STUDY OF FRINGE AREA INDUSTRIAL DEVELOPMENT (CASE STUDY — BALANAGAR, HYDERABAD)

A DISSERTATION

submitted in partial fulfilment of the
requirements for the award of the degree
of
MASTER OF URBAN AND RURAL PLANNING

By

KORALLA SUBHASH

DEPARTMENT OF ARCHITECTURE AND PLANNING
UNIVERSITY OF ROORKEE
ROORKEE-247 667 (INDIA)

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CANDIDATE'S DECLARATION

I hereby certify that the work which is being presented in the dissertation entitled "STUDY OF FRINGE AREA INDUSTRIAL DEVELOPMENT (CASE STUDY - BALANAGAR, HYDERABAD)", in the partial fulfilment of the requirements for the award of the degree of MASTER OF URBAN AND RURAL PLANNING submitted in the Department of Architecture and Planning, University of Roorkee, Roorkee is an authentic record of my own work carried out during the period from June 1990 to February 1991 under the supervision of Prof.N.K.Tayal, Department of Architecture and Planning, University of Roorkee, Roorkee.

The matter embodied in this dissertation has not been submitted by me for the award of any other degree or diploma.

Dated : MARCH 14, 1991.

K. Subhash.

(KORALLA SUBHASH)

This is to certify that the above statements made by the candidate are correct to the best of my knowledge.

N. K. Tayal.

(N.K.Tayal)
Professor,
Department of Architecture and Planning,
University of Roorkee, Roorkee.(INDIA).

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K. Subhash.

(KORALLA SUBHASH)

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ABSTRACT

Industrialisation is a process of growth, which organically linked the social and economic past to the parallel process of socio-economic development. Industrial activity is an important aspect in the spectrum of National Development.

In order to accommodate the new industries and the existing industrial activities, the planning of new industrial towns and the redevelopment of the existing industrial areas is required to be done. The success of such developments primarily depend on the correct procedure adopted for an overall planning of the industrial entity ie., the industries and the township.

The present study had been done, to know the lacuna's and lapses of the existing industrial area. The inadequacies of basic needs, environmental problems, haphazard growth, improper planning and future problems of the industrial area are found out.

A complete study of Balanagar show the inadequacy of planning and control in the area during the initial stages of development. Majority of the problems in Balanagar are due to the ribbon development along the Bombay National Highway No.9 and shortage of housing stock for the industrial workers.

The study deals with several aspects of the problems in Balanagar. Conclusions are drawn and the study ends at giving recommendations for fringe industrial developments like Balanagar.

CHAPTER - I

INTRODUCTION

1.1 Introduction To Industrial Development

Industrial development is most important of all economic developments since it raises the per capita income and standard of living at a faster pace, at the same time provides employment to a large number of workers. After Independence, many Indian towns got industrialised depending on their industrial potential. This potential for industrial growth of an area depend on various factors which lead to the economic production. They are :

1) Availability of raw materials.

2) Favourable climatic conditions.

3) Availability of labour force.

4) Presence of good demand for the product.

5) Government incentives as loans, subsidies, concessions etc.

Apart from the above factors various other factors are also responsible for the agglomeration of industries in and around urban areas :

1) Availability of good transportation facility for the easy movement of raw materials and finished products.

2) The Urban areas offer specialised facilities in Banking, finance, accounting, entrepreneural guidance, commerce and other allied activities which assist the industry.

3) Protection from fire accident, police protection, medical facility etc., are readily available in urban areas.

4) The efficient public services and housing facilities for the industrial workers in the urban areas would enhance the chances of industrial growth.

5) The population concentrations in urban areas provide good demand and leads to the advantage of using the full production capacity of an industrial unit.

6) Due to the presence of a number of industries, skilled labour is easily available.

The industrial development of urban areas also result in certain diseconomies like congestion, pollution, rise in land and rental values, heavy traffic etc., which are overlooked due to net economic production. This leads to the expansion of urban areas, particularly along major transportation arteries. The industries develop in the outskirts due to the availability of large tracts of land at low cost.

Balanagar is an industrial area in the Northwestern fringes of Hyderabad. It was identified for industrial growth in 1963, due to the rapid industrial growth of Hyderabad. National Highway Number 9 to Bombay, Medak state highway and the broad guage railway line to Bombay offer good transportation facility for the industries of Balanagar.

The establishment of Hindustan Aeronautics Limited in 1966 and Indian Drugs and Pharmaceuticals Limited in 1967, under the public sector had provided favourable environment for the growth of ancillary and associated industries in Balanagar. These were organised in six industrial estates which provide developed plots and sheds for the ready establishment of industrial units. Though, the industrial units are well organised , the development of residential, commercial and other landuses in Balanagar area had not been planned properly. This had led to the creation of multi-faceted problems of traffic, Housing, Socio-economic and Environmental criteria.

Hence, in order to attain an integration of such fringe industrial development, a variety of planning parameters need to be considered. These, if not accounted, lead to congestion due to heavy migration from rural areas to urban areas resulting in slums, shortage of drinking water, lack of education, medical and recreational facilities. The expansion of amenities and facilities in urban areas will not be able to cope up with the rapid population growth due to heavy inmigration.

The expansion of various activities must be in the light of their employment generation for which the urban area must be able to provide sufficient housing, facilities and amenities. So, in order to achieve a balanced growth, it is essential to know the undesirable growth pattern, parameters for integrated growth, effetive implementation techniques, knowledge of economics, law etc.,

In view of the above, this dissertation mainly deals with the study of Balanagar Industrial area, due to the paucity of time, data, information and other facilities.

1.2 Identification Of The Problems

The problems identified regarding the industrial growth of Balanagar are categorised into four types. They are :

1.2.1 TRAFFIC AND TRANSPORTATION PROBLEMS

The development of commercial, residential, informal and other activities in Balanagar was along the National Highway. This had resulted in acute traffic problems along this road. They are:

1) The encroachments on the sides of the highway by hawkers and informal sector activities had resulted in the reduction of the effective road width. This caused the pedestrians and other slow traffic moving in the centre of the road causing hinderence to the fast moving vehicles.

2) The uneven road surface created due to the poor maintenance by the authorities had resulted in the wear and tear of vehicle parts.

3) Lack of parking lots and spaces for the trucks, cars, auto trolleys, two wheelers etc., had resulted in zig-zag road side parking and thus reduced the effective road width.

4) There is no segregation of slow and fast traffic. This resulted in traffic jams and accidents.

5) The stretch of National highway in the area is used as a local road. This is causing problems to the movement of heavy traffic.

6) The improper control of traffic movement at junctions results in traffic jams.

7) Lack of pedestrian crossing zones had resulted in heavy pedestrian traffic through out the road length. This resulted in accidents and slowing down of vehicular traffic.

8) The road users are confused due to the mixed traffic flow which is moving without following proper traffic regulations.

9) The city bus transportation system is found to be inadequate during the peak traffic period. This resulted in over packing of buses with passengers and is creating discomfort and inconvenience.

10) The roads within the industrial estates are lacking drainage facilities and are also worn out. This is causing troubles to the users.

1.2.2 HOUSING PROBLEMS

Balanagar has a shortage of housing stock. The area alloted for residential development is far below the requirements of the local working force. This had created Housing problems like :

1) The residential density of Balanagar is very high about 300 persons/acre. This creates pressure on housing, commuter traffic, services with the result they became insufficient.

2) Lack of housing for the factory labourers near to their work place resulted in the creation of slums and squatters in the industrial area.

3) The migrants coming in search of jobs to Hyderabad, settle in the fringes like Balanagar, thus, reducing the available housing stock.

4) Inadequate and low standard housing stock within Balanagar for the industrial workers resulted in their housing in the city.

1.2.3 SOCIO-ECONOMIC PROBLEMS

The improper planning of housing, infrastructure facilities, transport and other landuses of Balanagar had resulted in the Socio-economic problems like :

1) The shortage of housing within Balanagar resulted in the rise in land and rental values.

2) The heavy commuter traffic resulted in loss of time and money.

3) Inadequate educational, medical, recreational and other facilities within Balanagar resulted in the dependence for these facilities on the main city.

4) Due to the dominance of lower income groups in the area there is a demand for cheap products. This led to the development of informal sector activity in Balanagar.

1.2.4 ENVIRONMENTAL PROBLEMS

Improper means of discharge of wastes and also the lack of pollution control measures in Balanagar had created various environmental problems for the areas in and around Balanagar like

1) The liquid industrial effluents are carried by Kukatpalli Nala into Hussain sagar lake thus, introducing toxicity and thus polluting its waters. It is also resulting in fish kills.

2) The gaseous emissions from industrial units flow and enter the airmass of Secunderabad city, thus polluting it with particulate matter and gases.

3) The solid wastes are dumped in open ground. This is creating problems of smell, mosquito menace, ground water pollution in the area etc.,

4) Bad roads due to poor maintenance and lack of drainage are creating problems of dust, marshy spots etc.

5) The slums and squatters have unhygienic atmosphere due to lack of sanitary facilities.

6) Noise and smoke pollution is caused due to the slow traffic movement and traffic jams along the National Highway.

7) The K-main proved ineffective in controlling the pollution from entering the Kukatpalli nala due to its insufficient capacity and improper maintenance.

8) Some industries(Chemical and drugs manufacturing units) release toxic odours, causing sickness to the people.

9) Failure in proper implementation of pollution control measures on the industrial area aggravated the pollution problems.

All these problems have resulted due to some planning lacunas during the initial planning level for the Industrial development of Balanagar. So, this dissertation would deal with the analysis and in finding the causes of these problems. Finally, it would

give a set of guidelines that would have to be considered in case of such fringe developments.

1.3 Objectives Of The Study

The purpose of this study is to throw light on the impact of an industrial fringe on the urban area. This gives adequate insight in the process of planning the location of an industrial area in the urban fringe and the restrictions to be laid on such developments.

Industrial area in the vicinity of an urban area must have an integrated development, but at the sametime be of self-regulatory and self-sufficient to a certain extent. The physical, social and environmental effects of an industrial urban fringe must not cause problems to the city.

The objectives of the study are listed as follows :

1. To identify the factors responsible for the industrial growth in the urban fringe areas.
2. To identify the impact of an industrial fringe on an urban area in terms of the physical, social, economical and environmental criteria.
3. To study and analyse the problems caused due to the impact of an industrial fringe on the urban area.
4. To formulate guidelines for the integrated development of fringe areas with industrial growth.

Further, an attempt will be made to make certain modifications in the study area-Balanagar, in order to create an atmosphere of integral development. Emphasis will be on :

1. The development of a procedure in order to solve the problems caused by industries in Balanagar on Hyderabad city.

2. Measures to be taken on the industries in BALANAGAR for controlling the environmental quality.

3. Road modifications and traffic regulations to be done in the order to avoid slow traffic, traffic jams, accidents and other related problems.

1.4 Scope Of The Study

The scope of the study would be to evolve at a broad based strategy for an integrated development of a fringe area with industrial use.

1. The study is confined to the area within the jurisdiction of the Hyderabad Urban Development Authority (HUDA).

2. The study is mostly based on secondary sources of data and information readily available.

3. Study limits to the preparation of guidelines for the development of an industrial urban fringe.

1.5 METHODOLOGY

For the purpose of the study data and information regarding Balanagar and Hyderabad was collected from Primary and secondary sources. Hyderabad Urban Development Authority, Andhra Pradesh Pollution control Board (APPCB), and other government offices were consulted for the purpose of data.

a) The collection of data and information is done through :

i) Survey conducted by the author, of some selected industrial units and areas during the period between June and December 1990.

ii)Photography done by the author.

iii)Site observations and discussion of the problems with local people by the author.

iv) Collection of information required from Census, Books, Journals, Reports, Maps, Various local organisations and government offices.

v) Discussions by the author with local administrative experts.

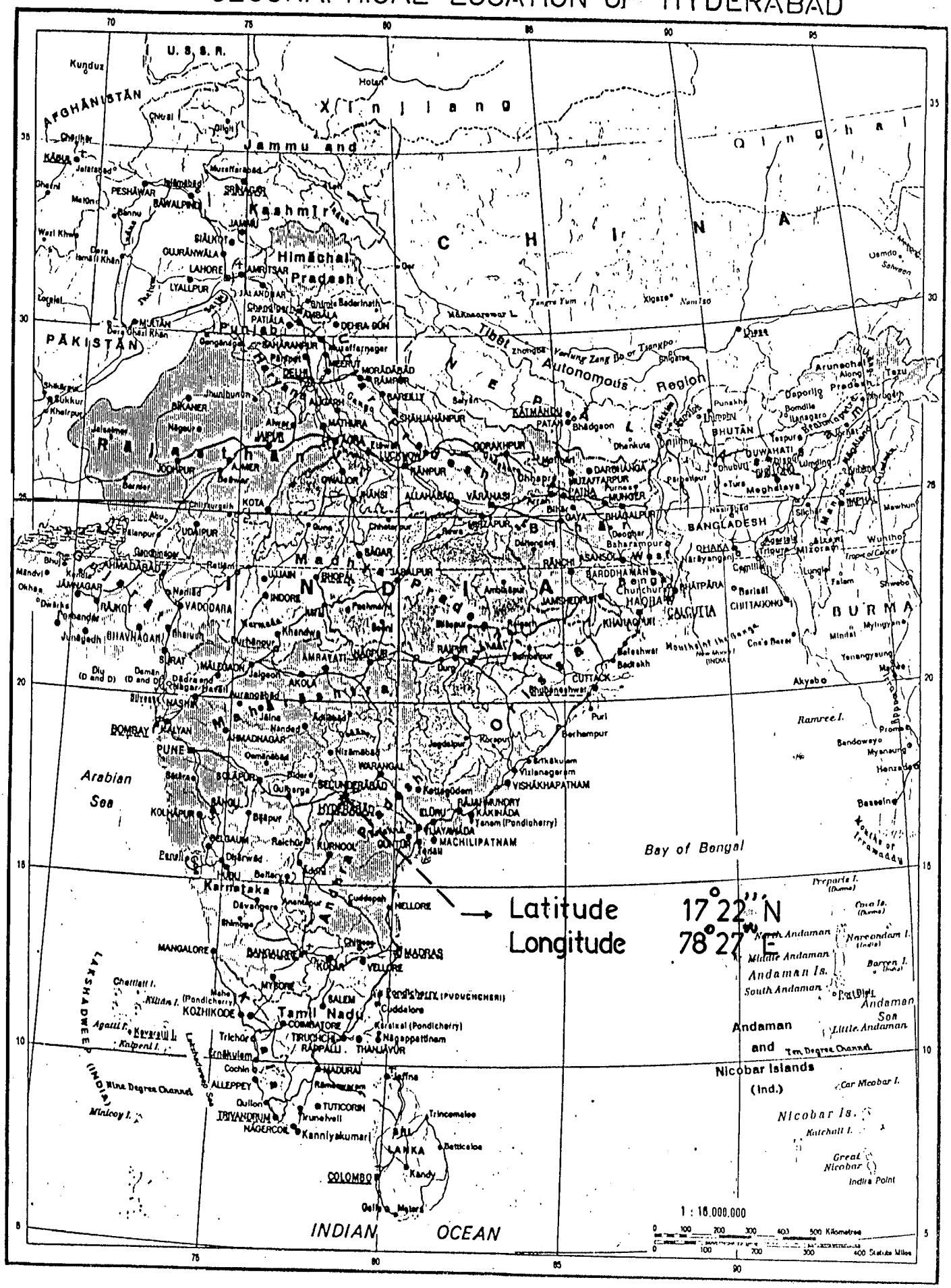
b) Based on the above study, analysis of the Balanagar Industrial area had been done to find the problems caused by the industrial development.

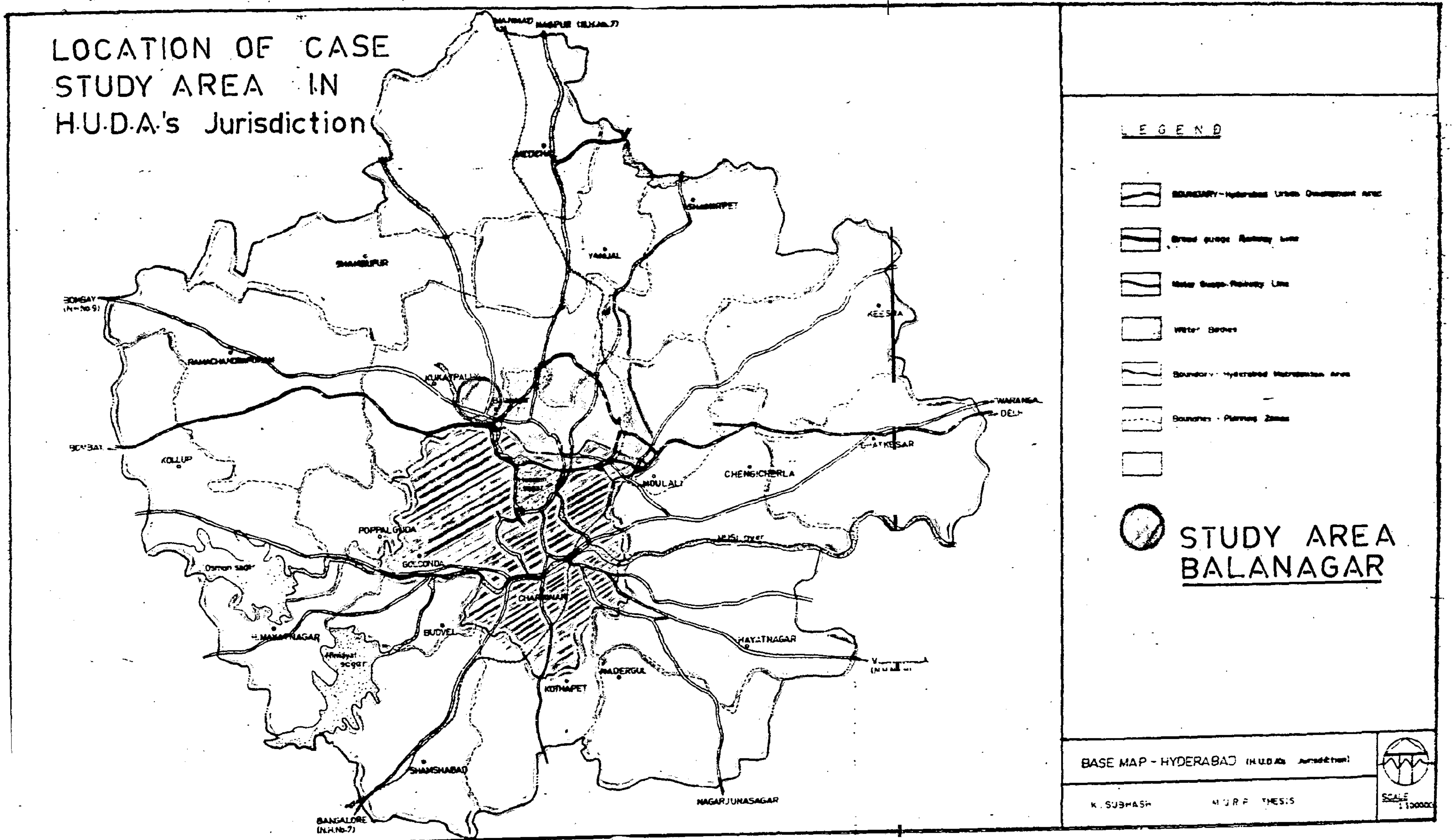
c) The impact of the fringe industrial development in Balanagar on the main city of Hyderabad has been done.

d) Guidelines had been framed after studying and analysing all the above data, for the development of an industrial area in the fringes of an urban area.

e) A developmental plan had been suggested for the study area-Balanagar, in relation to the above guidelines.

INDIA GEOGRAPHICAL LOCATION OF HYDERABAD




LOCATION OF CASE
STUDY AREA IN
H.U.D.A.'s Jurisdiction
LEGEND
Water Bodies
STUDY AREA
BALANAGAR
BASE MAP - HYDERABAD
K. SUBHASH
M.U.R.P. THESIS
SCALE
MEDCHAL
YAMJAL
BOMBAY
KUKATPALLY
KEESARA
DELHI
GHATKESAR
CHENGICHERLA
MOULALI
KOLLUP
GOLCONDA
Osman sagar
CHARMINAR
HAYATNAGAR
BUDVEL
KOTHAPET
SHAMSHABAD
BANGALORE
(N.H.No.7)
NAGARJUNASAGAR

CHAPTER - II

INDUSTRIAL GROWTH INDIA
ANDHRA PRADESH
HYDERABAD

2.1 Historical Industrial Growth In India

2.1.1 HISTORICAL BACKGROUND

In India, Industrialisation started in about 1850 A.D. in the cities of Bombay, Ahmedabad, and Calcutta and this spread slowly to only a few other areas of India. Planned Industrial development took place in India only after the Second World war ie.,since 1951. This had industrialised cities like Bangalore, Coimbatore, Ludhiana etc. Dalmianagar in Bihar, Khopoli in Maharastra were also changed from villages into industrial towns. Durgapur, Bhilai and Rourkela which were villages had been changed into towns due to the establishment of steel plants during the Second five year plan. This spread of industrialisation had accelerated the rural economy.

Therefore, there is a need for the industrial growth of a country,due to higher productivity rate and also the absorption of large number of working population. Thus, the industrial development in India was brought about through the five year plans. This programme was designed to conserve the scarce capital resources and foreign exchange and also provide a socially satisfactory regional distribution of industry.

2.1.2 INDUSTRIAL DEVELOPMENT THROUGH FIVE YEAR PLANS

FIRST FIVE YEAR PLAN (1951-52 TO 1955-56)--- The first three years of the plan period had experienced slow industrial expansion and the productivity index rose by only 6%.In order to achieve an all round balanced industrial development, fundamental policy

decisions like land policy, Industrial policy, Co-operative policy, Community development etc., were taken. Steel and power were developed as they are basic industries. Agriculture was developed at the expense of industry in order to provide strong base for future development of the country. 40% Industrial growth was achieved during the first plan period and it had brought dynamism in the stagnant Indian economy.

SECOND FIVE YEAR PLAN (1956-57 TO 1960-61)- The principal objective of the second plan was to achieve 25% increase in the national economy through industrialisation. It stressed on labour intensive, consumer goods production and also economising the capital use for balanced industrialisation. Industrial dispersal and the significance of cottage industries was stressed upon. Steel and power were given importance to form a base for future industrial development. The drawbacks of the plan were the lack of industrial dispersal and the inter industry relationship was not adequately accounted.

THIRD FIVE YEAR PLAN (1960-61 TO 1964-65)--- The third plan was developed in the perspective of long term development in the light of the two earlier plans. To achieve sustained growth basic industries were developed. Provision of housing and townships in the industrial areas is given prime importance. The Sino-Indian conflict and inflow of refugees from Pakistan had resulted in the change of plan priorities due to which the growth rate of industrial production fell down to 5.7% against the targeted 14%.

FOURTH FIVE YEAR PLAN (1969-70 TO 1973-74)--- The fourth plan brought about the industrial policy which encourages large corporate enterprises to take up new ventures in technologically

challenging field. Dispersal of industries was also encouraged. About 20% of the total plan outlay was spent for industry and mining. An annual growth rate of 5% is achieved against the targeted 7.7%. This was particularly due to insufficient demand, shortage of raw material and power, disturbed industrial relations, transport and management problems in the public sector and also the unbalanced licensing pattern.

FIFTH FIVE YEAR PLAN (1974-75 TO 1978-79)--- This plan was designed based on the effects due to earlier plans and development pattern. It achieved an overall growth in production except for a deceleration in 1977. Achieving self reliance and removal of poverty through industrial employment in rural areas, developing consumer, key and basic industries were the objectives of the plan. About 10% of the total plan outlay was invested in industries.

SIXTH FIVE YEAR PLAN (1980 TO 85)--- This aimed to strengthen the impulses of modernisation for economic and technological self reliance.This would help in the improvement of the ecological and environmental assets. The Industrial policy was liberalised to attain full capacity usage of the industrial units. The rise in imports was substituted through the export of sophisticated Indian machinery, chemicals etc., Overall the sixth plan had fought against various odds in the economy of the country.

SEVENTH FIVE YEAR PLAN (1985 TO 1990)--- This plan mainly aimed at attaining self sufficiency in food. The improvement of village and small industries was taken up. Infrastructure development, increased ancillarisation, industrial dispersal from urban areas etc., are its proposals. The industrial development was undertaken based on the available facilities, incentives,

infrastructure investment and transport subsidies. The ecologically sensitive areas are protected by the upgradation of technology through modernisation, better utilisation of assets and promotion of efficiency. The industrial program stresses the need for improved quality standards, conservation of energy and control of pollution. For a modernised industrial profile in future the Sunrise industries are identified and developed. A 7% industrial growth is the target of the seventh plan period.

So, an integrated industrial growth of the country would require efficient management, entrepreneural talent, adequate infrastructural facilities, good financial help etc. It was observed that a significant amount of rural urban migration has resulted due to the industrial development which has to be minimised to avoid congestion and chaos in urban centres.

2.2 Industrial Development In Andhra Pradesh

Andhra Pradesh (A.P.) had always had the right requisites for good industrial growth as it has a strong agro-based economy, sound infrastructural facilities and a bounty of natural resources. To promote and regulate the growth of industry in the state, Andhra Pradesh Development Corporation (APIDC) was founded in 1960. It generated a spirit of entreprenuership in the predominantly agro based society.

2.2.1 INDUSTRIAL GROWTH

The Andhra Pradesh Industrial Infrastructure Corporation(APIIC) was setup in 1973 to provide the necessary infrastructure for the development of small, medium and large industries. The main objectives of APIIC are to identify the potential growth centres, to acquire land for Industrial estates

was famous for weaving, dyeing, printing, carpentry, bronzeware and jewellery which attained worldwide significance.

Almost till the turn of the century, Hyderabad did not witness any industrial acitvity except for the traditional handicrafts. Hyderabad made a landmark in 1929 when the erstwhile Nizam's government had created an Industrial Trust fund for the development of selected Industries. After Independence for India in 1947, Andhra Pradesh state was formed in 1954 and in 1956 Hyderabad was made its capital. Like other Metropolises, Hyderabad had tremendously grown in area and population only in the last two decades. Hyderabad is the sixth largest out of the twelve metropolises of India and is the largest within Andhra Pradesh. For the developmental purpose, HUDA had divided Hyderabad into zones - 11 zones within the Muncipal area and 18 zones in the Non-Muncipal area, which together constitute Hyderabad district. [Refer Tables 2.1,2.2,2.3, figs. 2.1,2.2,2.3].

The manufacturing sector is growing and gaining importance resulting in higher demand in the transportation sector also. Hyderabad is having good linkages by road, rail and air with all other major cities in India, thus, having the advantage of marketing at distant places also. In addition, the Central and State Government incentives in terms of loans, subsidies, tax benefits etc., for the industries of Hyderabad, financial help, entrepreneural guidance through developmental boards since 1961 etc., assisted in the rapid industrial growth of Hyderabad.

The director of industries also formulated programs to give the much needed fillip to the industrial development of Hyderabad as follows :

1) Policy for expansion, type of industry etc.

2) Setting up of industrial development areas within 1Ø miles radial distance from the Hyderabad city.

3) Providing developed plots within the industrial development areas for the setting up of factories.

4) Building of water reservoirs at strategic points to cope up with the increasing water requirements due to industrial growth.

5) Providing housing for the industrial workers near to the factory or work place.

The growth of Hyderabad was to a major extent towards the Northwest and Northeast, particularly along the Highways. The advantage due to the good transportation link and strong local market due to high population concentration in the region, helped the manufacturing sector to grow at a rapid pace. This led to the fringe industrial developments like Balanagar, Kukatpalli, Sanathnagar, Ramachandrapuram, Patancheruvu, Ramantapur, Uppal, Nacharam, Moula ali etc. Consequently, the landuse of fringe areas had changed from agricultural and vacant lands to residential, industrial and other uses.

2.3.2 INDUSTRIAL DEVELOPMENT

Hyderabad witnessed modern manufacturing industries only since 193Ø. The presence of good transportation linkage with other major Indian cities, had resulted in good marketing facility thus giving impetus for the industrial growth of Hyderabad. Various other factors responsible for the industrial growth of Hyderabad.

1) The Police action in 1949, in order to merge the Nizam's state into the independent India.

2) The formation of Andhra Pradesh state in 1954 and making Hyderabad its capital in 1956.

3) The developmental program of India through the five year plans.

4) The formation of APIDC in 1960 and APIIC in 1973 and

5) The policies and programs of the Central and State Governments.

The growth of Industrial Hyderabad can be listed as follows:

1) In 1931, the Azamabad Industrial area was developed between Hyderabad and Secunderabad as it is easily commutable and acessible to workers. This had got good transport facility through the Secunderabad railway station and also had ample scope for expansion towards the east.

2) During 1940, the wartime boom had given impetus for the industrial development in Hyderabad. This had resulted in the setting up of Sanatnagar Industrial area in 1941 towards the North of the twin cities.

3) In 1960, Chandulal Birdari was developed for industrial establishments towards the south of Hyderabad.

4) Considerable increase in the industrial activity in Hyderabad can be noticed only after 1961, as more priority was given for industrial development during the third five year plan. This had resulted in further development of industrial areas around Hyderabad.

5) In 1962, Moula ali was developed for Industrial use towards the east of Hyderabad city.

6) This had continued with Balanagar in 1963, Ramachandrapuram in 1965 and Cherlapalli in 1967 to be developed for the establishment of new industries.

7) The later years witnessed Industrial developements at Nacharam, Uppal, Mallapur, Kattedan, Lingampalli, Jeedimetla and Patancheruvu.

The various industrial areas of Hyderabad possess a dominance of a particular type of industry for which it had been developed.

2.3.3 INDUSTRIAL STRUCTURE

The present industrial profile of Hyderabad is dominated by large and medium scale industries which had increased from 13 in 1967 to 243 in 1989. This sector is dominated by machinery goods and chemical industries.

The small scale industrial units had increased from 401 in 1967 to 15067 in 1989. This sector has a diversified manufacturing activity out of which metal, electrical, and non-electrical machinery manufacturing units constitute 60% of the units present in the small scale sector.

A substantial amount of the product is marketed outside Hyderabad ie., within the state and also outside the state. The labour and resources does not play a major role in the industrial growth of Hyderabad as their majority is from outside Hyderabad. The presence of good market facility only led to the development of industrial jungles in the peripheral areas of Hyderabad.

Five out of the eighteen Non-Municipal Planning Zones of Hyderabad were identified as fast developing for Industrial use. They are Moula ali, Chengicherla, Kukatpalli, Ramachandrapuram and Hayatnagar. All the future industrial development would be diverted to these zones, in order to attain a balanced industrial growth of Hyderabad.

The industrial structure of Hyderabad is dominated by Engineering industrial units. Various industrial areas have their own specialised fields of production as follows :

1)The Sanatnagar, Kukatpalli and Moula ali industrial areas have a dominance of Engineering industry.

2)Patancheruvu, Jeedimetla and Mallapur are dominated by the chemical industry.

3)Nacharam has a majority of food and distillary industries.

4)Plastic industry dominates the Cherlapalli industrial area, while Dyeing industry in Uppal and Oil extraction units in Kattedan.

Various large scale industrial units were also established in Hyderabad under public sector as follows

1)Bharat Heavy Electricals Limited was established at Ramachandrapuram in 1965.

2)Hindustan Machine Tools in Jeedimetla in 1965.

3)Hindustan Aeronautics Limited in Balanagar in 1965.

4)Indian Drugs and Pharmaceuticals Limited in Balanagar in 1967.

5)The Electronics Corporation of India Limited was established in Cherlapalli in 1967.

6)Hindustan Cables Limited in Patancheruvu.

7)Hyderabad Allwyn Limited in Sanatnagar.

A very few of agro based industries were present in Hyderabad and were located towards the Southwest. The highly sophisticated industrial units were present to the North of Hyderabad. The Moula ali and Lingampalli industrial areas were identified for the development of Heavy industrial units while the already well developed Balanagar and Jeedimetla areas are stressed on the development of light industries.

2.3.4 PROBLEMS DUE TO GROWTH OF INDUSTRIAL FRINGES

The industries of Hyderabad had grown along the major transpotation corridors. This had resulted in linear development of the city and the haphazard filling up of the vacant space in between such development. Even though this spatial dispersal had avoided the functional and some physical problems it had resulted in the creation of a variety of other problems. They are :

1) The housing stock was insufficient near the work centres thus resulting in the development of slums and squatter settlements in and around the industrial complexes.

2) As a majority of industrial workers reside in the city there is heavy commuter traffic and hence the city Bus transport was insufficient during peak hours.

3) Lack of sufficient amenities and facilities in the fringe developments had resulted in the dependence on the main city of Hyderabad.

4) The high residential densities in the fringe developments had created pressure on the existing housing, transport, amenities and facilities.

5) Congestion and improper landuse developments due to the uncontrolled haphazard filling up of the areas between the corridor developments.

6) The fringe areas are dependent on the ground water source which is polluted by industrial effluents and thus water supply would be the main constraint in the future development of the city.

7) The industrial effluents are polluting the environment in the surroundings through the pollution of land, air, water bodies, ground water, noise, smoke etc.

8) Thick developments along the sections of highways are creating problems due the condition of mixed traffic flow.

9) The dependence of fringe population on the city for commercial, recreational and other minor facilities is thus straining those available in the city and also is creating other related problems of traffic, congestion and chaos.

TABLE T 2.1
LAND USE PATTERN OF HYDERABAD

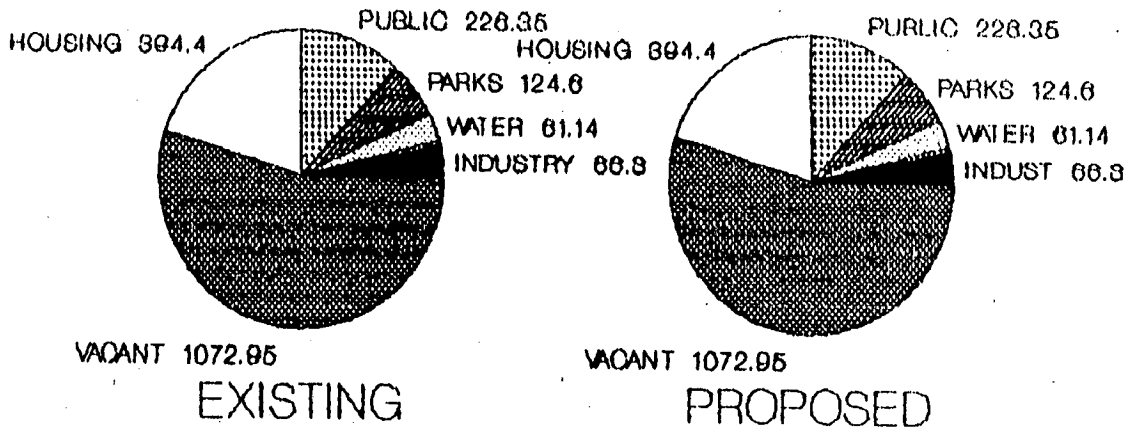
LAND USE	EXISTING	PROPOSED
RESIDENTIAL	189.7(9.59 %)	394.4(20.15 %)
INDUSTRIAL	65.32(3.30 %)	66.300(3.40 %)
COMMERCIAL	6.210(0.30 %)	11.350(0.60 %)
WATER BODIES	61.14(3.10 %)	61.140(3.11 %)
PARKS	63.70(3.20 %)	124.60(6.35 %)
PUBLIC USE	226.35(11.60 %)	226.350(11.6 %)
VACANT LAND	1398.13(69.5 %)	1072.95(54.8 %)
TOTAL AREA	1957.1(100.0 %)	1957.1(100.0 %)

NOTE : ALL DATA IS IN SQUARE KILOMETERS.

PROPOSED LAND USE IS BY H.U.D.A.

FIGURE F2.1

LANDUSE DISTRIBUTION
HYDERABAD URBAN DEVELOPMENT AREA



SOURCE:H.U.D.A.HYDERABAD
TOTAL AREA - 1957.1 Sq.Km.

TABLE T2.2
LANDUSE COMPOSITION OF HYDERABAD

LANDUSE	MUNCIPAL AREA			FRINGE AREA	
	1965	1973	1981	1973	1981
RESIDENTIAL	2694.27 (13.88%)	6735.67 (34.7%)	6793.90 (35.0%)	1662.45 (2.68%)	4193.16 (6.76%)
COMMERCIAL	197.52 (0.76%)	209.64 (1.08%)	346.18 (1.78%)	59.47 (0.09%)	73.51 (0.12%)
INDUSTRIAL	304.75 (1.57%)	500.81 (2.58%)	1941.11 (10.0%)	3803.60 (6.13%)	4573.20 (7.38%)
RECREATIONAL	770.62 (3.97%)	2573.92 (13.26%)	3439.00 (17.72%)	------	-------
PUBLIC USE	1015.72 (5.23%)	1052.48 (5.42%)	1747.34 (9.00%)	4626.59 (7.46%)	7812.60 (12.60%)
TRANSPORT	1294.72 (6.67%)	1434.48 (7.39%)	2329.34 (12.0%)	787.77 (1.27%)	3803.35 (1.29%)
AGRICULTURE	3462.94 (17.8%)	1750.84 (9.02%)	------	16680.40 (26.97%)	14562.86 (23.49%)
VACANT	9721.10 (50.08%)	5153.66 (26.55%)	2814.62 (14.50%)	34653.43 (55.90%)	29801.31 (42.90%)

SOURCE : H.U.D.A.'s data on land use.

NOTE : THE AREAS ARE IN HECTARES.

TABLE T2·3
DISTRIBUTION OF WORK FORCE HYDERABAD

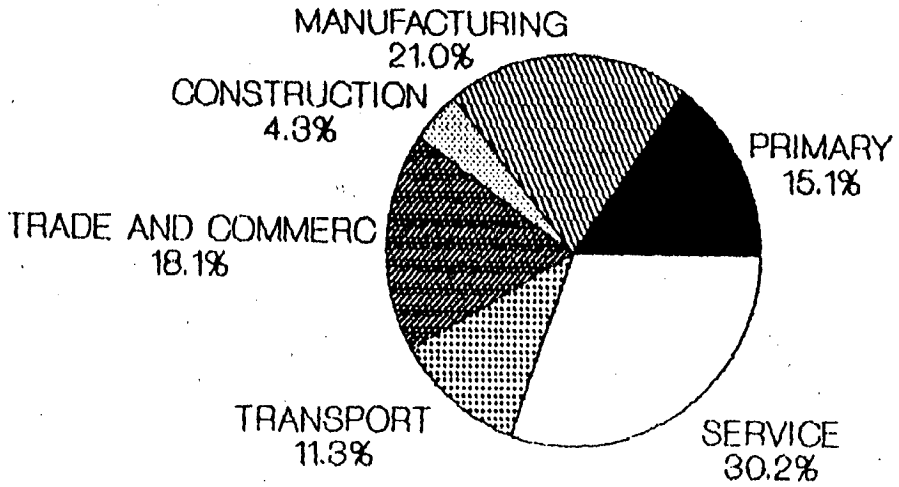
SECTOR	1911	1931	1951	1971
TOTAL	207.11	263.17	326.58	444.58
AGRICULTURAL	24.15	34.92	5.74	11.45
INDUSTRIAL	30.60	28.96	50.48	100.49
CONSTRUCTION	4.85	2.29	15.12	28.33
TRADE & COMMERCE	33.34	45.02	63.68	61.57
TRANSPORT & COMM.	11.42	32.98	25.96	102.67
SERVICES	102.76	119.90	165.68	148.07

SOURCE : CENSUS OF INDIA- HYDERABAD.

NOTE : ALL FIGURES ARE IN THOUSANDS.

FIGURE F 2.2

DISTRIBUTION OF WORK FORCE
HYDERABAD METROPOLITAN AREA
1971



SOURCE:Census Handbook - 1971.
Total work force - 633230.

CHAPTER - III

ATTEMPTED SOLUTIONS FOR THE PROBLEMS DUE TO INDUSTRIAL GROWTH A STUDY OF DELHI

Cities and Urban areas are dense collections of human activities including housing, jobs, recreation, transportation and public services knit together, providing essential services to the residences and worksites. With the emergence of factory system a never imagined need for materials, labour, capital and other facilities had arised. As cities proved to be more advantageous, the factories grew up in urban areas. The city building forces act in varying combinations of time, technological, political, social and economic forces in the society.

The lack of control and planning on the expansion of the cities would result in a variety of problems. Industry, is the major economic activity requiring plenty of man power, capital, services etc. Any sudden growth due to technological, political or other factors would bring in a variety of other requirements in the area failing which would result in chaos. Delhi is one such Metropolitan city, which had experienced a sudden spurt in industrial activity. [Refer Table 3.1, fig. 3.1].

Delhi was selected for the purpose of getting an idea of the problems due to industrial growth, the steps taken by the DDA in order to solve these problems and also to know the after effects of such corrections. As Delhi, had been already studied in detail, in this line of interest, ready availability of data and information of Delhi and many other reasons had led to the selection of Delhi for the purpose of the study.

3.1 Introduction To Delhi

Delhi was made the capital of India in 1911 and was declared as a Union territory in 1950. The large influx of population to Delhi due to the establishment of many offices in private and public sectors had assisted the industrial development. Delhi has good transportation link through rail, road and air. -- 5 railway lines, 5 national highways and 4 other roads converge at Delhi. All these factors were responsible for the growth of market at National and International levels.

Due to the fast expansion of Delhi, it had extended its influence in the states of U.P, Haryana and Rajasthan. This had resulted in the establishment of NCR region in 1985 the development of which is controlled by the NCR board.

3.2 Industrial Growth

Industrial growth of Delhi had only a sporadic growth from 1900 to 1940. The world war II gave fresh impetus to the process of industrialisation. The influx of refugees during partition of Pakistan had given impetus to industrial growth of Delhi. Delhi had still remained an administrative town till 1950, when it had only 45700 workers in the industrial sector. This is due to the lack of modernised industries in Delhi.

Delhi had experienced slow industrial growth till 1971 which turned rapid since 1975. The industrial growth of Delhi will have the following advantages :

1) Participation and contribution to National growth.

2) Capital generated from production in Delhi finds immediate expansion and reinvestment.

3) Industrial expansion provides jobs for more influxing migrating workers.

4) Diversification of the economy and easing of social tensions.

The industrial expansion of Delhi was mainly due to :

1) Nearness to the residence.

2) There are no restrictions for industrial development by the government.

3) Availability of developed infrastructure facilities for industries.

4) Availability of vast tracts of land at reasonable prices.

5) Ease of banking and financial facilities.

Most of the industries in Delhi get their raw materials from local market through wholesalers and brokers. Only Engineering units get the raw materials from distant places. The market for the products is mainly localised and in the immediate neighbourhood even though a substantial number of units market in distant places also.(Local - 76% ; Neighbourhood - 80% ; Distant - 35%). Majority of the units depend on road transport followed by the railways.

3.3 INDUSTRIAL STRUCTURE

The industrial structure of Delhi is as follows : [Refer Tables 3.2, 3.3].

1.NAJAFGARH INDUSTRIAL AREA - Developed in 1941 in West Delhi. It is the largest industrial district. The availability of railway siding led to the development of large scale industries and concentration of coal, petroleum and chemical units.

2.KALKAJI INDUSTRIAL AREA - Developed in 1955 in the South of Delhi. This is suitable for medium and small scale units free from nuisance.

3. OKHLA INDUSTRIAL AREA - Developed in South Delhi for the establishment of large scale units.

4. AZADPUR INDUSTRIAL ZONE - This is developed for light industries which are free from all types of nuisance.

5. ROHTAK INDUSTRIAL ZONE - This is developed for industrial and storage use. It is situated on the North-west of Delhi and accommodates nuisance causing industries.

6. SHAHDARA INDUSTRIAL ZONE - This accommodates nuisance causing industries and is suitable for industries requiring large areas.

7. SPECIAL INDUSTRIAL AREA - Near Safdarjung hospital in South Delhi area for the manufacture of high precision instruments is located for nuisance free industries.

8. URBAN VILLAGES - The industries and trades having rural character like pottery, tannery, cattle etc., are located in clusters of fringe villages.

9. SMALL SCALE INDUSTRIES - Mehpalpur road, Shahjahanabad are developed for small scale industries.

10. LIGHT INDUSTRIES - Motia khan, Anand Parbat are developed for light industries.

11. EXTENSIVE INDUSTRIES - Shamapur Badli is developed for extensive industries.

12. Other industrial developments are DLF Industrial area, Wazirpur, Kirti Nagar, Moti Nagar and Lawrence Road.

3.4 COMPARISON OF DELHI AND HYDERABAD

Delhi was selected as a case study for the thesis as it has a matched character with Hyderabad and has a parallel structure. Even though Delhi is much larger and more populated and also it is the capital of India while Hyderabad is a state

capital, it holds good for a parallel case study based on the following criteria for the study :

a] Both Delhi and Hyderabad are administrative capital towns.
b] They rank third and sixth in the Metropolises of India.
c] Both have good transportation link through road, rail and air.
d] The population growth in both the cities is due to the establishment of various government, private and other offices.
e] Industries started developing since 1940's in Delhi and since 1930's in Hyderabad. Rapid industrial development started since 1971 in Delhi and 1961 in Hyderabad.
f] The presence of good transport facilities led to the development of distant market for the products of both cities.
g] In Delhi industrial growth is most concentrated in the east while in Hyderabad it is towards the north.
h] The metal and engineering industries dominate the industrial scene of both the cities.
i] The availability of government subsidy, and development of industrial estates are the factors responsible for the development of industries in both Delhi and Hyderabad.
j] Delhi had extended its influence into the surrounding states and the National Capital Region was identified, while the area of influence of Hyderabad had been identified as The Hyderabad Urban Development Area.
k] Both Delhi and Hyderabad are located inland away from the seacoast and thus they do not have any sea trade.
l] River Yamuna flows through Delhi and River Musi flows through Hyderabad.

m] The employment is dominated by the service, commerce and the industrial sectors for both the cities.

n] Industries of both the cities are not raw material based and are only consumer oriented.

The main differences between Delhi and Hyderabad are :

a] The rate of population growth of Delhi is far above that of Hyderabad. This only makes the scale at which the problems are created in Delhi to be more than those in Hyderabad but the type of problems in the industry are similar.

b] Delhi being National Capital and Hyderabad being State Capital have a difference in the level of administration.

It was observed that the problems in Delhi and Hyderabad due to the industrial activity are similar. Easy availability of data and the availability of adequate information in the line of study as reports, surveys etc., are also responsible in selecting Delhi as Case Study.

The solutions given to the industrial problems and the reaction of the people in Delhi create a base for working out solutions with certain precision for the problems in the study area.

3.5 Problems Identified Due To Industrial Growth

1. Contamination of Yamuna waters due to mixing of untreated industrial effluents.
2. Air pollution was caused due to 55000 industrial units, 3 thermal power stations and also motor vehicles.
3. There are 83 water polluting units and 30% of them are present in non-confirming zones.

4. Noise pollution due to the industries and also heavy traffic movement.

5. Lack of proper landuse in relation to residential areas and the employment centres had resulted in excess transportation trips.

6. Heavy expenditure is incurred in the development of infrastructure facilities due to rapid expansion of the city and population increase.

7. Lack of proper infrastructure facilities in the surrounding villages where the influence is felt and is seen that 20% of the households are migrants.

8. Lack of proper housing for the labour population resulted in slums around industrial complexes.

9. Heavy commuter traffic resulted in the insufficiency of the public transportation system.

3.6 Proposed Solutions By D.D.A.

1. Pollution controls strictly enforced in the industrial areas like Najafgarh, Lawrence road, Wazipur, Kirti Nagar, Moti Nagar and DLP Industrial areas.

2. No new industrial units employing more than 50 workers would be permitted in order to control the population rise.

3. Shifting the polluting units located in non-conforming zones immediately to the zones identified for them.

4. Redevelopment of Anand Parbat and Shahdara for light manufacturing and Shamapur Badli for extensive manufacturing.

5. Setting up of 16 new industrial areas for light industries to meet the need for the next 20 years.

6. Augmentation of treatment plants in Okhla, Keshopur, Cornation, Rithala and Shahdara. And also setting up two new treatment plants in the west and North of the city.

7. By 2001, the city's water requirements is met from Yamuna, Giri and Tehri dams.

8. Control of vehicle exhaust, installation of Electronic precipitators for the thermal power stations and modernisation of highly polluting industries are suggested to control air pollution.

9. Shifting of Industries and workshops from residential areas. Green buffer and commercial activity along main roads, careful landuse planning with respect to air traffic are suggested as control for Noise pollution.

10. Diversion of discharges, treatment of discharges before entering Yamuna, extension of sewage system, making the polluting units in establishing treatment plants are the measures for protecting Yamuna waters from pollution.

11. Designing a landuse-transportation model that leads to 70% of the trips within various divisions thus reducing commuter traffic.

12. Providing reasonably high infrastructure and good road links to the rural suburbs.

13. Development of only light, small scale and household industry to be allowed and also the Extensive industry for which zoning regulations are framed.

14. Diverting the location of new & old polluting units to growth centres in ring towns, like Faridabad, Sonepat, Ghaziabad, Modinagar etc. and only allowing consumer oriented units in Delhi.

15. In residential areas units employing skilled labour and free from pollution only to be allowed.

16. Redevelopment and reorganisation of manufacturing activities in the central city.

3.7 Proposed Norms For The Location Of Industries

HAZARDOUS AND NOXIOUS INDUSTRIES

a] New units not permitted.

b] Existing units to be shifted within 3 years.

c] This vacated land used for community needs as per the Master plan.

d] Delhi administration takes action for their shifting depending on their pollution.

HEAVY AND LARGE INDUSTRIES

a] No new industries permitted within Delhi.

b] Existing units shall be shifted to Delhi Metropolitan region and National Capital Region as per the plans and policies.

c] Land vacated shall be used for community needs or for light and service industries.

d] Modernisation of existing units permitted if they reduce pollution and traffic.

EXTENSIVE INDUSTRIES

a] No new units except in the areas identified for them.

b] Existing non-confirming units shifted within 3 years into the zones identified for extensive industries.

LIGHT AND SERVICE INDUSTRIES

a] Non confirming with more than 20 workers shifted within 3 years to respective zones identified for them.

b] Non-confirming with 10 to 19 workers allowed to continue & are reviewed for allocation after 5 years. Chance is given for their relocation and for 9 workers allowed upto next 10 years.

HOUSEHOLD INDUSTRIES

a] Maximum of 5 workers permitted in residential areas. No pollutant unit is accepted as household industry.

b] Permitted only on ground floor upto 25% of floor space.

GENERAL CONDITIONS

a] Allocation of new plots for shifting units given on priority by the authority.

b] Suitable incentives for shifting.

c] Adhoc industrial licensing discontinued.

3.8 Objections To The Proposed Solutions And Norms

The following are the objections received from the industrial units in response to the shifting plan.

1. Shifting of incompatible industries lead to problems like

a] Problem of the labour employed in the units.

b] Losses incurred due to the large investments in the existing location, break in production and costs of reinstallation of the industry.

c] Longtime to be allowed for shifting of heavy machinery.

d] The non-hazardous licensed units be permitted even if they have more employment, land and power load.

e] Units catering to the city needs and operating before first five year plan be permitted to continue.

2. The industries also requested various incentives to shift which are as follows :

a] Use of vacated land as per the landuse plan.

b] New land to be alloted at concessional prices.

c] Compensation for the losses due to shifting.

3. Household pollution free industrial units may be permitted in residential areas.

4. The existing large scale units be allowed to continue if they undertake modernisation for environmental protection and housing for the workers.

3.9 Derivations From The Case Study - DELHI

1. The rapid population growth of Delhi had resulted in severe problems like housing shortage, traffic congestion, environmental pollution, insufficiency of infrastructure etc. In order to fight these problems, employment generating activities are tackled. The Industry, Central government offices and public sector offices, & wholesale and distributive trade and commerce have been identified as the major employment generating economic activities. Thus, the root cause is dealt with in order to solve the problem.

2. The National Capital Region (NCR) had been identified which comprises of Delhi and parts of the neighbouring states Uttar Pradesh, Haryana and Rajasthan. Priority towns are identified in NCR, which act as counter magnets absorbing all the diverted economic activity from Delhi, and help in its decongestion and also bring about balanced development of the region. The method of whole to part is used in planning the NCR.

3. Agriculture would be the major economic activity of NCR (80% of the total land and 50% of the total work force of NCR). The urban expansion of the priority towns of NCR is envisaged through rational utilisation of less valuable land. This provides self sufficiency in food and also preserves the environmental quality of the region.

4. The priority towns would be self regulatory in nature with developed urban facilities, strict pollution control, waste management, disposal and sanitation etc. The optimum size of these towns is predetermined to curb speculation.

5. The criteria for the diversion and shifting of Industries into the priority towns of NCR are :

a) The industries which doesnot serve Delhi but have come up due to the advantages from tax concessions, incentives etc., are to be shifted. This will reduce the unnecessary activity in Delhi.

b) Large industries, which are labour intensive are proposed to be shifted out of Delhi. This would reduce substantial number of inmigrants to Delhi.

c) The industries that are causing water and air pollution, smoke, noise etc., are proposed to be shifted out of Delhi. This enhances the environmental quality of Delhi.

6. Apart from Delhi, the Delhi Metropolitan area (DMA) towns (Ghaziabad, Faridabad, Gurgaon, Bahadurgarh, and Noida) are proposed to be discouraged from the development of waste problem creating industries. Industrial development outside DMA but within NCR is encouraged with incentives to bring about balanced growth of the region. Strict pollution treatment measures will be imposed in all towns of NCR. This would avoid problems due to uncontrolled growth in the future for the region.

7. Rapid mass transport system for NCR is proposed in order to decongest Delhi roads. This avoids loss of time in journey, avoid accidents, noise and air pollution. A Landuse-Transportation model would be developed for Delhi which minimises the transportation trips, about 70% of them would be within various zones. Hence, it saves fuel and time.

8. The shifting of Government and public sector offices from Delhi to the Priority towns of NCR decongests Delhi. This would lower the demand for the daily requirements and hence the manufacturing activity will be reduced.

9. The proposed uniform tax policy for the NCR would discourage the new industries from establishing in Delhi. Hence, this helps in decongesting Delhi and also reducing the manufacturing activity.

3.10 Application Of Planning Theories

LANDUSE TRANSPORTATION MODEL

A human settlement is composed of various activities like farming, living, working, relaxing, trading, education etc. Depending on the predominance of such a human activity, the landuse of the area can be termed as residential, Industrial, recreational, Commercial, Institutional, Agricultural, Public and Semi-public uses. Therefore, any urban area can be termed as the places where all these activities are knit together, to form an organised society.

Depending on the type scale and extent at which an activity takes place, other activities are restricted accordingly in that area. This results in the development of city structure. In order to negotiate the physical distance between the various landuses of a city by the people, there is a requirement for the adoption of a transportation means, the type of which is dependent on the size of the city.

In case of big cities, a lot of time is spent in movement, which has no productivity. So, in order to minimise this loss of time during travel, the city structure must be such that it must

generate least number of movements. This can be achieved by establishing a proper relation between the various landuses and the transportation system. Based on this a landuse-transportation was developed. This model works as follows :

1. The economy to be generated through the productivity of various activities would be assessed and calculated.
2. The scale at which various activities are required is then assessed based on a previous calibration.
3. From this the employment generation and the requirements of housing, utilities and facilities are calculated.
4. Based on the above results and depending on the standards, the land areas required for the purpose are calculated.
5. These are conveniently divided into smaller growth centres of optimum size so that majority of the transportation trips occur within these growth centres.
6. Accordingly, the landuse of a city or a region is determined.

The Landuse-Transportation model is most logical. Its success depends on the accuracy of future predictions and standards used in the model.

Delhi after experiencing rapid growth had become congested. It is having heavy commuter traffic due to the large area and lack of proper relation between various landuses. Delhi Development uthority had adopted to use the Landuse Transportation model to decide upon the future landuse of the region. 70% of the total trips generated would be within the various units into which Delhi would be divided.

DECENTRALISATION THEORY

The balanced development of a region requires the dispersal of various economic activities throughout the region. This phenomenon is called Decentralisation. The concentration of activities at a central point within a region will result in a variety of problems like congestion, pollution, insufficiency of utilities, sub-standard amenities and inadequate facilities. The situation results from an irreversible process of migration.

This situation can only be avoided by the control of population growth. The migrants can only be discouraged by curtailing the employment opportunities in the urban areas. So, in order to maintain the economic growth in the region, jobs should be created at various other points of the region.

Industry is the most important of all economic activities, as it raises the per capita income and standard of living at a faster rate. It also provides employment for a large section of workers both directly employing them or indirectly as supporting population. So, the industrial development of an urban centre would attract a lot of population from the surrounding areas creating congestion. This is avoided by applying the phenomenon of Decentralisation to Industrial Development.

Delhi had attained a condition of urban chaos due to its rapid and uncontrolled industrial development. This had resulted in problems like slums, squatters, pollution of air, contamination of Yamuna waters by the industrial effluents, noise etc. The master plan for Delhi 2001, had suggested all the future industrial growth of Delhi to the ring towns ie.,Faridabad, Sonepat, Ghaziabad, Modinagar, and also urban villages, thus, developing the National Capital Region.

The nuisance, hazardous, noxious and labour intensive industrial units are diverted to these ring towns where, they would be located in a planned manner. Only consumer oriented and nuisance free units would be allowed within Delhi.

TABLE T3.1

POPULATION VARIATION OF DELHI AND HYDERABAD

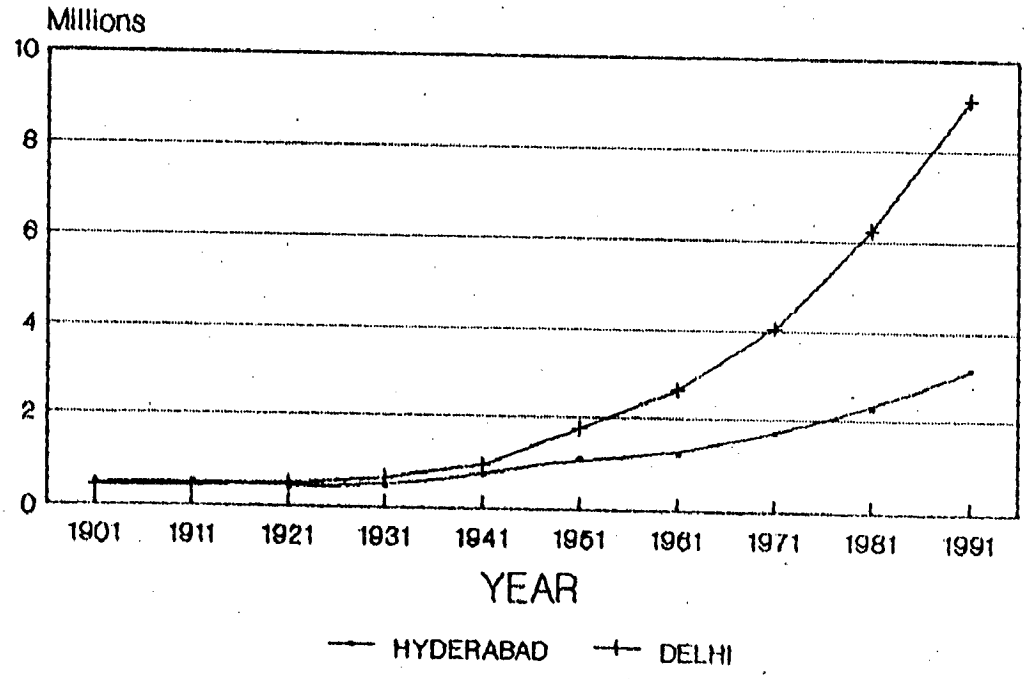
YEAR	DELHI	HYDERABAD
1901	4.05	4.48
1911	4.13	5.02
1921	4.88	4.85
1931	6.36	4.47
1941	9.18	7.28
1951	17.44	10.84
1961	26.58	11.91
1971	40.66	16.02
1981	62.20	22.61
1991	91.02	31.65
2001	128.18	——

SOURCE : CENSUS OF INDIA FOR DELHI AND HYDERABAD.

NOTE : ALL FIGURES ARE IN LAKHS.

FIGURE F 3.1

POPULATION GROWTH
HYDERABAD & DELHI



SOURCE:DISTRICT CENSUS HANDBOOKS.
OF HYDERABAD & DELHI.

TABLE T3.2
INDUSTRIAL COMPOSITION OF DELHI
1985

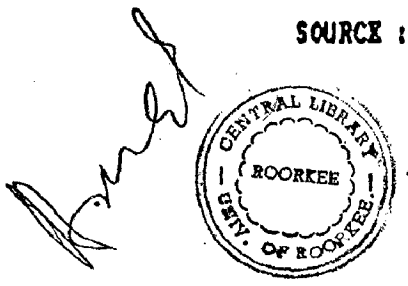
CLASSIFICATION	COMPOSITION
FOOD PRODUCTS	3.44 %
TEXTILE PRODUCTS	16.88 %
WOOD PRODUCTS	1.44 %
PAPER PRODUCTS	6.77 %
LEATHER PRODUCTS	12.58 %
NON-METALLIC PRODUCTS	3.14 %
METAL & ENGINEERING PRODUCTS	24.25 %
ELECTRICAL EQUIPMENT	11.78 %
TRANSPORT EQUIPMENT	14.88 %
OTHER INDUSTRIES	6.7 %

SOURCE : TOWN AND COUNTRY PLANNING ORGANISATION, NEW DELHI.

TABLE T 3.3
DISTRIBUTION OF WORKFORCE DELHI AND HYDERABAD

SECTOR	DELHI	HYDERABAD
POPULATION	4866000	1682000
WORKERS	1118000	518000
PARTICIPATION RATIO	3.6	3.3
AGRICULTURE	3.31 %	3.44 %
INDUSTRY	24.13 %	22.55 %
COMMERCE	25.82 %	25.73 %
TRANSPORT	9.48 %	13.46 %
SERVICE	37.84 %	34.82 %

SOURCE : Census of India for Delhi and Hyderabad



CHAPTER-IV

INTRODUCTION TO CASE STUDY - BALANAGAR

4.1 INTRODUCTION TO BALANAGAR

Balanagar falls under the Kukatpalli zone of HUDA's zonal classification of the Non-Municipal area. It is located towards the Northwest of Hyderabad at a distance of about 15 kms. from the city. The Bombay bound National Highway No.9 and the Medak State Highway pass through Balanagar. The Broad guage railway line to Bombay also passes through the area. This strategic location along the principal transport routes had led to the development of industries in Balanagar.

Balanagar is declared to be developed for industrial use in 1963. The establishment of Hindustan Aeronautics Limited in 1966 and The Indian Drugs and Pharmaceuticals Limited in 1967 under the public sector had given further impetus for the industrial growth of Balanagar.

Balanagar houses 423 industrial units which provide employment for 22000 industrial workers. The nearness of Balanagar to Hyderabad city and the frequent city Bus Transport facility had resulted in the development of a lot of interdependencies between Balanagar and Hyderabad.

The industrial growth of Balanagar had taken place due to the following reasons :

1. Good transportation facility through road and rail is available for the movement of raw materials and manufactured products.
2. The close proximity to the Hyderabad city, and good city bus transport had made easy for the movement of workers and others to and fro from the city.

3. Industrial growth of Balanagar was mainly due to the applicability of Central government incentives upto 1978 and the state government incentives upto 1980 for the industries to be located in Balanagar.

4. The Technocrat industrial estate was developed for job less technocrats, and was a result of the interest subsidy scheme of the state government.

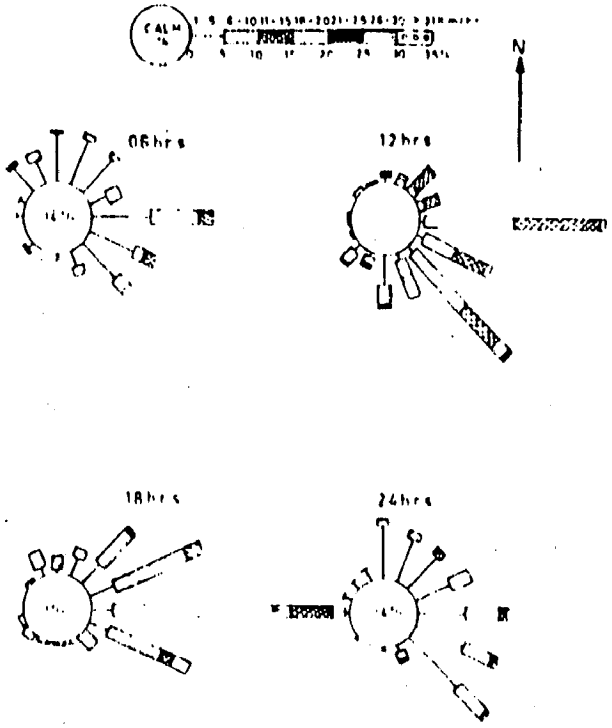
5. HAL & IDPL were developed in Balanagar under the public sector.

4.2 Demographic and Geographical Data

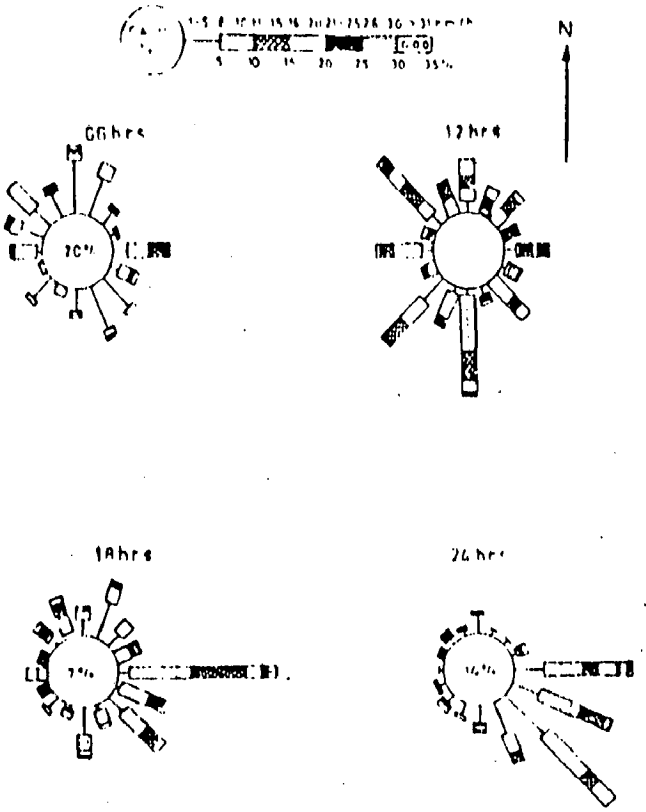
LATITUDE	-	17 22 North
LONGITUDE	-	78 27 East
ALTITUDE	-	1734 ft. above Mean Sea Level
WIND DIRECTION	-	WEST to EAST [Refer fig. 4.1].
MAX. TEMPERATURE	-	42.4 C
MIN. TEMPERATURE	-	9.1 C
RAINFALL	-	772.2 mm/year.
TERRAIN	-	ROLLING & gradually sloping from Northwest towards Southeast.

FIGURE F4.1
Atmospheric Wind Roses

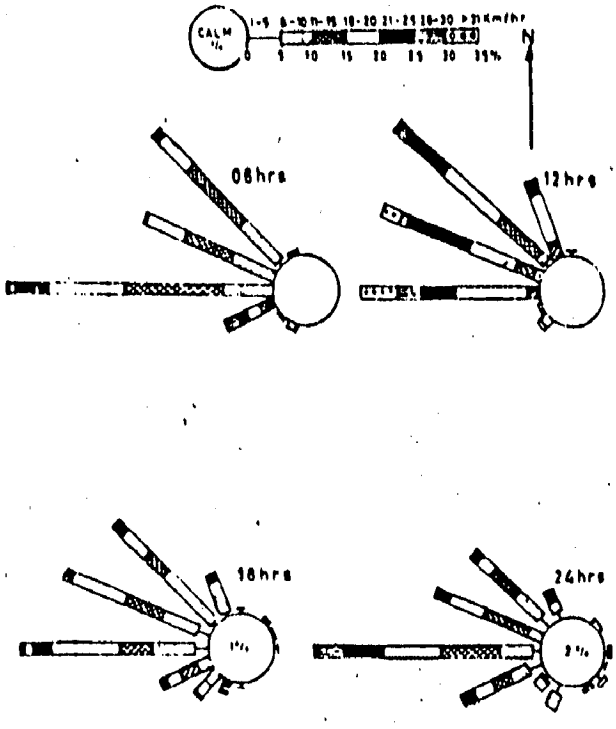
Hyderabad



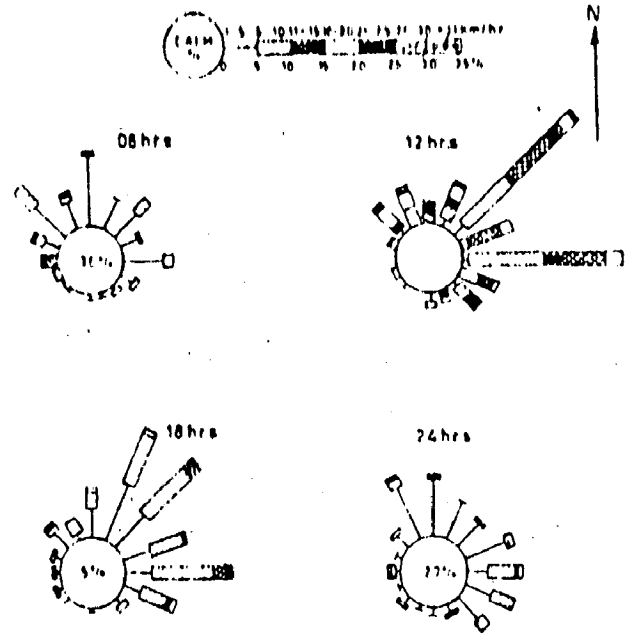
Wind roses for Hyderabad in January



Wind roses for Hyderabad in April



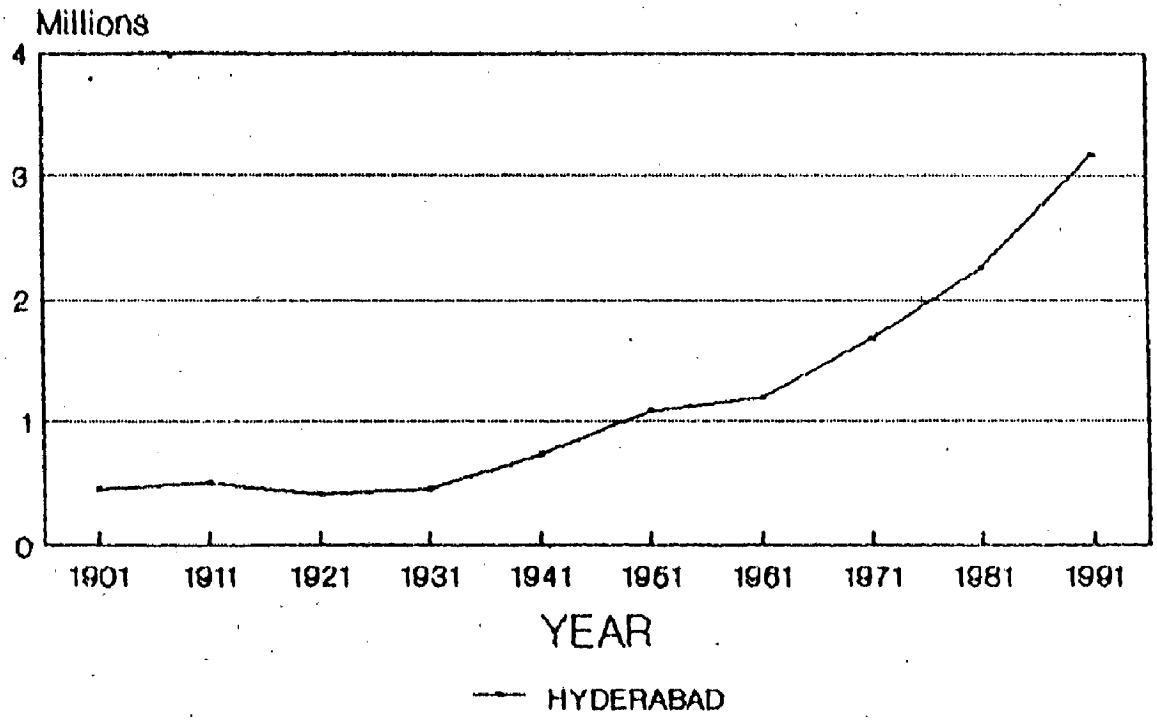
Wind roses for Hyderabad in July



Wind roses for Hyderabad in October

FIGURE F4.2

POPULATION GROWTH
HYDERABAD



SOURCE:DISTRICT CENSUS HANDBOOKS.
OF HYDERABAD

TABLE T4.1
POPULATION GROWTH OF HYDERABAD

YEAR	POPULATION	% INCREASE
1901	448466	-------
1911	502104	+ 11.95
1921	405638	- 19.21
1931	447398	+ 10.29
1941	720932	+ 60.94
1951	1003634	+ 42.59
1961	1191687	+ 9.97
1971	1682537	+ 41.16
1981	2260782	+ 34.39
1991	3164982	+ 40.00 (Estimated)

SOURCE : DISTRICT CENSUS HANDBOOK, HYDERABAD.

TABLE T4.2
COMPARATIVE POPULATION CHARACTERISTICS
(FIGURES OF 1981)

AREA	GROWTH RATE	DENSITY	SEX RATIO	% OF NON-AGRICULTURAL WORKERS
Total A.P.	23.09	195	975	29.94
Rural A.P.	16.76	151	984	23.24
Urban A.P.	49.53	3086	948	51.99
Municipal Hyderabad	36.07	12919	930	57.60
Urban Hyderabad	45.78	7071	918	98.23

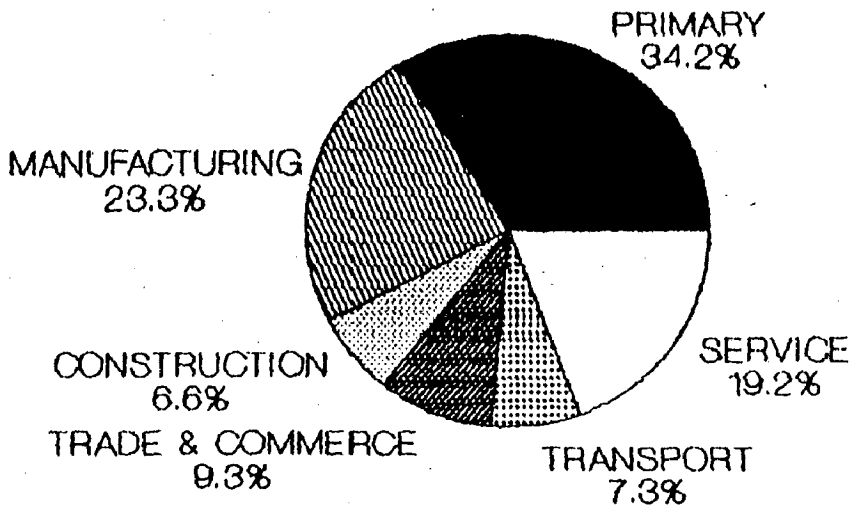
SOURCE : CENSUS OF INDIA 1981 - HYDERABAD.

FIGURE F4·3

DISTRIBUTION OF WORK F(

HYDERABAD FRINGE AREA

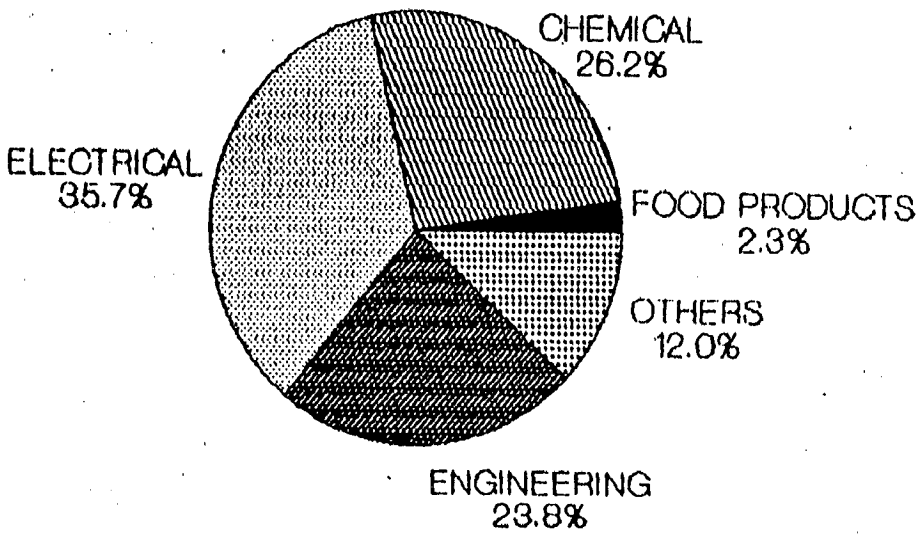
1971



SOURCE: Census Ha
Total work force - 6

FIGURE F4·4

EMPLOYMENT DISTRIBUTION
BALANAGAR



SOURCE: A.P.I.D.C. HYDERABAD
TOTAL EMPLOYEES-22000.

4.3 EXISTING LANDUSE

Efficient functioning of an area depends on the harmonious and well co-ordinated development of various landuses. The study area, Balanagar is 5 sq.km. in area. Almost all the land area is in developed form except for very small pockets of vacant land. The existing landuse of Balanagar can be explained as follows : [Refer figs.4.2,4.3,4.4, Table 4.4],

RESIDENTIAL Balanagar has Ø.9 sq.km. of residential area. This is spread in the residential townships of IDPL and HAL, and also other residential area. Balanagar has a total housing stock of 5ØØØ, with 1ØØØ houses in HAL and 85Ø houses in IDPL townships. These houses only provide for 17% of the total employees of Balanagar. Sub-standard housing also developed in the form of slums in open pockets of land and squatters as roadside dwellers.

COMMERCIAL Ø.12 sq.km. of land is covered under commercial use in Balanagar. Apart from the neighbourhood level shopping areas in IDPL and HAL townships, commerce exists along the strips of Bombay national highway. Commercial activity also takes place in temporary structures on the roadside. Hawkers and informal sectors also contribute substantially to the commerce, and developed along the side of the Bombay National Highway.

INDUSTRIAL Balanagar has 55% of its land under industrial use which covers 2.78 sq.km. The large scale units have their own developed areas for their factory. About 5Ø% of the medium scale units are provided sites in the Industrial development area. All the small scale and ancillary industries are provided with developed land in six industrial estates for the purpose.

RECREATIONAL Balanagar has only two cinema theatres-Shobana and Vimal along the Bombay National highway. These are the only places of recreation within Balanagar. The two townships of HAL & IDPL have their own model of recreation as parks, theatres, playgrounds etc. For other recreational facilities the people depend on the main city of Hyderabad.

PUBLIC AND SEMI-PUBLIC USE This category occupies the least area of land. Most of the offices, banks are present on the first floor level. There are six schools, two in each of the townships, two medical dispensaries and one public library. There are two research institutions - the Centre for Industrial Tool Design and National Remote Sensing Agency. There are five temples and are the only religious places.

TRANSPORT AND COMMUNICATION The main arteries of transport are Bombay National Highway running east-west and the Medak state highway running North-south. About 60% of the heavy vehicular traffic moves along the Bombay National Highway. The local commuter traffic moves mainly along Sanatnagar road and the Bombay highway. There are other local roads linking the individual industries and the industrial estates with the main artery skeleton.

WATER BODIES The Kukatpalli Nala is the only natural water body in Balanagar. Now-a-days, it is used to discharge the industrial effluents, into the Hussain sagar lake. It runs along the southern, eastern and western boundaries of the study area., It covers an area of 0.35 sq.km. of the study area-Balanagar.

OTHER LANDUSES Balanagar has no Agricultural land as the urban area has expanded further of it. There are some pockets of vacant land in Balanagar, a part of which is occupied by slums. The industrial estates for Medium and small scale industries also have scattered pockets of vacant land for their expansion program.

4.4 Industrial Structure Of Balanagar

The structure of any industrial development depends on various parameters for that area like its location, regional setting, raw material availability, market, transport network, infrastructural development etc. The type of industries, the scale of manufacture, number of units etc. all depend on the above factors. These lead to a sound industrial growth of an area.

The study area Balanagar is located in the Northwestern fringes of Hyderabad city and is well connected by frequent city bus service. The National and State highways provide good transportation outlet, due to which a strong market for the products had come up even at distant places. Its nearness to Hyderabad had led to the development of good infrastructure and other facilities and services.

Balanagar had been declared for industrial use in 1963. The Hindustan Aeronautics Limited in 1966 and the Indian Drugs and Pharmaceuticals Limited in 1967 were established in Balanagar under the Large scale public sector enterprises. This had given impetus to the development of ancillaries and other medium and small scale units.

units is marketed locally within the city. This would decide that the industries of Balanagar are consumer oriented units. This would exempt the market of the products of HAL & IDPL.

4.5 Impact of Balanagar Industrial Develpment On Hyderabad

Any development would have a zone of influence around it. Industrial development requires a lot of work force, infrastructural facilities, raw materials, market for the products etc due to which it would have an impact on the city and Vice-versa. This impact can be explained as follows :

1. Industry improves the economic condition of & area by creating job opportunities to the city dwellers, extra revenue as taxes, higher productivity of the area etc.
2. The needs of the city people could be met through local manufactauring activity, thus reducing the cost of transportation.
3. Industrialisation causes urbanisation of an area changing it from a socially cohesive unit to a community of Urban anonymity.
4. Occupational structure has changed from primary or agricultural activity to secondary and tertiary employment due to the rapid economic growth of the region.
5. The city provides the required facilities to the industrial workers like housing, recreation, education, medical and other services.
6. The city also provides banking, financial, accounting, guidance to entreprenuers and other specialised services.
7. The industries could get easy water supply, sewage system, road access, power etc., due to its nearness to the city.

Controversially, there may be some disadvantages which result mostly due to improper planning, mishandling things, over

concentration of industries, lack of control over development etc.

1. Due to various factors like housing shortage, inadequate facilities etc., in the fringes excessive dependency on those available in the city would result in straining the amenities of the city, heavy commuter movement, loss of time and money during movement etc.

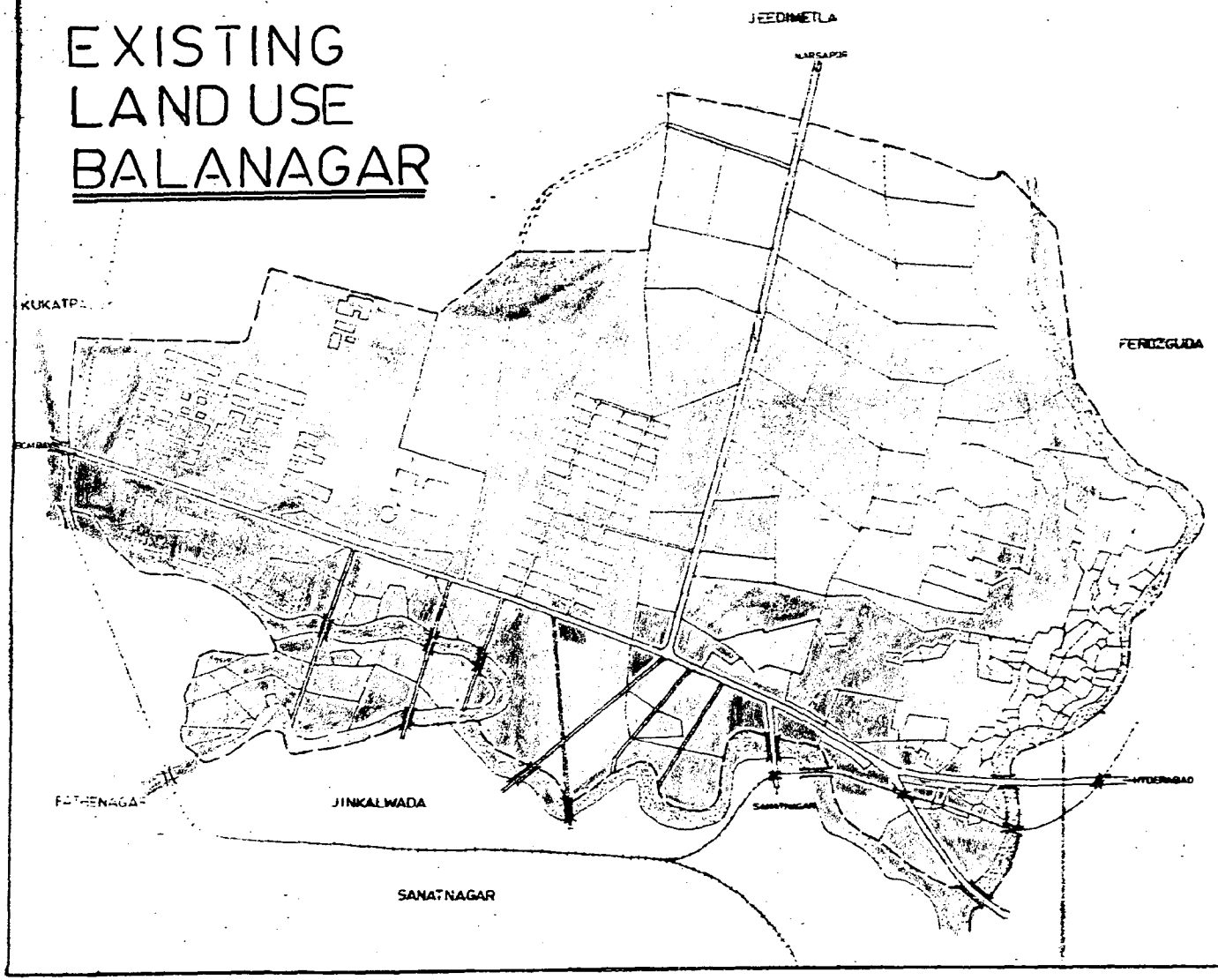
2. The Zig-Zag or ribbon development of industries in fringes would cause administrative difficulties to the authority.

3. Lack of proper pollution control measures for the industries in the fringes create problems of air, land and water pollution thus, indirectly causing health problems to the city dwellers.

4. Lack of sufficient housing for the labour class would create slums and squatters which cause various problems in traffic, expansion programs, health etc.

5. The city authorities would incur extra cost in the treatment of wastes produced by the industrial units.

EXISTING LAND USE BALANAGAR



LEGEND

BASE MAP - BALANAGAR

M.U.R.P. THESIS

H.U.D.A's PROPOSED LANDUSE - BALANAGAR

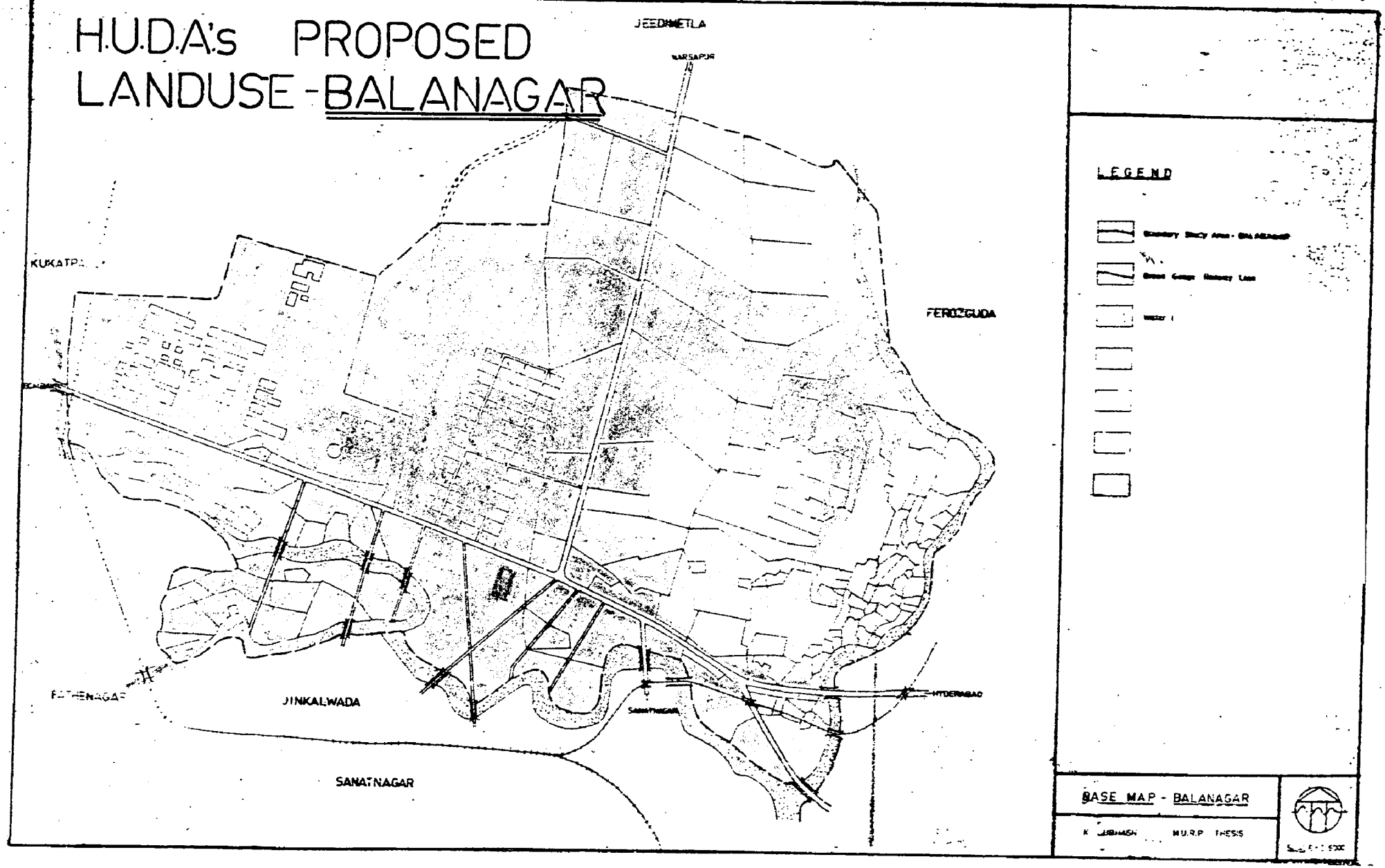
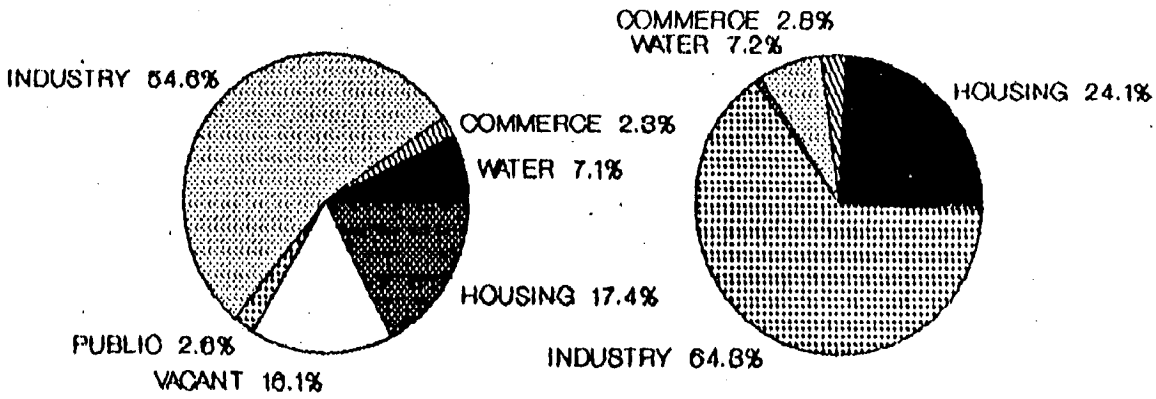


FIGURE F4.7

LANDUSE DISTRIBUTION
BALANAGAR



SOURCE:H.U.D.A.HYDERABAD
TOTAL AREA - 6.08 Sq.Km.

CHAPTER-V

ANALYSIS OF CASE STUDY - BALANAGAR

The performance characteristics and the scale of activities of an industrial area depends on its location with respect to an urban centre. The characters like traffic, housing, commerce, recreation, etc., are influenced by its distance from an urban centre. Balanagar is developed as an industrial fringe of Hyderabad city in 1963. It falls under the Kukatpalli zone of the classification of the Hyderabad Urban Development Authority.

Balanagar is bounded on the

EAST - Ferozguda

WEST - Kukatpalli

NORTH - Jeedimetla &

SOUTH - Sanatnagar.

The Kukatpalli nala bounds the south, north and eastern borders of the study area. Apart from the industrial landuse there are also residential, commercial, recreational, public and semi-public uses.

5.1 Housing

Housing constitutes a very important component of an urban area. Although, there are several problems of housing confronting us at national level, the housing problems emerging in the industrial towns are more pronounced. These are due to the inadequacy of residential accommodation for its employees and lack of an agency.

to undertake development for the private population.

The management of the industrial units is responsible for providing housing for its industrial employees near to the factory. The constant influx of population in search of jobs would settle down haphazardly, and hence create unmanageable problems.

For example, Balanagar provides employment for 22000 industrial workers and 8000 workers in supporting and service sectors. The townships of IDPL & HAL provide housing for 850 and 1000 of their employees respectively. The residential development of Balanagar provides housing for another 2950 families. The rest of the workers commute to Balanagar from Hyderabad and surrounding villages. The inadequacy of housing within Balanagar resulted in thousands of industrial employees coming from Hyderabad city.

LIVING CONDITION The living conditions in residential areas are not only governed by the quantum of land but also on the total environment, the quality and quantity of housing, degree of provisions of services and amenities etc.

In Balanagar, the IDPL & HAL townships provide good housing quarters for their workers. They have well developed infrastructural services. The IDPL township has a density of 53 persons/acre and the HAL township 88 persons/acre. The overall net residential density of Balanagar is 100 persons/acre and a gross density of 15 persons/acre.

The residential development of Balanagar can be termed as medium or average living area. Some areas of Balanagar can be characterised as overcrowded with katcha and dilapidated housing, unhygienic conditions, lack of basic amenities etc. The slum developments in the open pockets of land and along the roadsides

are occupied by Khokas and Jhuggies. These are present along the Bombay national highway and can be termed as sub-standard housing. The labour population that have come in search of work in the industries and also in the service sector who are economically poor constitute the slums and squatters.

5.2 Traffic And Transportation

In any industrial town, transport plays an important role for smooth operation of different activities especially production. The distance between work centres, recreation, commercial, educational area etc., and the residential area are linked by the transportation mode. It allows for the local choice of living, work and relaxation by the people. Thus, transport is a vital and crucial elements in the development and operation of any urban complex.

5.2.1 REGIONAL TRANSPORTATION

Balanagar is well connected by rail and road with Sholapur, Poona, Bombay, Medak etc. The broad guage railway to Bombay passes through Sanatnagar Railway station at about 2 kms. from Balanagar. Out of the three modes of Transport namely - Road, rail, and air, road transport plays an important role while railways come next. About 90% of the goods produced and raw materials required are transported by trucks and only 8% is shared by the railways. The air transport is also used but is very rarely.

5.2.2 LOCAL TRAFFIC

Balanagar being located very close to Hyderabad and Secunderabad has a very high degree of commuter traffic. This is for various purposes like working, education, medical, recreation, business and other allied purposes. There is a good frequency of city bus transport to Balanagar from Hyderabad.

The traffic that plies within Balanagar is to link the various activities and also for the transport of goods within the industrial area for which cycle rickshaws, auto trolleys etc., are used.

5.2.3 TRAFFIC TERMINALS

The city buses that run through Balanagar are run by Kukatpalli Bus depot at 2 kms and Jeedimetla Bus depot at 6 kms. There is no terminal point for trucks and the loading and unloading of goods into trucks is done by parking them before the gates of the factories on the road side. Auto trolleys and mini lorries used for the transport are parked on the sides of the road. The Sanatnagar railway station at a distance of 2 kms. is the railway terminal serving Balanagar. The Begumpet Airport is at a distance of 7 kms. from Balanagar.

5.3 TRADE AND COMMERCE

After the establishment of IDPL & HAL factories in Balanagar, industrial activity has gained momentum during the last two decades. This created a favourable climate for increased commercial acitivity in Balanagar. The townships of IDPL & HAL have commercial activity at neighbourhood and townships level.

The commercial activity in Balanagar had developed along the Bombay National Highway. Due to the demand for cheap products, informal sector had also developed on the roadside of the national highway in a haphazard manner but in substantial amount. There is no organised vegetable market in Balanagar but for some shops in temporary structure along the highway. This created irregular development of shopping areas.

5.4 Infrastructural Facilities

The services and amenities which are an integrated part of an urban community for the expansion of economic and social life are termed as infrastructure. These are responsible for the performance standard of an area and are effected by the close proximity of an urban centre.

These include housing, transport, power, shopping, educational, medical and recreational facilities.

5.4.1 POWER

Balanagar is served by one electric sub-station. Street lighting is provided all along the major and minor roads and also roads within the industrial estates and townships. The HAL & IDPL townships have their own maintained street lighting facility.

5.4.2 EDUCATION

Balanagar has six primary cum nursery schools, two junior secondary and one secondary schools for education apart from two more primary schools in the HAL & IDPL townships. For higher levels of education people depend on the institutions of Hyderabad city.

There are two research organisations in Balanagar. The National Remote Sensing Agency (NRSA) with 500 employees and the Central Institute of Tool Design (CITD) with 200 employees which also imparts post graduate courses in tool design.

5.4.3 HEALTH

Balanagar has one dispensary, one health centre and four private clinics to meet the requirements of minor health problems. For higher order of medical facilities people go to Hyderabad. The IDPL & HAL townships have their own hospitals.

5.4.4 RECREATION

There are two cinema theatres in Balanagar. Apart from this there is no other means of recreation like parks and playgrounds excepting those present in the townships.

5.5 Amenities and Services

The preservation and enhancement of pleasing and aggreable urban environment through technical improvements to increase the pleasantness of life are called amenities and services. These include water supply, sewage disposal system, police and fire protection, postal and telephones

5.5.1 WATER SUPPLY

The treated water supply by the Kukatpalli muncipality partially serves the water requirements of Balanagar. Ground water is also used through bore wells by most residents and also by the individual industrial units. The Industrial estates and large industries have their own pumping and water supply systems. The townships of IDPL and HAL also have their own pumping, treatment and supply arrangements.

5.5.2 SEWAGE DISPOSAL SYSTEM

The domestic and storm water drainage are carried in open surface drains and are discharged into the Kukatpalli nala. The IDPL & HAL have their own underground sewerage system and treatment plants for their industrial and domestic effluents. They discharge their final effluent into the Kukatpalli nala and the K-main sewer line. All other industrial units discharge their industrial effluents into the Kukatpalli nala and the K-main sewer line.

The K-main was commissioned in order to carry the effluents from various industrial units and avoid the pollution of Kukatpalli nala. But, due to its insufficient carrying capacity and also due the poor maintenance it was found to be ineffective thus, the pollution of the nala remains unchecked.

5.5.3 POLICE AND FIRE SERVICE

There are one police station and one fire station in Balanagar to provide protection. The fire station is located within the industrial area so that it canextend immediate help to the industrial units in case of accident. Apart from this the individual industrial units have their own protection personnel.

5.5.4 POSTAL AND TELEPHONES

Balanagar has four small and one big post office cum telegraphic exchange and the telephone facility is extended by the Kukatpalli Telephone exchange.

5.6 Report On The Survey Of Balanagar - Conducted By The Author

The survey of the case study area is done to know the facts and figures existing in Balanagar. The proforma is so designed that it would give a fair idea about the industrial activity in the area, workers and their related information about housing, facilities etc. As it would not be possible to survey all the industrial units of Balanagar, a random selection had been done. All the three large scale units, fifteen out of seventy five Medium scale units and thirty out the three hundred and forty five small scale units were surveyed.

The survey would provide information regarding the line of production, ownership, reasons for establishing in Balanagar, details of employees, their origin and housing, communication means of the employees to the factory, transportation means used by the industries for the movement of raw materials and finished products. It also gives an idea of the number of lorries coming to the industries, the type of wastes produced, their collection and disposal, the measures taken by the individual industries to curb the problem of pollution from their processing method etc.

The following are the reasons expressed by the industrial units for establishing in Balanagar :

1.Ready availability of developed land at concessional rates.

2.Availability of good transportation link through rail and road.

3.Nearness to the city which provides specialised facilities and also proximity of customers.

4.Availability of infrastructure facilities required for the industries.

5.The central and state government incentives like loans, subsidies etc., for those units established in Balanagar.

6.Presence of developed land for coming up as ancillary units near to the parent industrial units.

7.Easy availability of labour force from the surrounding areas and raw materials.

8.Balanagar is identified under the backward area development program due to which various benefits of tax, interest on loans etc., are available for the industrialists.

Most of the units in Balanagar are established in Balanagar but for only two reported shifting from other areas. These two units have shifted due to the presence of developed space for industries in Balanagar. As there is no much competition for space 95% of the units only have ground level activity except 17 units have two or more levels.

Balanagar provides employment for about 22000 industrial workers and another 8000 in the commerce, service and other secondary activity. This would sum up to a total of 30000 workers. 80 to 85% of the workers are migrants, the rest are from the surrounding villages and Hyderabad. The large scale industries employ workers from all over India while the Medium scale units get from distant towns within the state. The small scale units totally depend on the local labourers that include the migrants also. Two units requiring specially skilled labour, reported to get their labour force from Bihar and Madras.

Only 16% of the workers reside within Balanagar while 47% stay in the main city of Hyderabad. The rest 37% come from surrounding villages. The HAL & IDPL have townships which have 1850 housing quarters for their employees. There are about 2950

houses in the residential area of Balanagar and around 200 workers live in the slums and squatter settlements in Balanagar.

About 55% of the industrial workers reach their work place through the city bus transport and another 20% come by factory vehicle, the rest 25% travel by personnel vehicles like scooters, cycles and cars. 20 buses are run by HAL and 25 by IDPL in order to transport their workers to the factory from the city.

All the industries of Balanagar had reported the origin of raw materials at distant places. Specialised brokers deal with getting the raw materials. Five units reported the use of imported raw materials and only fourteen units depend totally on locally available raw material. These come under the associated and ancillary industries.

All three large scale units market their product at distant places and 5% is exported. 70% of the product from Medium scale units is marketed non-locally while 5% is exported and the rest 25% is locally marketed in the local industries and other consumers. The small scale units are totally based on local market as most of them work as ancillaries to other industries and 85% of the product is marketed locally. So, it can be concluded that the industries of Balanagar are mostly consumer oriented.

The contribution of air and railway transport for the movement of raw materials and finished products is about 10% of the total requirements. The rest 90% is met through road transport. 600 trucks are used to meet this transport requirement of Balanagar industrial area.

None of the factories had reported production of any pollutant as by product. But the facts, reveal that the pollution of air and water is considerably high. Even though the IDPL and other drugs and chemical industries report the presence of pollution control for their units, the polluted environment had reflected the absence of proper controls.

Balanagar has a majority of Engineering units, the solid waste of which has scrap value. They do not produce toxic liquids but pollute the atmosphere with suspended particles of smoke. These units produce noise from heavy machinery. The IDPL, HAL and the ICI have effluent treatment plants. The liquid effluent produced from the chemical, and food industries is let out untreated into the Kukatpalli nala.

There are 5 metal processing units producing slag as a by-product, about 50% of which is used in raising the level of land. The rest along with other solid wastes and garbage is dumped in open ground. These wastes produce toxic liquid when they decompose which pollutes the ground water through percolation. Toxic smells cause discomfort in the area, which are produced by the chemical, drugs and pharmaceutical plants.

From the above information, the following inference can be drawn about Balanagar.

1. The industries of Balanagar are consumer oriented.
2. There is no proper relation between the workplace and housing for those working in Balanagar.
3. Heavy commutation had resulted in the heavy rush for city bus transportation system.
4. Most transport requirements of Balanagar area is met through road transportation.

5. The major problem is water pollution followed by air.

6. New units in large and medium scale sector cannot be located anymore in Balanagar industrial area.

Apart from the above, the industries also reported some problems faced by them like :

1.Shortage of power supply.

2.Lack of proper infrastructure facilities.

3.Bad conditions of road and drainage system.

4.Insufficiency of public transportation system.

5.Foul smell from the chemical and other units causing sickness.

6.Polluted groundwater that cannot be used for manufacturing activity.

7.Congestion on the roads due the mixture of local and regional traffic.

8.Lack of any further developmental program for the improvement of Balanagar.

TABLE T5.1
INDUSTRIAL CLASSIFICATION OF BALANAGAR

SECTOR	LARGE	MEDIUM	SMALL	TOTAL
FOOD PRODUCTS	0 (0)	2 (450)	11 (150)	13 (600)
CHEMICAL	1 (5000)	15 (600)	69 (1150)	85 (6750)
ELECTRICAL	2 (5100)	23 (800)	54 (2300)	79 (9200)
ENGINEERING	0 (0)	29 (1600)	161 (2750)	190 (6150)
OTHERS	0 (0)	6 (500)	50 (600)	56 (3100)
TOTAL	3 (11100)	75 (3950)	345 (6950)	423 (22000)

SOURCE : A.P.Industrial Development Corporation.

NOTE : The classification is based on the investment in plant and machinery.

The figures in brackets show the total employees in that class of industry.

CHAPTER-VI

STRATEGIES FOR THE INTEGRATED DEVELOPMENT OF BALANAGAR INDUSTRIAL AREA

6.1 Requirements Of An Industrial Area

Balanagar industrial area is situated on the fringes of Hyderabad city. It is controlled by the Kukatpalli Muncipality. However, it is very much dependent on Hyderabad city for various purposes like Housing, shopping, education, medical and recreation. For an efficient integrated fringe industrial development following requirements are to be met :

1) Availability of less expensive land.

2) Facilities for the disposal of industrial wastes.

3) Nearness to market, ancillary and associated industries.

4) Nearness to source of raw material for weight loosing industry.

5) Availability of services like power, water, sewerage.

6) Availability of skilled and unskilled labour at reasonable rates.

7) Presence of good transport facility for the movement of raw material and finished products.

8) The presence of suitable topographical features like firm soil, good drainage, level ground etc.

9) Land for the housing of industrial workers must be available nearby.

10) The industries must not develop on good agricultural land.

6.2 Proposals For The Development Of Balanagar

For an integrated development of Balanagar with Hyderabad city the following proposals are recommended to be adopted for the future growth of Balanagar. [Refer figs. 6.1, 6.2 & Table 6.1].

6.2.1 HOUSING

It is proposed to develop new residential areas in the vacant lands of Balanagar and also increase the residential density of the HAL & IDPL townships. This would increase the land area under residential use from the existing 220 acres to 380 acres.

The residential densities of the colonies was proposed at 160p/acre at four storey development. This would raise the population residing in Balanagar from 25000 to 62350.

	EXISTING	PROPOSED
i) IDPL township		
Area (acres)	80	85
Density (p/acre)	53	160
Population	4250	13600
Housing	850	2720
ii) HAL township		
Area	60	100
Density	88	160
Population	5000	16000
Housing	1000	3200
iii) Sector I		
Area	70	84
Density	200	160
Population	13750	13500
Housing	2750	2700
iv) Sector II		
Area		84
Density		160
Population		13500
Housing		2700
v) Neighbourhood		
Area	10	25
Density	200	160
Population	2000	4000
Housing	400	800
TOTAL AREA	220	380
NET DENSITY	114	160
TOTAL POPULATION	25000	62350
TOTAL HOUSING STOCK	5000	12470

6.2.2 INDUSTRY

1. It is proposed not to allow the establishment of any new manufacturing industry which employs more than five workers within the study area. This decision would help in stabilising the population of Balanagar and hence, giving chance for its improvement.

2. The small scale industries located in the residential zone are proposed to be shifted into the existing industrial estates. This avoids noise, traffic, smoke etc. in the residential area. Twenty one industries are identified and the estates contain 28 unoccupied plots in which they can be accommodated.

3. No major program of expansion of large scale units is allowed within Balanagar as this would attract large number of working population and thus related activities.

6.2.3 COMMERCE

1. New commercial development is proposed along the main artery thus, making it the main shopping centre for Balanagar. This proposal would raise the land under commerce from 18 to 25 acres.

2. Shopping at neighbourhood level is proposed in the new residential development. This would meet the daily needs of the neighbourhood population. (Sector I, Sector II and Neighbourhood). The standards are enclosed in Appendix 3.

3. The shopping in IDPL & HAL townships is proposed at one acre each.

6.2.4 CIRCULATION

It is proposed to segregate the local traffic and regional traffic flowing on the Bombay National Highway No.9. The fast regional traffic is proposed to be diverted out of the road stretch passing through Balanagar.

1) An elevated road bridge of 15 m. right of way is proposed which would by-pass the through traffic from entering Balanagar. This avoids traffic congestion and problems due to mixed traffic.

2) The heavy traffic from the Medak state Highway is diverted onto the proposed roadbridge by converting the existing Kutcha road to pucca road of 50 m. r/w. This would by-pass the through traffic from the market area of Balanagar.

3) The development along this new road has to be controlled by only allowing only the coming up of small scale industrial units and avoiding the development of informal sector.

4) It is proposed to strictly prohibit the loading and unloading activity on the roadside and is restricted to within the premises of the factories.

5) Three parking lots are proposed in the industrial area to accommodate the trucks, auto trolleys and mini lorries. This will ensure full utilisation of road capacity and the right of way is made free from obstructions by clearing the unauthorised encroachments on the roadside.

6) It is proposed to repave the roads as they are in bad condition. Seperate tracks are proposed to be provided for the movement of cycles and rickshaws.

6.2.5 RECREATION

Parks and playgrounds are proposed for recreation at the town and sector levels. The IDPL & HAL have already sufficient area for parks and playgrounds. The Buffer zones can be used for the purpose without changing its character.

1. 15 acres of land is proposed to be developed for parks, playgrounds and community centres in Sector II.
2. 10 acres is identified for the purpose in Sector I.
3. 3 acres is provided for primary school, shops and parks in the neighbourhood.
4. 20 acres of land is proposed to be developed for parks and playground as a recreational area at the town level for Balanagar on the banks of the Kukatpalli Canal.

6.2.6 ENVIRONMENT

1. A new effluent treatment plant is proposed. This would treat the effluents of small and medium scale industries that do not have treatment systems. This protects Kukatpalli nala from pollution and also avoids land and groundwater pollution in the region. This would also treat the domestic effluent.

2. 40 acres of Green buffer zone is proposed to be developed along the National Highway out of the right of way and also seperating the industrial and residential areas. This would absorb noise and also act as breathing spaces for Balanagar.

3. It is proposed to redesign the K-main to carry higher volumes of discharges from the Balanagar area. This will protect the waters of Kukatpalli nala and Hussain sagar lake and brings back acquatic life.

4. In order to avoid slums and squatter settlements housing for the economically weaker sections is proposed. This would provide complete sanitation in Balanagar.

5. Technical improvements in the storage and manufacturing processes of industries is proposed to avoid air pollution from smoke, toxic gases and smell.

6. A scheme for the management and disposal of solid industrial waste is proposed to be developed for the region after detailed study of the characteristics and quantum of wastes from various industries of Balanagar. This avoids the problems due to open dumping.

7. Strict pollution control measures are proposed to be imposed on all the industries of Balanagar for a safe environment.

6.2.7 PUBLIC AND SEMI-PUBLIC USES

The following proposals are made to meet the educational, medical facilities and other amenities of Balanagar.

1. 10 acres of land is proposed to be developed for Primary and Secondary schools, Health centre and other public uses in each of the sectors. Two acres is reserved for the purpose in the neighbourhood.

2. 60 acres of land is proposed to be developed for education, hospital and other public purposes.

Primary cum Nursery Schools	30 nos.
Secondary Schools	10 nos.
Health Clinics	6 nos.
Health centres	3 nos.
Hospital	1 nos.
Post offices	8 nos.

6.2.8 AMENITIES & FACILITIES

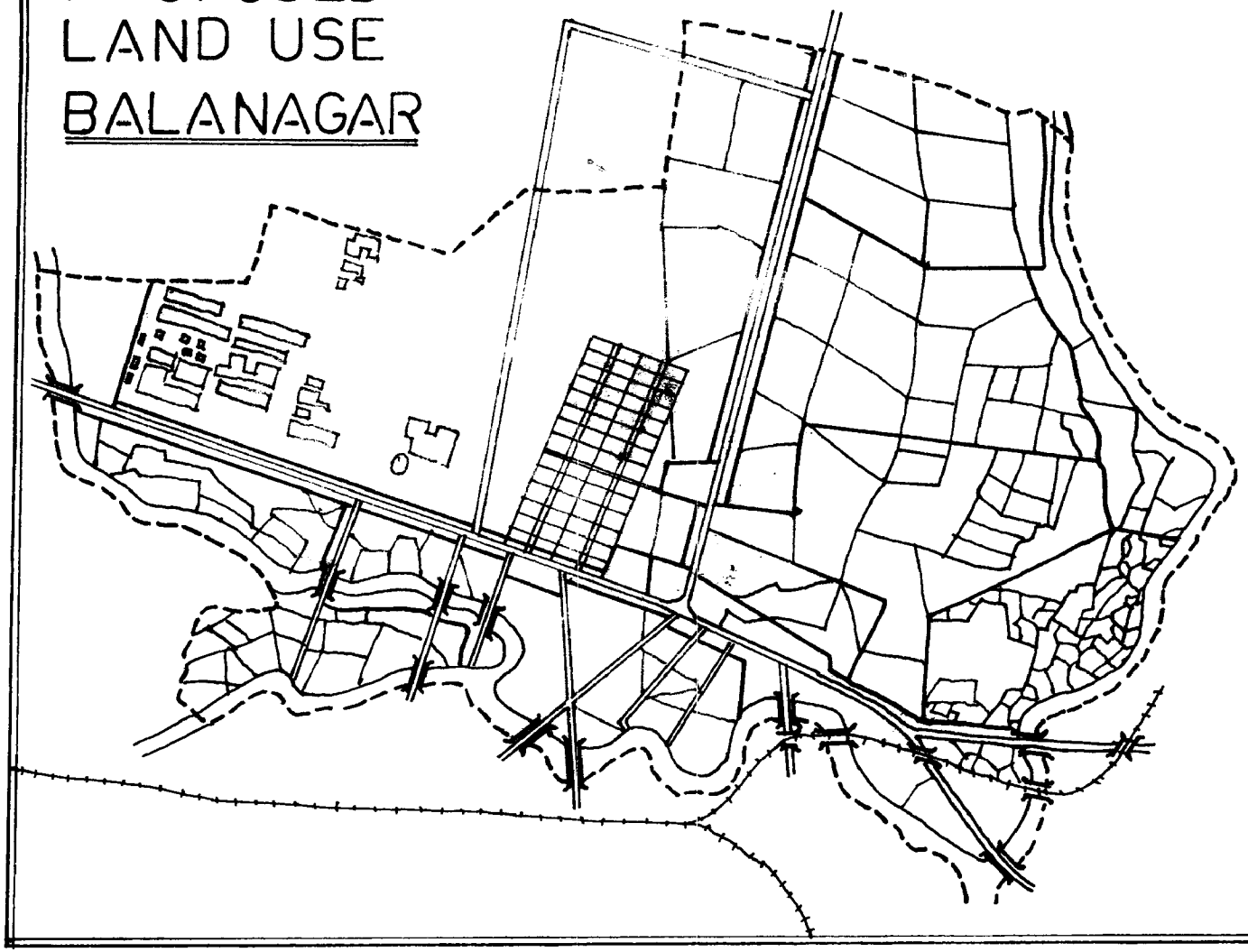
1. It is proposed to develop the water supply to a capacity of two MGD at a standard of 135 lt/head/day for domestic use.

2. The industrial requirements vary on the type of industry, depending on which the water supply system is to be designed.

3. Facilities like toilets, waste collection and street lighting etc, are proposed at public places like markets, parks and other recreational areas.

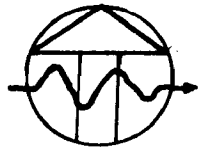
4. Domestic underground sewerage system is proposed to be developed at a standard of 100 lt/head/day of effluent. A seperate sewerage system is proposed to carry the industrial effluents.

PROPOSED LAND USE BALANAGAR



LEGEND

Total area	5·08 sq·km.
Residential	30·04 %
Industrial	45·00 %
Commercial	02·70 %
Water bodies	07·00 %
Recreation	05·20 %
Public land	02·20 %
Green buffer	07·50 %



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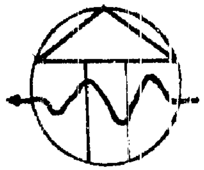

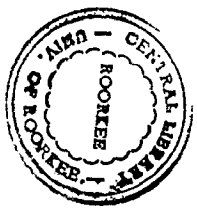
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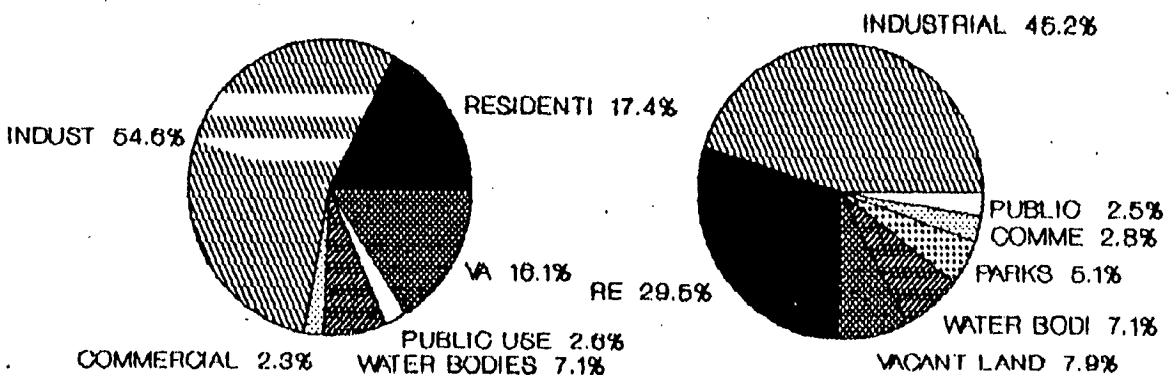
TABLE T6.1
LAND USE PATTERN OF BALANAGAR

LAND USE	EXISTING	PROPOSED
RESIDENTIAL	0.887(17.3 %)	1.50(30.40 %)
INDUSTRIAL	2.780(55.0 %)	2.30(45.00 %)
COMMERCIAL	0.117(2.20 %)	0.140(2.70 %)
WATER BODIES	0.360(7.00 %)	0.360(7.00 %)
PARKS	0.000(00.0 %)	0.260(5.20 %)
PUBLIC USE	0.130(2.46 %)	0.120(2.20 %)
VACANT LAND	0.82(16.04 %)	0.400(7.50 %)
TOTAL AREA	5.00(100.0 %)	5.00(100.0 %)

NOTE : ALL DATA IS IN SQUARE KILOMETERS

FIGURE F 6.2

EXISTING AND PROPOSED LANDUSE - BALANAGAR



EXISTING LANDUSE PROPOSED LANDUSE

CHAPTER-VII

CONCLUSIONS AND RECOMMENDATIONS

7.1 FINDINGS OF THE STUDY

Based on the study and analysis of Balanagar conducted the following are the findings of the study :

1. Majority of the industries in Balanagar including Hyderabad have neither a base for raw material or local demand. They were established only due to the policies and programs of the Central and state governments ie., the growth is entirely due to the pull factor.

2. 37.Ø % of the large and medium scale industries of the state are located around Hyderabad metropolitain area. The share of capital investment of the industries of Balanagar is 7.5% of the total capital investment in Hyderabad. Balanagar provides employment for 16.5% of the total industrial workers of Hyderabad.

3. The increased economic activities in the fringe areas like Balanagar, had transformed its landuse pattern from predominantly agricultural use to Industrial, residential & institutional uses. This considerably increased the land values by ten times in the region. Participation rate in fringe areas like Balanagar is higher compared to the corporate limits.

4. The households and industries in Balanagar depend on ground water source which is polluted by the seeping in of untreated industrial effluents through the canal base. This is causing health problems.

Therefore, it is observed that, water supply would be the main constraint for the future development of Balanagar.

5. Due to the absence of housing for the economically weaker sections in fringe areas like Balanagar, the unskilled labour in manufacturing sector are settling down in unauthorised settlements near to their work places forming slums and squatters.

6. Balanagar industrial area is creating environmental problems for the city as well as other adjoining areas. The polluted air is effecting Secunderabad area and the untreated effluent is being discharged into Hussain sagar lake through the Kukatpalli nala. causing unhealthy environment around Hussain sagar lake which is the only recreational body with water front in the twin cities.

7. Except for IDPL, HAL, & ICI, all other industries of Balanagar discharge their effluents without treatment into the K-main which, due to insufficient capacity and poor maintenance had proved ineffective. The water samples from the nala had shown high concentration of pollutants through suspended and dissolved solids, pH, Chlorides, BOD, COD, sulphates, nitrates etc.

8. Rapid industrial growth of Balanagar was observed only in the last two decades. There is a rapid growth of the labour employed within Balanagar. But this could not generate a balanced growth of the area for residential, commercial, recreational uses etc.

9. The dense residential growth of Balanagar and lack of sufficient housing for its workers reflect the lack of future vision for the growth of Balanagar.

10. Air pollution and problem of odour is appreciably high in Balanagar which need control.

11. The heavy flow of regional and internal traffic during peak traffic period cause problems on the Bombay National Highway.

7.2 Recommendations For Industrial Fringe Development

In the focus of the issues identified in this study, it has been realised that great need for development control in fringe areas like Balanagar is required. In the absence of such measures these problems are likely to be more acute. The following measures are suggested to resolve the problems and envisage a proper future growth of any Urban Fringe area Industrial development.

GUIDELINES FOR INDUSTRIAL ACTIVITIES

1. The industrial development of an area must be based on a selective development of prospective industries. This depends on the matching of input and output requirements of the industries with the resource and demand characteristics of the area.
2. It is recommended to develop specific areas for the industries causing serious air, land and water pollution. The wind direction, the soil fertility, the type of water bodies and the places of historic importance present in the area are to be considered.
3. The equipment, apparatus and manufacturing processes are to be reviewed and new procedures for improvement by preparing comprehensive manuals is recommended to be initiated, supplied and implemented.

GUIDELINES FOR HOUSING ACTIVITY

1. The development of housing stock in the industrial fringes is recommended to be provided with financial and technical assistance by the government and other organisations like HUDCO.

2. Relationship between work and living area is needed. The residential, commercial and recreational activities are recommended to be developed in relation to workplace in order to save time and fuel.

GUIDELINES FOR ENVIRONMENTAL ISSUES

1. To keep the air pollution level low, creation of green buffer belts around industrial centres is recommended. Green buffer is also recommended between industrial area and residential area. This area can be used for parks, playfields, community centres etc., without disturbing its character. Electronic precipitators and other air filtering methods are recommended to be used by the individual industrial units to stop air pollution at the source.

2. The environmental protection measures are recommended to be framed based on the geographical situation of the area, in order to protect and conserve the areas of archeological, historic and scenic importance.

3. The process of collection, treatment and disposal of solid and liquid waste is recommended to be preplanned, without making any compromise on pollution control.

4. Combined facilities for the treatment and disposal of liquid and solid wastes of a group of small scale industries are recommended to be adopted which have the following advantages:

a) Economy---->Wastes from various units may help to neutralise each other. Lowering of construction, operation, and maintenance costs. Reduction in the variation of flow.

b) Viability---->These combined facilities present a convenient arrangement for both the management of indivdual industrial units and also the regulatory body.

c) Recovery and Reuse---->Bio-gas, heavy metals and various other by products can be recovered an treated effluent can be reused for cooling etc.

d) Co-operation---->Combined facilities are a positive step towards co-operation and leads to wider and more advantageous activities for the common good.

5. A modular design of the treatment plant is recommended to upgrade the method of treatment due to the possibility of variations in the quantum and ch aracteristics of the wastes.

GUIDELINES FOR COMMERCIAL ACTIVITY

1. It is recommended to restrict hawkers to the residential colonies. The local authority must apply strict control from allowing them into the market area.

GUIDELINES FOR TRAFFIC MANAGEMENT

1. The loading and unloading activity must be restricted within the industries, godowns and storage areas must be developed in the industrial areas. Parking of trucks and other vehicles must be restricted to notified parking lots that are recommended to be developed in industrial areas.

2. Fringe developments along Highways must not disrupt the free flow of fast regional traffic. The local traffic must join the highway traffic only at a few selected points. Providing seporate service roads for the local traffic or by-passing of highway traffic from the area are recommended.

MISCELLANEOUS

1. It is recommended to develop co-ordination between industrial planners, pollution control agencies, entreprenuers and public in order to overcome their different viewpoints and perceptions. This makes them aware of the compulsions and constraints of each other.

2. The urbanisation programme must aim at development of satellite towns in rural area. This would give relief to the metropolises and also alleviate poverty in rural areas. The optimum size of satellite town should be defined and a rational utilisation of less valuable land is necessary.

APPENDIX 1

FORCES OF AGGLOMERATION IN MANUFACTURING ACTIVITY

Industries have a tendency to cluster at a place due to a variety of advantages generated due to interdependencies of various units. These advantages are more defined and are in plenty in urban areas, thus, leading to the industrial agglomeration in and around the urban areas. Broadly, these forces can be explained as follows :

GRAVITATION TOWARDS LOCALISED RAW MATERIALS :

The availability of abundant raw materials which is bulky and would save a lot of weight in transportation, would save a lot of transportation cost if processed at the site of availability. This would economise the production cost thus, attracting the growth of such industries to the place of raw material availability. For ex., Steel plants.

GRAVITATION TOWARDS POPULATION CONCENTRATIONS :

The presence of population concentrations would offer abundant labour force at reasonably low pay. This would attract the establishment of labour intensive industries in the area.

ECONOMIES DUE TO INDUSTRIAL CONCENTRATIONS :

EXTERNAL ECONOMIES ---> These are most significant for starting of any industry and are due to the concentrations of a number of industrial units. They can be listed as follows :

* Presence of adequate Business outlet within the area.
* Growth of rich and active population nearby.
* Opening of railway and other means of communication.
* Availability of better facilities for repair and maintenance.
* Availability of skilled and specialised labour organisations.

* Developed market for the raw materials and finished products.
* Low risk factor against fire, accidents and safety.
* Lowering of social overhead cost.
* Availability of Entrepreneural talent.
* Availability of commercial, banking and financial facilities.
* Better business facilities like Accounting, Advertising, Business consultants, social, cultural and leisure facilities, Efficient public services, power, water, drainage and other facilities.

Apart from these economies the concentration of industries would also generate diseconomies due to

1) Creation of congestion due to heavy population.
2) Pollution of land, air, water, noise, dust, smoke etc., due to the industrial activity.
3) Increase in the land and rental values due to crowding.
4) A number of traffic problems due to through traffic, ribbon developments along traffic arteries etc.,

As these diseconomies, doesnot reduce the economic production of the industry, the agglomeration of industries continue to take place in urban areas.

INTERNAL ECONOMIES ---> These are the economies that are internal to industrial activity. They are of two types,

a) LARGE SCALE ECONOMIES : These are internal to the individual manufacturing units. Every unit has an optimum size of production for a given technical and factor costs in order to attain a minimum average cost of production. The large demand in metropolitan areas would allow in exploiting the full manufacturing capacity of the unit.

b) LOCALISATION ECONOMIES : These are external to the individual manufacturing unit but internal to the units of the same industry. These economies depend on :

* Resource location
* Ability to support and have access to R&D facilities
* Specialised brokers for the raw materials and finished products
* Development of skilled labour required for the industry
* Organised exchange of materials and products leading to the development as ancillary and associated units
* Specialised storage facilities allow for short notice purchases
* Favourable freight rates.

MISCELLANEOUS FACTORS :

1) The technological changes, reduce the dependency of the industry on various other facilities, materials etc., thus changing their locational priorities to other economies.

2) The location of a certain industry with respect to other industries depends on their cost-benefit relation and the mutual effect on one another.

3) The relocation of a unit would incur extra cost, to avoid which other related industries agglomerate near it.

Thus, it can be concluded that different industries are sensitive to quite different combination of various forces of agglomeration for their economic production, and is also dependent on the size of the unit. So, the location of a certain industrial unit would have a particular combination of these economies which depend on its line of production, size and various other requirements.

APPENDIX 2

CLASSIFICATION OF INDUSTRIES

The criteria for the classification of various industries are

1--Investment made in the Plant and Machinery for the unit.

2--The line of Production of the unit.

3--The Ownership of the unit.

4--Labour or market oriented industries

5--Consumer or producer oriented industry.

6--Dependency on other industrial units.

1--INVESTMENT IN PLANT AND MACHINERY

This was the criteria adopted by the Government of India. The industrial units are classified into four groups.

TINY INDUSTRIES :Maximum investment of Rs.10 lakhs

SMALL SCALE INDUSTRIES : The range of investment is from 10 to 60 lakh rupees.

MEDIUM SCALE INDUSTRIES : The range of investment is from 60lakhs to 10 crores of rupees.

LARGE SCALE INDUSTRIES : An investment of Rs.10 crores and above.

2--LINE OF PRODUCTION OF THE INDUSTRY

This classification is adopted by the Census of India and is as follows with code number,

20 Food and food products

21 Beverages

22 Tobacco products

23 to 27 Textile manufacturing

28 Wood and wooden products

29 Paper and paper products

30 Printing and Publishing

31 Leather products

32 Rubber, Petroleum and Coal products

33 Chemical manufacturing

34,35 Non-metallic mineral manufacturing

36 Basic metal manufacturing industry

37 Machinery and Electrical Equipment

38 Transport equipment

39 Miscellaneous Manufacturing.

3--THE OWNERSHIP OF THE UNIT :

PUBLIC SECTOR UNITS - The industrial units that are run by the government due to the importance of the industry in the economic development or some secrecy for the benefit of the community.

PUBLIC SECTOR UNDERTAKINGS - The units run as joint ventures of the Government with public dividends.

PRIVATE SECTOR - The units that are wholly owned by the private authority or person fall under this category.

4--LABOUR OR MARKET ORIENTED INDUSTRY

LABOUR INTENSIVE INDUSTRY- The industries falling under this category require a lot of labourers in the manufacturing process and so they establish at places of cheap and abundant labour force.

MARKET ORIENTED INDUSTRY- These units manufacture the products required in large quantities for the local area where they are present.

RAW MATERIAL ORIENTED- The industries that loose weight during the production process try to locate themselves near to the

source of raw material.

5--CONSUMER AND PRODUCER GOODS INDUSTRY

CONSUMER GOODS INDUSTRY - These industries produce the daily needs of the local people and hence establish themselves near to the any settlement.

PRODUCER GOODS INDUSTRY - Goods produced by these industry are export oriented or marketed at large distances. These establish at an area to take advantage of various other benefits.

6--ASSOCIATED AND ANCILLARY UNITS

The associated units are those which produce an item or product due to the joint effort of two or more industrial units. An ancillary unit is that which supplements a large industrial unit by producing small products and assisting it.

APPENDIX 3

SPACE STANDARDS FOR AMENITIES AT DIFFERENT LEVELS OF PLANNING UNITS IN A TOWNSHIP

(STANDARDS FOR RESIDENTIAL DEVELOPMENTS DEVELOPED BY THE CENTRAL BUILDING RESEARCH ORGANISATION AND THE TOWN AND COUNTRY PLANNING ORGANISATION)

1) CLUSTER LEVEL for 250 houses
Totlots and Nursery School.

ii) AT NEIGHBOURHOOD LEVEL for 1000 houses

Primary cum Nursery School	0.81 - 1.00 hectares
Parks and Playgrounds	0.65 - 1.28 hectares
Convenient Shopping	0.16 - 0.20 hectares
TOTAL	1.62 - 2.42 HECTARES

iii) AT SECTOR LEVEL for 3000 houses

Higher Secondary School-1	3.24 - 4.05 hectares
Health Centre-1	0.40 - 0.61 hectares
Shopping	0.40 - 0.61 hectares
Parks and Open Spaces	3.24 - 4.05 hectares
Miscellaneous	0.81 - 1.00 hectares
TOTAL	8.90 -11.32 HECTARES

iv) AT TOWN LEVEL

a) For towns upto 1000 houses

Higher Secondary School-1	2.02 - 2.42 hectares
Hospital-1	0.81 - 1.21 hectares
Open Space	2.02 - 2.42 hectares
Shopping	0.40 - 0.61 hectares
Community Centre	0.61 - 0.81 hectares
Miscellaneous	0.20 - 0.61 hectares
TOTAL	6.06 -20.00 HECTARES

b) For towns from 1000 to 3000 houses

Higher Secondary School-1	4.05 - 6.07 hectares
Hospital-1	2.02 - 2.42 hectares
Shopping	1.21 - 1.62 hectares
Open Space	3.24 - 4.05 hectares
Community Centre	1.62 - 2.02 hectares
TOTAL	12.14 -16.18 HECTARES

c) For towns from 3000 to 12000 houses

Education-1	4.05 - 6.07 hectares
Hospital-1	3.24 - 4.05 hectares
Shopping	3.24 - 4.05 hectares
Open spaces and Playgrounds	12.14 -16.19 hectares
Community centre	6.07 - 8.08 hectares
Miscellaneous	6.07 -10.12 hectares
TOTAL	34.81 -48.56 HECTARES

d) For towns above 12000 houses

Education-1	6.07 - 8.09 hectares
Hospital-1	8.09 -14.16 hectares
Shopping	14.16 -16.19 hectares
Recreational-1	101.17-121.41 hectares
Cultural	20.23 -24.28 hectares
Miscellaneous	30.35 -40.47 hectares
TOTAL	180.07-224.60 HECTARES

DENSITIES AT DIFFERENT LEVELS IN A TOWNSHIP
(Dwellings per hectare)

i) At CLUSTER LEVEL

2 storey	82-106
3 storey	106-131
4 storey	131-156

The areas for the purpose of calculating the cluster density would comprise of site covered by the buildings and incidental open spaces, tot-lots, access ways and path ways.

ii) At NEIGHBOURHOOD LEVEL

2 storey	54- 74
3 storey	69- 89
4 storey	89-109

The areas for the purpose of gross residential density at neighbourhood level would include all internal roads, amenities at the neighbourhood level plus half the area of peripheral roads.

LANDUSE PATTERN AT NEIGHBOURHOOD LEVEL

a) Net Residential area	65-70 %
b) Amenities	18-15 %
c) Circulation	17-15 %

DENSITIES AT SECTOR LEVEL

2 storey	44 - 64 hectares
3 storey	54 - 74 hectares
4 storey	69 - 89 hectares

The area for the purpose of gross residential density at sector level would include all internal roads, amenities at neighbourhood/sector level plus half the area of peripheral roads.

LANDUSE PATTERN AT SECTOR LEVEL

Residential area	55 -60 %
Amenities	25 -22 %
Roads	20 -18 %

DENSITIES AT TOWN LEVEL
(Dwellings per hectare)

Number of Storeys	Towns upto 3000 houses	Towns from 3000-12000 houses	Towns with more than 12000 houses
2	37 - 54	37 - 49	35 - 49
3	49 - 67	49 - 62	44 - 62
4	62 - 79	62 - 74	54 - 72
Range Recommended	37 - 62	37 - 62	35 - 62

Remarks : Township density is basedon the entire developed area of the township.

LANDUSE PATTERN AT TOWN LEVEL

Residential	50 - 55 %	45 - 50 %	40 - 45 %
Town amenities	30 - 27 %	33 - 30 %	40 - 30 %
Circulation	20 - 18 %	22 - 20 %	20 - 25 %

APPENDIX 4

ECONOMIC CRITERIA OF LAND

Economists are interested in determining the market price of a land while professionals in real estate and planning deal with the problems related to land allocation among various landuses. This market price of land is effected by various factors.

a) The urban demand of land depends on the soil type, topography, size, location, accessibility, legal and tax status etc.

b) The revenue yielding capacity of land decreases as per the distance from the market and this revenue also differs for different landuses.

c)The growth of activities in urban areas has influenced the nature of fringe areas which changed from being a predominantly agricultural use to an area of mixed use.

d) The industrial, residential, commercial, recreational, educational landuses etc., have more demand than agricultural use, thus resulting in high prices, intensive use and spill out of demand to fringe areas.

e) The urban fringe market is also dependent on the taxation depending on the use, like revenue tax, capital gains tax and property tax.

f) This market is also effected by speculation and sprawl.

There are two methods to estimate the fringe land values :

SEMI-DYNAMIC : The demand,supply, physical characteristics of land etc., interact to derive its land price.

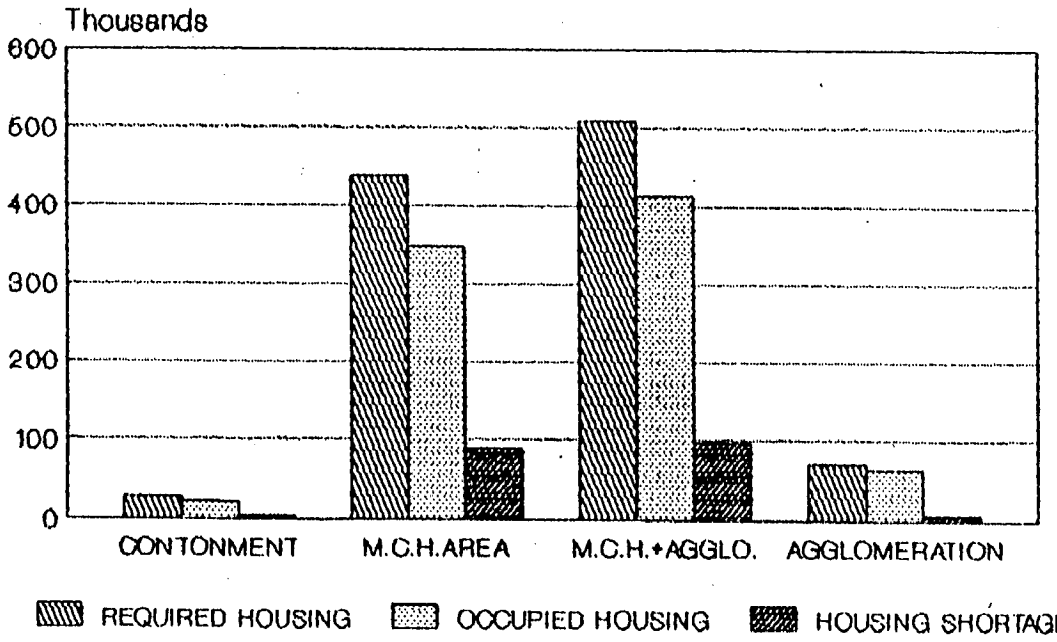
DYNAMIC : In this method, the expectations related to future variables like prices, urban growth, speculation and sprawl are accounted in order to derive the land price.

To avoid losses due to loss of production, misuse of land due to speculators, the government undertakes certain programs and policies through controls like zoning, price control, land ceiling, taxation etc.

Therefore, all the above factors have implications for the speed at which the agricultural land gets converted to urban use.

APPENDIX 5

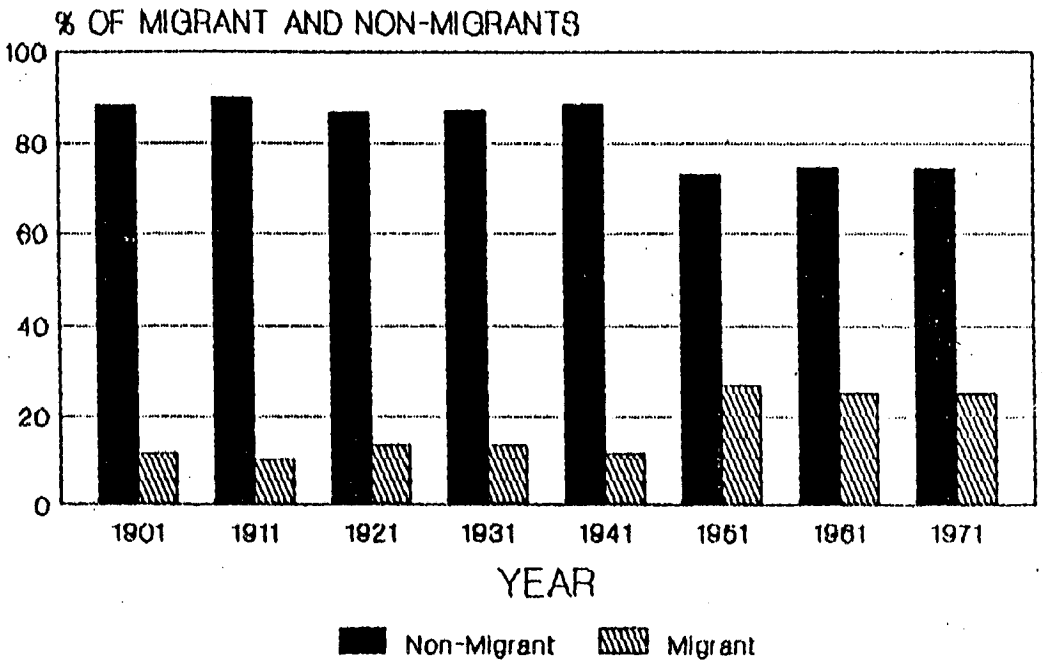
STATUS OF HOUSING SHORTAGE FOR HYDERABAD 1981



SOURCE:Census of India - 1981.

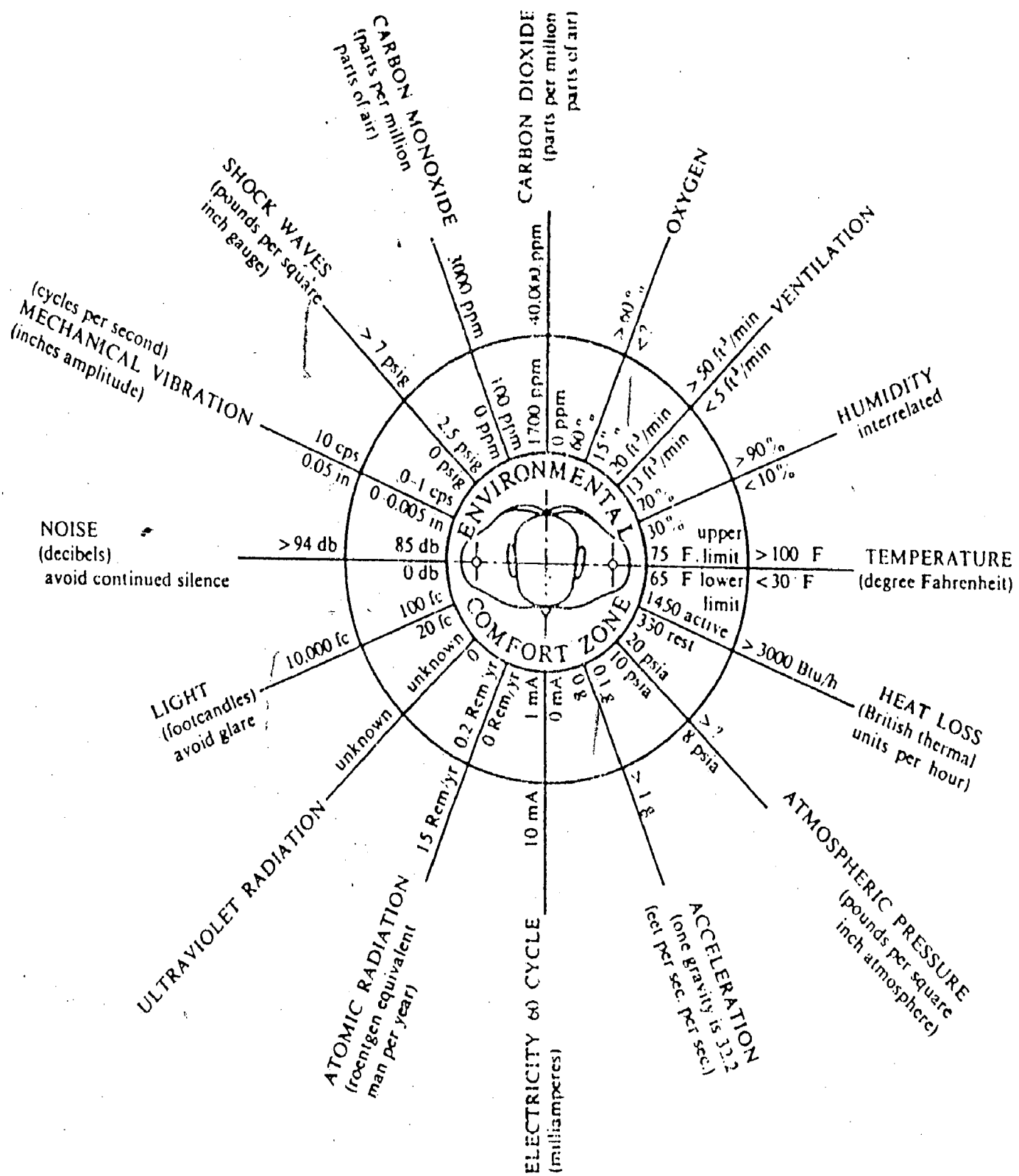
APPENDIX 6

MIGRANT AND NON-MIGRANT TRENDS OF HYDERABAD



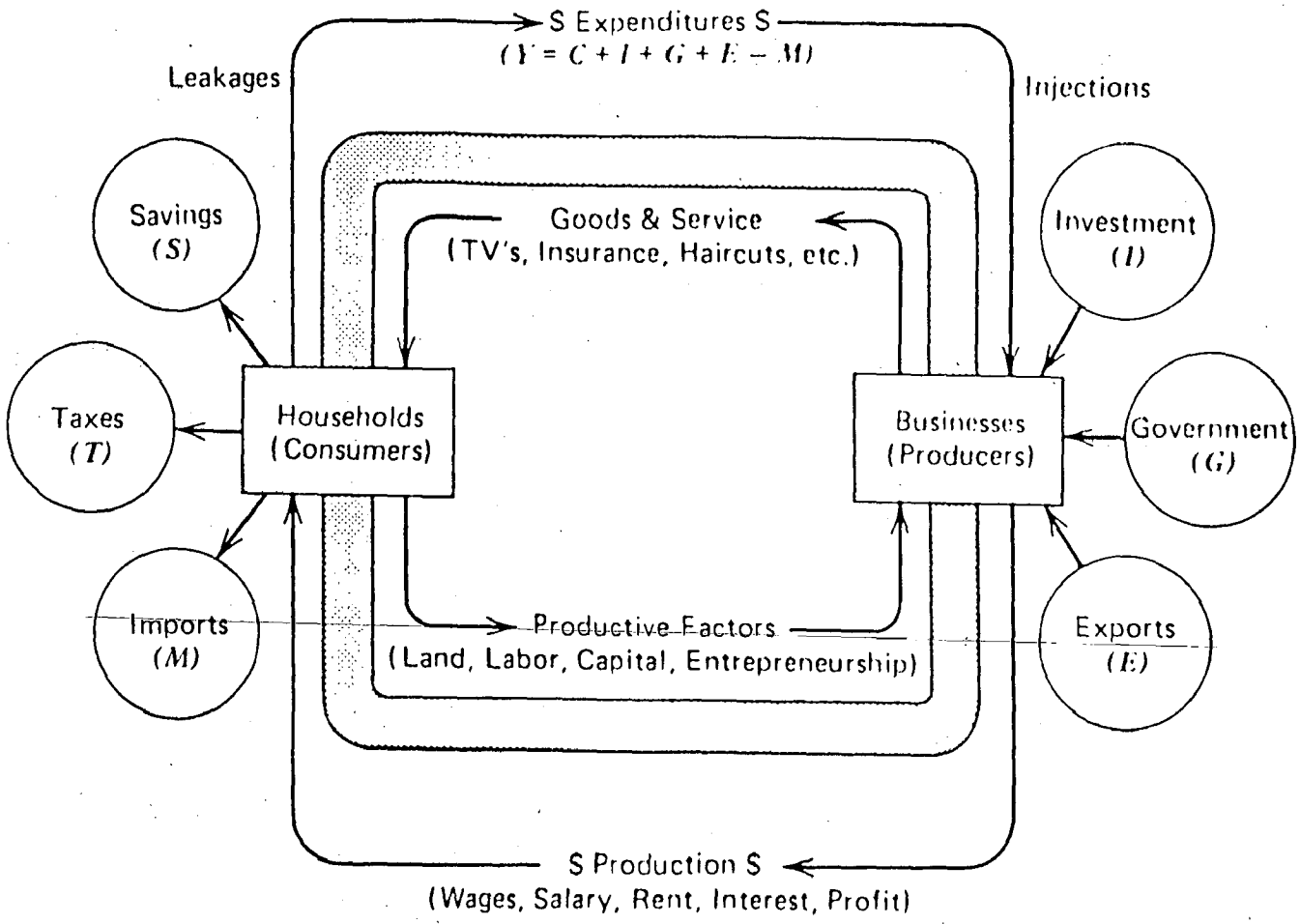
SOURCE: Census of India, Hyderabad.
Data in percentage

APPENDIX 7



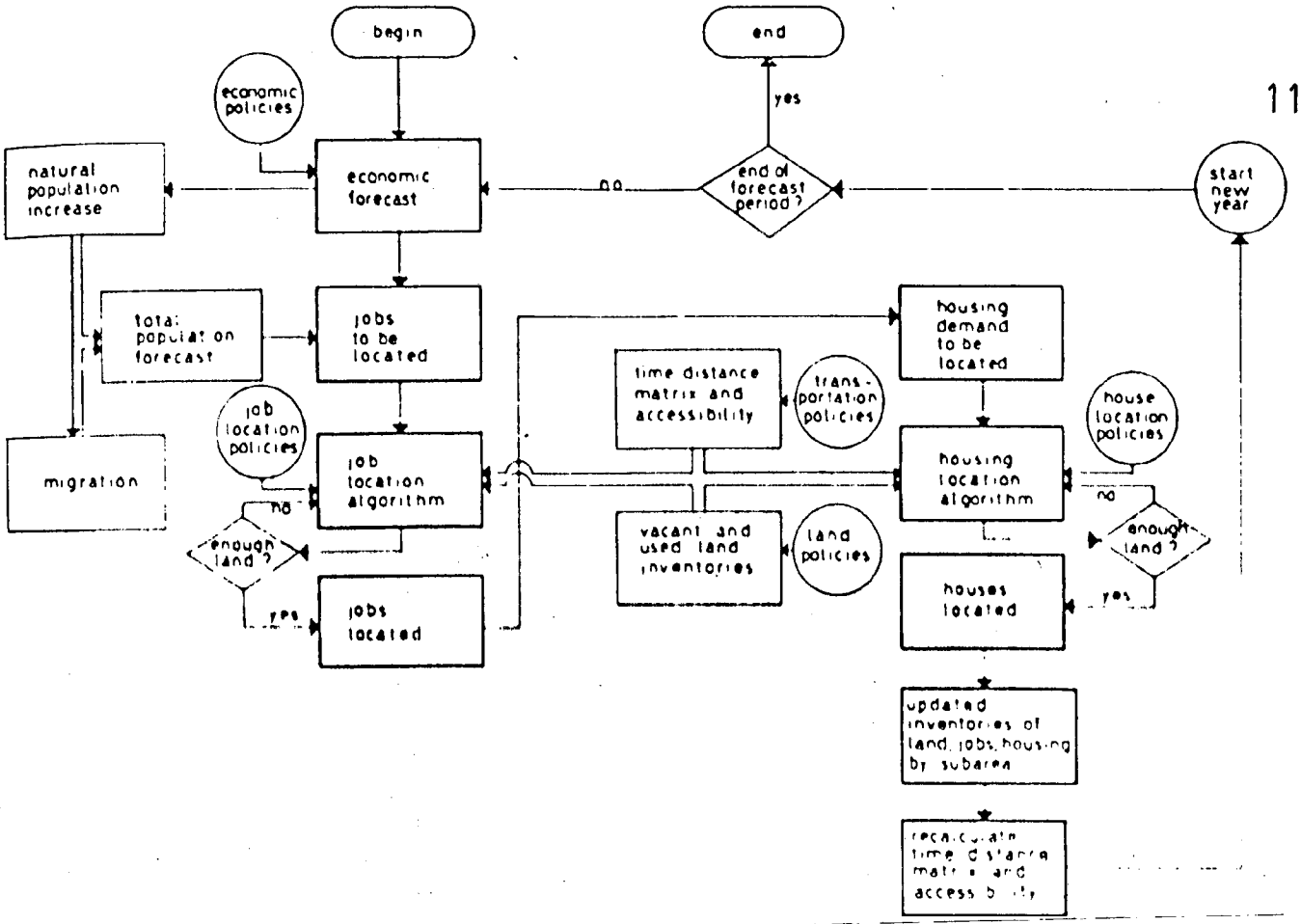
Environmental tolerance zones for the human body. The band between the circles indicates the zone from comfort to the tolerance limit. Outside this limit great discomfort or physiological harm is encountered. (*Source: Ref. 20-5, chart R.*)

APPENDIX 8



Circular-flow diagram of expenditure and production:

APPENDIX 10



Schematic flow chart of spatially disaggregated land use simulation model. [*Source:* Michael A. Goldberg, "Simulating Cities: Process, Product and Prognosis," *Journal of the American Institute of Planners*, Volume 43, No. 2, p. 152.]

APPENDIX 11

The different modes of urban planning

	Ameliorative problem solving	*Allocative trend modifying*	*Exploitative opportunity seeking*	*Normative goal-oriented*
Planning mode ▷	Planning for the present by reacting to past problems	Planning towards a predicted future	Planning with a predicted future	Planning by creating a desired future
Planning operations ▷	Analyse problems, design interventions, allocate resources accordingly	Determine and make the *best* of trends and allocate resources in accordance with desires to promote or alter them	Determine and make the most of trends and allocate resources to take advantage of what is to come	Decide on the future *desired* and allocate resources so that trends are changed or created accordingly. Desired future may be based on present, predicted or new values
Results of planning action ▷	Haphazard modification of the future by reducing the future burden and sequelae of present problems	Gently balance and modify the future by avoiding predictable problems and by achieving a 'balanced' progress to avoid creating new problems	Unbalance and modify the future by taking advantage of predictable happenings, avoiding some problems and exploiting others without a major concern for emergence of new problems	Extensive modification of the future by aiming for what 'could be'. New predictions by changing values or goals, matching outcomes to desires, or avoiding and changing problems to ones easier to handle or to tolerate

APPENDIX 12

TREES SUITABLE FOR BUFFER PLANTING

S.No.	Name of the tree	Height (feet)	Spread (feet)	Value as
1.	Mango (Seeding) (Mangifera Indica)	45 to 50	40 to 45	economic
2.	Jamun (Eugelina Jambolia)	40	35 to 40	—do-
3.	Neem (Azadirachta Indica)	45 to 50	45 to 50	—do
4.	Badh (Ficus Bengalensis)	40 to 50	50 to 70	flowering
5.	Shishum (Dalbergia Sissio)	46 to 50	30 to 40	timber
6.	Mahogany (Sweetenia-Mahogany)	50 to 60	45 to 50	—do—
7.	Tamarind (Tamarindus-Indica)	45 to 55	40 to 50	economic
8.	Inga Dulsis	35 to 50	30 to 40	flowering
9.	Silver oak (Gravilla Robusta)	35 to 40	15 to 20	—do—
10.	Ashok (Polyalthia longi-folia)	45 to 60	20 to 30	timber
11.	Peltophoram Ferrygineum	35 to 40	30 to 35	flowering

Flowering trees can be planted in 3rd or 4th row to break the only green foliage effect.

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