies in geography. Limited work has been conducted on emerging environmental pollution in geography. The contribution by Humboldt, Ritter and Ratzel (1795-1840) gave the basis to environmental studies. The concept of unity of nature presumed a casual interrelation of all individual features in nature. They said, that unity of nature included, organic as well as inorganic and human as well as non-human. The problem of pollution came in after 19th century. In the early days, it was not considered as problem. It became an important aspect of study for geographers as well as other scientists only recently. The most serious London smog of December 5-9, 1952, which lasted for 5 days took a toll of 4000 lives (Peter, H. 1975). The smog problem has lead to formulation of control measure in Los Angeles (Blund, W.R. 1976). These have lead to the formulation of clean air act in 1956.

The population size and distribution and average expectation of life as the relevant factors, in the study of
pollution and its effect on human health, in reference to
Ancient Egypt, have been contributed by Dixon, D.M. (1972).

During 1970s, several studies on population has been done, with
growth as a reason for congestion and depletion of resources.
The stress for population control has been suggested. The
economic difference leading to rural, urban migration, which
in course of time affect the urban areas (Cox, P.K. and
John Peel 1972) is also another concept for study. Papa
Georgian, C.J. (1973) in his work has shown the impact of
the environment upon spatial distribution of population and
the land value. Norman Lee (1973) in his study has shown
the increase of pollution, and the population increase,
leading to increase in solid waste disposal.

After the introduction of clean Air Act of 1956,
scientists from different countries were attracted to study
the problem of pollution, and its effects on the human
environment. A good deal of work has been done by the
Scientists, Engineers, Sociologist, Economists and Planners
on environmental pollution in developed countries, but in
the field of geography only limited work has been done.
Berry, B.J.L. and Brian, J.L. (1974), Detwyler, R.T. (1975),
Chatterjee, S. (1976) have worked on the various pollutions
of the environment. In association with Horton and others
Berry has pointed out the need to look into pollution
problem and has suggested frame work planning to control
the pollution.
In the work of Jones et al (1972) pollution has been considered as a problem for the population living in any part of the world. He has also analysed causes of pollution and given proper suggestions to solve this problem. Gordon, E.L. (1974) has pointed out the urban planning problems.

Environment as a core concept of geography has been defined by Strahler (1977). It is clearly understood that due to failure in the application of science and technology, at the proper time, the environment problems have increased.

(Environmenental problems are also found in Soviet Union and East Central Europe (Dianas, 1974, Copock and Wilson 1974) considered in their pollution studies, the quality of environment and its impact on human health.) Emphasis has recently shifted to the city environment, where certain manifestations of pathological behaviour and special malaise appear as increasingly serious side effects of city life (Michelson, W.H. 1970). He has also done detailed study on the impact of pollution on human mental health, among the residents of the area near Kennedy Air Port.

Wood (1974) has shown the harmful effect of open burning of fuel. He has also mapped and drawn guide lines for further work in this line. This has helped the geographers to work in this field.
In India the study of pollution is only in the level of conservation of resources and distribution. Kayastha, S.L. (1966) in his study has pointed out the soil erosion due to deforestation, excess grazing and faulty agricultural practices. He has attempted to relate the water pollution in different cities like Varanasi, with the proposed rational water policy of India.

In the field of environmental pollution the work by geographers is limited, but by other scientists it is satisfactory. The contribution by National Environmental Engineering Research Institute (NEERI) Nagpur is significant indeed. Agrawal and Gosh (1974) have correlated air pollution and the occurrence of respiratory diseases.

Bharadwaj (1971) has considered population as the cause of city pollution. Pandey (1976) has conducted various research projects on water pollution in the river Ganga. The urban growth and the seasonal flooding in Bombay has been pointed out by Arunachalam, B. (1979). Kumra, V.K. (1979) has contributed on the various pollution effects in Kanpur, which is an industrial city. He has shown the extent of pollution and the harmful effect. Hence the contribution by geographers in this field in India is considerably appreciable.
Bijilani, H.U. (1977) has brought out the various problems of urban growth. He has pointed out the need to increase the facilities as the growth takes place. He has defined the sources of pollution and the nature and effect. But he has not given any spatial analysis of pollution intensity and their hazards. Karan, P.P. and Bladen, W.A. (1976) have done very useful work in the field of environmental pollution in India. Pollution has been related to the increase of population. Karan, P.P. (1977) in his work has suggested pollution control strategy consistent with social cultural institution and priorities of population can be developed through assessing the knowledge of perception of the environment stress.

From the study conducted in the field of urban and environmental problems, it is understood that the contribution by the geographers are less than scholars from other fields. The contribution on pollution and growth problems are more. Ashish Bose (1973) has traced the process of urbanization in India. Sharman, R.R. (1972) has pointed out the environmental problems due to growth of urban functions. Gore (1962), Sovani, U.V. (1966), Munichakravarthi, R.L. (1969), Sarej Kamal Pal (1979), Trivedi and Harshad (1971), Surya, G.S. (1975), Karan, P.P. (1977) and Saribval, R.C. (1978) have worked on urban industrialization and environmental pollution. Chatterjee (1976), Bijilani, H.U.

Medical profession was the first to discover pollution on human health and well being, during the last century or so. Sanitary engineers and public health experts have done much more in recent decades, in the development of methods and techniques, towards waste control. The time has come to apply this knowledge not as the basis for stop gap and energy measures in crisis situation, but in a systematic and preventive way for all urban settlements, regions and indeed the environment, as a whole. If information or experience is still lacking in certain areas, it must be identified and the gap filled through research and experimentation. A positive and constructive approach is required, through the definition of problems, decisions as to what should be done or what levels of quality to be achieved, the development of the appropriate technological
methods and the application of such solutions, within a
given or modified political and administrative frame work,
is essential.

Many urban developmental studies have been done
in India on the development, by way of expansion of the area,
and the environmental problems (Antony, C.J. 1972, Detwyler
The various environmental problems like physical environ-
ment, housing problems, encroachment on arable lands, traffic
congestion, noise pollution, industrial pollution, solid
waste and water, atmospheric pollution have been identified
by various workers like, Chalupink, J. (1970), Dickenson
(1973), Allen D. McKnight (1974), Thrope (1974), Geoffrey,
P.K. (1977), Goldmann, J.M. and Shefer (1977), Salvaraj, A.
(1978), August Wilson (1979), Mona Benerjee (1980) and
Sivakumar (1980). In the metro area various studies on
the pollution by industrial growth and wastes, both solid
and liquid, have been done by Desai, P.B. et al (1969),
and Bart, T. et al (1977). The environmental Scientists and
Engineers have contributed on the devices to abate further
pollution crisis. The work is on, levels of pollution,
its effect and how to abate them. Social scientists have contributed on society, as a whole, and how the society is affected by environmental problem, congestion and noisy areas and their psychological effect on man.

There is need to study the emerging environmental problems and their functional relationship in a growing urban centre. Perspectives on the problem have to be dealt with. The evolution of growth is essential to stress the level of environmental interaction. The growth of various environmental factors creates environmental problems, with regard to the provision of the needs. The stage of growth and trend, gives a picture on the likely environmental problems and help to plan means, to avoid an environmental hazard and pollution.

Thus it is clear from the above review work, in India, though there is a growing concern about environmental problem in cities, most of the work tend to look at the environmental issues separately such as environmental pollution, urban solid waste etc. No attempt has been made to evaluate the urban problem and issues relating to urban growth and resultant environmental problems. Therefore, there is need to integrate the various issues to growth components. It will be ideal to select a growing industrial city for such investigation.
In the light of the problem observed, an attempt is made to study the integrated position of a city, highlightening the main environmental issues and problems.

1.4 Aims and Objectives:

a) To analyse the growth and development of Coimbatore and the resultant urban morphological structure.

b) To analyse the socio-cultural and industrial landscape.

c) To examine the transport network and its implications.

d) To identify the problems and issues relating to the growth of residential and neighbourhood areas and the demand for urban amenities like drinking water and drainage facilities in the city.

e) To trace the integrated picture of emerging environmental issues and problems.

1.5 Selection of the Study Area:

Coimbatore is located between 10°58' and 11°2' North latitude and 76°56' and 77°10' East longitude at the Western margin of Tamilnadu. The city is situated on the right bank of Neyil river, a tributary of the river Cauvery (Fig.1.1).
That is, it lies to the north of the river. The city is at a distance of 500 kms. West of Madras and about 95 kms. South-east of Ootacamund. The city is 425 metres above sea level. The city is located North of the Noyil river at the point of intersection of major highways running North, South, East and West. The North-south highway begins from South Mysore to Madurai and further South. This route descends from the Mysore plateau via., the Dinbhamghat road and passess through Sathyamangalam and proceeds via. Coimbatore to Pollachi and Dindigul. The East-west route links Trichy and other towns in Tamilnadu, with towns in Kerala through Palghat gap. The Noyil river is a non-perennial tributary of the cauvery river and occasional floods in the river do not cause any havoc as the city lies on a high and well drained ground. As compared with the Madras city, possibly Coimbatore registers rapid change in the urban landscape in Tamilnadu. There are striking factors such as growth of population, educational centres, health centres, commercial centres, industries, transport and residential areas. The schemes to increase facilities are being modified every year, hence within the city area, the nature of growth and emerging environmental problems are worth analysing. In view of this, Coimbatore city has been selected for the study.
1.6 Data Source and Research Design:

Data for the study have been collected from the primary source and secondary sources. To get the details on problems experienced in different areas, personal interview was conducted by the scholar with the help of field assistants to collect data on the identification of problems. Personal interview with the Health Officer, Health Inspectors of various areas and residents, was conducted to verify the findings.

The secondary data on city growth aspects, population, educational facilities, recreational facilities, health centres, distribution and functioning of the industries, transport road network, flow load by various vehicles, increase in the household and residence numbers, water supply potential, schemes of improvement, drainage and sewage existing in the city, have been collected from census of India Hand Book from 1881 to 1961, District Education Office, Corporation office records, Records from the Directorate of Industries, Regional Transport Office, Records from Cheren Transport Corporation, Town Planning Department of the Corporation, Town and Country Planning Department Reports, Public Water Works Department records and other published reports on Coimbatore.
A simple research design has been formulated which is as follows. The growth has been traced by evolution. The data have been quantified to highlighten the changes by growth. The chronological change in the urban landscape and the analysis of already identified problems have been correlated. The likely future problems have been identified with the existing problems and the trend of future growth.

1.7 Scope and Limitations:

Coimbatore which is an emerging industrial town has grown within a short duration with many functions. The study on the emerging environmental problems within the city areas will be a contribution to understand the urban growth problems by taking various environmental factors and their impact within a city. This will be a contribution to the subject itself.

The study is limited to the city area. The study confined to certain urban landscape phenomena such as social landscape, industrial, transport and residential landscapes. The environmental problem analysis is limited to growth impact, congestion, waste problem and amenities problems in the city.
1.8 **Organization of the Thesis:**

The first chapter deals with the type of work done in the field of urban growth and environmental problems. The study area has been chosen and the aims and objectives are specified. The scope of the study and the limitations are given. The second chapter highlights the growth and development of Coimbatore. The development, in terms of historical evolution, structure, land use change and CBD growth and expansion have been analysed. In the third chapter attempt is made to trace development of socio-cultural landscape. Factors like population, education, recreation, commercial and health services are analysed. The fourth chapter discusses about the emerging industrial landscape. The emphasis is on the growth of industry in relation to various communities' influence on the growth, increased functions and industrial workers. The fifth chapter deals with the transport network, flow load in the city and resultant problems. The sixth chapter gives an account of the residential growth, housing density and household density of the city and the neighbourhood towns and associated problems. In the seventh chapter an attempt is made to study the protective water supply, other amenities, drainage problem and waste management. The eighth chapter gives a comprehensive account of the emerging environmental problems and issues. The summary and conclusion is given in the ninth chapter.