ANALYSIS OF INDUSTRIAL GROWTH AND URBAN STRUCTURE WITH EMPHASIS ON CAUSE-EFFECT RELATIONSHIPS. CASE STUDY : KOTA

A DISSERTATION

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

By

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CANDIDATE'S DECLARATION

I hereby declare that the work which is being presented in the dissertation entitled, **"ANALYSIS OF INDUSTRIAL GROWTH AND URBAN STRUCTURE WITH EMPHASIS ON CAUSE - EFFECT RELATIONSHIPS. CASE STUDY : KOTA"**, in partial fulfilment of the requirements for the award of the degree of **Master of Urban and Rural Planning,** submitted in the Department of Architecture & Planning, University of Roorkee, Roorkee, is an authentic record of my own work carried out from July 1995 to February 1996, under the guidance of **Prof. N.K. Tayal**, Professor, Department of Architecture & Planning, University of Roorkee, Roorkee (India).

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

DATE : 23rd Feb' 1996 **(PIYUSH KUMAR GOYAL)**

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

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Roorkee

Dated : 25rd Feb, 1996

(PIYUSH KUMAR GOYAL)

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Chapter - 1

INTRODUCTION

1.1 BACKGROUND

National census reports during the 1960's showed that very large population shifts were occurring from rural to urban areas in most of the developing countries due to rapid industrialization. India too, has been experiencing rapid urbanisation indicating its vibrant non-agricultural sector's progress. The study of the growth of towns reveals that some towns have attracted industries and have grown with them. In some cases, industries have given birth to entirely new towns. Both types of towns are prosperous and provide better employment opportunities and, in turn, attract a vast amount of the supporting population. Therefore, urbanisation has long been associated with industrialisation, indeed they have been considered synonymous.

The 'town forming' process involves various factors e.g. industrial, administrative, cultural, availability of specialised facilities (e.g. education, medical, commercial, transportational) and statistical data of the population. Further, the interdependence of the above factors and size and structure of town is much more significant for development of town. Every town has a typical structure. This structure varies from one town to another, as it depends to a large extent on the geographic location, setting historic growth and demographic and occupational characteristics of that town. Here it would be better to define 'Urban structure' in words of 'W.H.Hirach'

"Urban structure refers to the spatial organisation of key functional areas and essential service facilities of the city in response to certain fundamental living needs and activities of human society".

Urban structure can broadly be divided under the following sub-heads:-

1. Socio-cultural structure
2. Physical structure
3. Economic structure

The socio-cultural elements cover the various demographic characteristics and major socio-cultural activities. The physical structure is a spatial manifestations of economic and socio-cultural characteristics of a town. It is affected largely by various land uses and there disposition in relation to other land uses. The economic structure of the town directly affects the overall structure of the town. It is reflected by the occupational structure of the people and consequently by the physical structure of the town which keeps on changing over a period of time.

Hence, when a function or an activity (e.g. industrialization) in the town is open to growth or change, this town also grows and changes, this will influence another activity (e.g. occupational structure, socio-cultural status of people etc.) and the other activities (e.g. residential, transport network, amenities and facilities etc.) and forces (e.g. commerce and trade) that to adjust and coordinate themselves to this growth. New connections arise and old are broken down. As a result, town changes its structure in a never ending system.

Industrial growth changes urban structure and pattern of city by vast concentration of people and over changing social, cultural and economic activities of community.

This thesis project involves a study of the changing urban structure along the growth of industrialisation. It includes analysis of dynamic characteristic of urban structure. Based on this study desirability or undesirability of the continuation of the present trends in urban spatial distribution are analysed. Therefore, it was needed to establish "cause and effect relationship " between urban structure and industrial growth. This exercise will culminate into finding out of a desirable trend of change of urban spatial structure and hence to derive a planning strategy.

Kota is taken as study area for this thesis. The urbanisation and industrialisation in Kota took impetus after 1960 A.D. Master Plan for Kota was prepared in 1971 for a projected period of 20 years (1971 to 1991 A.D.). Now this master plan has been made workable till 2001 A.D. by alloting more land for the development of the city. The industrial growth rate being rapid made Kota to be known as 'Industrial Capital of Rajasthan'.

1.2 OBJECTIVES

The objectives of this study are as follows:

1. To identify the forces behind industrialisation.
2. To analyse the impact of industrial growth on various aspects of urban structure.
3. To identify areas of compatibility and conflicts between growth of urban structure and industrialisation.
4. To identify inadequacy of infrastructure at present.
5. To make the projections for needs and requirements for future.
6. Finally, to suggest a planning strategy.

1.3 SCOPE

The study is to assess the present policy of industrial growth and physical planning practices so as to recognize areas of compatibility and conflicts and to arrive at a definite conclusion. And hence to give recommendations to relate the facet of urbanisation for development of the city. The study will help in visualization of the urban scenario in future and evolution of a desirable urban structure.

1.4 METHODOLOGY

1. Identification of problem from secondary sources as well as from visual surveys.

2. Literature survey - This includes the conceptual study of the factors and forces which operate in industrial cities and affect the urban settlement pattern. Further, a similar case study is also dealt with.
3. Pre-industrialisation land use and change in urban structure due to industrialization with emphasis on appraisal of Master Plan for Kota.
4. To understand upto what extent such factors and forces are operative.
5. Study the major concentration of industrial labour living in residential areas of the city.
6. Derivation of a planning strategy for achieving a more balanced pattern/structure of urbanisation.

Chapter - 2

LITERATURE SURVEY

2.1 CONCEPTUAL STUDIES

2.1.1 Trends in Urbanisation and its Impact on Urban Settlement Structure, India [12]

Urban settlements, as exercising industrialisation, are found to be of nine types.

1. temporary (rehabilitation, squatting, project related etc.)
2. slums
3. scattered
4. with defined boundaries
5. sprawling
6. with single nucleus
7. with multi nuclei
8. linear
9. combination of any two or more types

The issue is, how these should be integrated and planned. It is desirable to have balanced urbanisation spatially i.e., the urbanisation rate in the states/region with the high level of urbanisation is slowed and in other areas it is promoted.

2.1.2 Guttenberg's Theory on Urban Structure and Urban Growth [11]

Guttenberg's theory on Urban Structure and Urban Growth is directed towards accessibility concept as a part of the physical organisation of space and flow systems within the city space. Guttenberg also views human interaction as basic determinant of urban spatial structure. But he points out that in this process for achieving an interaction, community organizes itself so as to minimize the distance of interaction or what he calls "community effort to overcome distance". There are only two means

available to do so. Either people can be transported to facilitates or facilities can be distributed to people.

An interesting conclusion that Guttenberg makes is that "transportation systems hold the key to the way in which growth proceeds" and that "if transportation is poor, the work places, trade centres and community services will tend to assume a pattern of distributed facilities, if it is good, these activities will assume more concentrated patterns in the form of undistributed facilities". In this sense distributed facilities and transportation systems become the basis for the organisation of human activities.

2.1.3 Urban Structure and the Composition of City Centres [7]

A town consists of spread and centralized activities, this is too narrow a view, as all towns are more or less dynamic, and not static.

1. The town is a physical thing (houses, streets, squares, etc.) the town in a static sense.
2. The town represents several human and economic activities (manufacturing, purchasing, living and recreation): the town in a dynamic sense.

The dynamic elements develop and change from within. They use the physical, static-things in the town which provides the setting for these activities. In other words, the dynamic activities fill out the static dead form (buildings) and give life to the whole town.

When the activities in the town develop, the physical static things must be adjusted to the activities which occur so quickly that the physical static town hardly has time to adapt itself to the changes. The dynamic activities therefore, must force themselves into a static, established structure. Hence, instead of static physical town adjusting itself to the activities, the activities must try and adjust themselves to the physical town, and make the best they can out of it.

2.1.4 Development of a Model of Urban Spatial Structure [8]

(By David Crowther and Marcial Echnique)

Foley (1964) defined urban spatial structure as the outcome of two interdependent processes by which first, artifacts and, second activities are allocated to specific sites. The first locates the physical infrastructure (i.e. the stock of buildings etc.) in response to the aggregate demand for a space made by all activities while the second locates the activities within this physical stock according to their functional relationships with each other. The overall process can be seen as symbiotic, with activities creating a demand for a stock, which once built, constrains their location.

In general, activities are of two kinds: 'within place' and 'between place'. The first relates to localised activities e.g. industrial, commercial, recreation and residential - the second flows of all types that occur between 'within place' activities e.gg of information, money, people or goods. 'Between place' activities, or flows, can be seen as an expression of the functional relationships between 'within place' activities. 'Within place' activities can be further disaggregated to employment types, household types (subdivided into categories of socio-economic group, age and family structure) and service type (subdivided into categories of shopping different hierarchical levels, schools, recreation etc.). 'Between place' activities can be disaggregated into transportation modes (private vehicles, trade vehicles etc..) information flows (telephone, post etc.,) and public utilities (water, gas, sewage etc.,).

The two corresponding kinds of physical structure which accommodate these activities are 'adapted spaces' and 'channel spaces'. Adapted spaces refer to the buildings and land which contain 'within place' activities, while Channel spaces refer to the transportation and communication networks which contain 'between place' activities.

2.1.5 Melvin M. Webber [6]

Webber emphasizes the importance of viewing the city as a dynamic system in action. The dynamic feature is traced through linkage which he defines as dependency ties relating individuals firms and other entities to one another.

Under his scheme, he measured spatial linkages i.e. the flow of information, money, people, goods and studied the channels used and space forms adopted for human interaction and examined the location of activities. These observations would be classified as follows :

Dimension	Interaction Component	Physical Component	Activity Component
1. Size of phenomenon	Amplitude	Capacity	Volume
2. Degree to which phenomenon piles up in major concentric forms around a point	Facilities	Nucleation	Centralisation
3. Propensity of phenomenon to pile up at a point of lesser con centration	Sub-facility	Sub-Nucleation	Sub Centralisation
4. Degree of pile up per unit (e.g. pile up per 100 contacts between people per sq.mile area etc.)	Intensity	Density	Centralisation
5. Relative togetherness of like phenomena	Affinity	Clustering	Localisation
6 Relative degree of mixture	Insulatiry	Separation	Segregation

2.1.6 Myrdal's principle of circular and cumulative causation [10]

It is commonly known as that there are close relations between urban growth and changes in the structure of urban activities. Industrial activities

primarily serve local market and have an initial multiplier effect. New local demands are created both by the industries themselves and by the purchasing power of their labour forces. This calls into being a host of new business, service, trade, construction, transportation, professional practices etc. The combined effect of new industrial employment and an initial multiplier effect will be an increase in population or growth in urban size. These higher thresholds will attract additional new manufacturing functions. Plant construction in response to these thresholds again generates a multiplier effect and higher thresholds, and the process continues in a 'circular and cumulative' manner until interrupted or impeded.

This multiplication of interactions among the growing number of individuals engaged enhances the possibilities of technological improvements, and inventions, enlarges the likelihood of the adoption of more efficient managerial and financial institutions, increases the speed with which locally originating ideas are disseminated, and eases the diffusion of skills and knowledge brought in by migrants from other areas. That is, once new industries have been erected or old ones enlarged, it results in employment and population increase. the web of interpersonal communications is again extended and thickened, the chances for invention and innovation are further enhanced, and the circular process continues, perhaps even at an accelerated pace, until diverted or hindered.

2.1.7 Concept of Industrial Estates [9]

(A) PHYSICAL PLANNING FOR INDUSTRIAL ESTATES

Industrial development policies have used the Industrial Estates to accelerate industrialisation and generate employment opportunities and to relieve hardships in depressed areas by expanding and diversifying the industrial base. The Industrial Estate has been utilised to guide the locations and development of industry.

In India, where Industrial Estates have been a major feature of the industrialisation programme for small scale industry, the physical and social relationship of Industrial Estate with the town or city in its proximity was given little attentions in the early period of development.It is only since the 'Third Five Year Plan' that location and development of Industrial Estate s was viewed as an integral part of the total city's development plan and development within and around the estates gets regulated by the land use control and zoning regulations embodied in the development plan. Industrial estates also trigger spontaneous and unplanned growth around them due to convergence of the servicing industries, workshops, ware housing and storage facility and personal service establishments. The planner attempts to create socially cohesive urban communities by applying the neighbourhood concept through measures which enhance local face to face contact, facilities, local loyalities and attachments, offset detachments caused by residential and social mobility, stimulate personal feeling of identity, security and stability and offer opportunities for training the young in their future roles.

(B) INDUSTRIAL ESTATES VS INDUSTRIAL AREAS

Industrial estates and industrial areas are bit confusing, as in practice, they are used interchangeably. But of both of them differ as described below:

1. Industrial Area is a developed land for industrial purpose with infrastructure facilities with internal roads, streets, light and power and other utilities. No factory sheds/buildings provided by the government whereas Industrial Estates are a planned cluster of industrial buildings with the sound network of utilities and facilities like water, transport, electricity, steam, post office, banks, watch and ward etc. Specialised services like raw material depots show room and common facility centres are also provided in an Industrial Estates.

2. In Industrial Estates, there is a comprehensive network of policies on admission, additions or modifications in buildings and terms and conditions, whereas in Industrial Areas the government keeps a general overall control regarding such matters.

As the problem and prospects are almost of similar magnitude in Industrial Areas and Estates, they have been therefore used in an interchangeable term and function simultaneously.

(C) LOCATIONAL ASPECTS OF INDUSTRIAL ESTATES

Locational aspects are the crux of success of an Industrial Estate . Various factors such as water, power, availability of labour, nearness to big cities, easy availability of land on reasonable rates, good demand for the surrounding area for products, access to the railway and highway, expansion, potentiality and suitable communication system etc. All the above factors are sincerely followed while selecting the site for the Industrial Estates .

2.2 NEW INDUSTRIAL POLICY 1991, INDIA

On 24th July 1991, the congress govt. at centre announced an industrial policy, the main features of the new policy are :-

1. Industrial licensing policy abolished for all projects except for a short list industries of security and strategic importance.
2. Direct foreign investment raised from 40 to 51 percent equity in such industries.
3. Automatic permission for foreign technology agreements in high priority industries.
4. Dis-investment of government holding in public sector to raise resources.

5. M.R.T.P. threshold of assets limits to go, emphasis will be on controlling and regulating monopolistic, restrictive and unfair trade practice.
6. In locations other than cities of more than one million population, there will be no requirement of industrial approvals from the central govt. except for industries subject to compulsory licensing.
7. No permission will be necessary for hiring of foreign technicians, foreign testing of indigenously developed technologies.

2.3 INDUSTRIAL POLICY OF RAJASTHAN , 1990 [19]

2.3.1 Objectives

An industrial policy for the state of Rajasthan was last announced in 1978 . The experiences of the changes that have taken place during the last decade and the governments commitment to speedy industrial development have necessitated that a new Industrial policy should be framed. The Government of Rajasthan announced the industrial policy 1990', the objectives of this policy are as under-

1. Optimum utilization of available mineral, argicultural and other resources of the state so as to increase the contribution of industrial section is the state domestic product.
2. Creation of additional employment opportunities.
3. Elimination of regional imbalances
4. Encouragement of entrepreneurship.
5. Augmentation of the state financial resources through industrialisation in order to enable the state to take up more development programmes.

2.3.2 Priorities of Industrial Development

Order of priorities for the development of different industries will be as under:

1. Khadi and Village industries Handloom, Handicrafts, leather industry.
2. Tiny industries
3. Small scale industries and ancillary industries
4. medium of large scale industries

2.4 STRATEGY ADOPTED FOR INDUSTRIAL DEVELOPMENT IN THE DISTRICT [20]

In order to establish industrial units in the district to properly utilize the existing resources, infrastructure facilities and incentives to their optimum extent, District Industry Centre (DIC) has adopted a strategy, which has following salient feature:

1. Definitions of Industries

(a) Tiny Industry :- Which has investment on machinery upto 5 lakh.

(b) Small scale & Ancillary industries :- Small scale and ancillary industry have investment limits on machinery as 60 lakh & 75 lakh respectively.

(c) Medium scale and large scale Industries:- Investment on machinery upto 5 crore and above 5 crores in medium and large scale industries respectively.

2. Guidance & Technological Advice

DIC provides technical knowhow to entrepreneurs and guide them in choosing right type of industries. It publicizes the incentives and arrange training & seminar camps to encourage entrepreneurs.

3. Incentives

Temporary/permanant registration of SSI nos. is necessary for getting the aids given by the state/central govt. These industrial units can get scared raw minerals,

imported machinery, raw materials, financial aids, land or shed allotment in industrial areas, electricity, water supply, quality marking, machinery on rent basis, loan from finance corporation, Telephone priority and so many other aids. When the units starts its production then it is given permanant SSI nos.

4. Different Aids for Industries

(A) STATE CASH HELP SCHEME

The units registered during 1-04-90 to 31-03-95 will be provided financial aid. This aid will be 20% (to small scale) and 15% (to medium/large scale) of their total investment and maximum upto Rs.15 lakh.

(B) SUBSIDY ON TESTING

A subsidy upto 50% or Rs. 20,000/-, whichever is less, is provided on the expenditures made on testing equipments to test the finished product of units.

SSIs are provided a subsidy on diesel generator set upto 25% or rs. 50,000/- whichever is less.

(C) SUBSIDY ON ALLOTMENT OF PLOTS

(i) S.C & S.T. industrialists are alloted plots on 50% rate.

(ii) Women industrialists are provided 10% rebate.

(D) EXEMPTION FROM 'OCTORI'

For new units, for first five years, there is a provision of exemption from octroi for incoming raw materials and machinery.

(E) LOAN FACILITIES

By Rajasthan Finance Corporation (RFC)

RFC provides loans for development of new and old industries maximum upto 90 lakh. Technicians are provided loans upto 2.5 lakh without margin money only against the guarantee of property.

By Khadi Gramoudyog Board (K.G.B.)

K.G.B. provides loans for a duration of 5 years to the individuals and Sahakari samities, who are engaged in traditional Handicraft, at the rate of interest of 4.5%.

By Banks

* Term Loan - as per the directives of RBI at the rate of interest of 13.5% to 17.5%
* 75% loan against pledge
* Letter of credit (L.C.)- Guarantee in the form of L.C. is provided to the exporters.

(F) ISSUE OF CERTIFICATES

'Essential Certificate' is issued to facilitate the import of machines and equipments from abroad.

(G) B.I.G.

A separate cell is established named as 'Bureau for Industrial Guidance' to provide technical knowhow and guidance to entrepreneurs.

(H) SALE TAX ENCOURAGEMENT /DEFFERMENT SCHEME

A rebate in sale tax for 7 to 11 years on the total established investment is given. If applied within 180 days of start of production.

(I) INTEREST FREE LOAN SCHEME

Interest free loan to the units, set up after 1-4-90, is provided upto 100% of the total capital investment. This loan is issued on the basis of sale tax paid and is to be refundable in 5 years in 5 equal installments.

(J) PRIME MINISTER EMPLOYMENT SCHEME

A loan upto maximum Rs. 1 lakh can be issued to the youth having qualification atleast I.T.I. or matriculation. 15% of the loan will be the aid which has maximum limit of Rs.7500/-.

2.5 CONCESSIONS / FACILITIES TO INDUSTRIAL SECTOR PROVIDED BY R.S.E.B [18]

1. LARGE INDUSTRIAL CONSUMERS are required to pay only 50% minimum charges in first year .
2. MEDIUM AND SMALL INDUSTRIAL CONSUMERS are required to pay no minimum charges in the first year and only 75% minimum charges in the second year.
3. Cost of service line deposited by large industrial consumers is refunded through adjustment in monthly energy bills.
4. Cost of H.T./ L.T. extensions is not recovered from new small and medium industrial consumers in RIICO Industrial Area.
5. S.C./S.T entrepreneurs are given overriding priorities in releasing service connections.
6. No power cut for consumers upto 3000 KVA contract demand.
7. MEDIUM AND SMALL INDUSTRIAL CONSUMERS are provided with subsidy of Rs. 2000/- and Rs. 1000/- per pole respectively in estimate of their service line.

8. Now seasonal consumers can operate for eight months in a year, nonseasonal consumption permitted upto 25%.
9. Temporary connections can be released upto three years by the Assistant Engineer.
10. Running sick industrial units are required to pay only 50% of minimum charges.
11. All bonafide domestic consumption in industrial colony/quarter/hostels are billed under domestic tariff.
12. Benefit of new industries are allowed to revive sick industries also if the product altogether changes.

2.6 SIMILAR CASE STUDY - JETPUR [21]

Introduction

Jetpur is class II town as well as Taluka H.Q. of Rajkot district in Saurashtra region of Gujarat state. The total area of Jetpur Taluka is 67897.0 hectares.

2.6.1 Geo-climatic Characteristics

Jetpur town is located on west bank of river Bhadar, the biggest river in saurashtra region. It is located at $21^{o}51'$ north latitude and $70^{o}51'$ on east longitude and 91.44 metres above the Mean Sea Level. It is on the south west of Gujarat state. The slope of the region ranges between 0 to 1% towards west. This area has a moderate climate having :

Avg. temperature in summer = $35^{o}C$

Avg. temperature in winter = $13^{o}C$

Avg. Annual rainfall = 64 cm.

2.6.2 Demographic Characteristics

Jetpur city has increasing growth rate in specifically last three decades. Details of population since 1901 are given in the table below:-

YEAR	POPULATION	GROWTH RATE PERCENTAGE
1901	15919	-
1911	16513	3.73
1921	18694	13.21
1931	22973	22.89
1941	28406	3.65
1951	28444	0.13
1961	31186	9.64
1971	41943	34.49
1981	63704	50.38
1991	89185	42.00

Further, sex ratio in the town is 942 females per 1000 males while literacy rate is about 60%.

The following table shows the worker's distribution as per 1981 census.

INDICATORS	NOS.	PERCENTAGE
Population	63074	100
Non workers	45595	[72.29]
Marginal workers	55	[0.09]
Main workers	17424	[27.62]
Cultivators	1093	(6.27)
Agri. Labour	246	(1.41)
Household industry	231	(1.33)
Other workers	15854	(90.99)

[ ] shows the percentage of total population

( ) shows the percentage of total main workers

Hence very less participation in Agriculture (1.41%) and a very high percentage of other workers [90.99%] which include about 40% workers engaged is industries other than household industries. These statistics make Jetpur an industrial town.

2.6.3 Criteria of Selecting Jetpur as Similar Case Study

Following are the reasons behind selecting Jetpur as similar case study

1. Jetpur similar to kota is situated on the bank of a perennial river.

2. N.H. no.8B (Connecting Porbandar and Ahmedabad) passes near by Jetpur as N.H. no. 12 (Connecting Jaipur and Jabalpur) passes through Kota.

Besides Industries these two are the major factors which affect the growth of urban structure in both the town i.e., Jetpur & Kota. These two factors being similar, fulfil my objective of analysing the growth of urban structure in light of industrialization. This makes Jetpur suitable to be taken as similar case study.

Further, a comparable study had been done by M.I.Umar titled as "Impact of Industrial growth on Urban development, (Case study Jetpur)" (M.U.R.P. 2nd yr, Thesis Project, Deptt. of Arch & Plng, U.O.R., Roorkee) in 1993. This thesis report helped me in guiding my line of action.

2.6.4 Review of M.U.R.P. Thesis "Impact of Industrial Growth on Urban Development (Case Study -Jetpur)" by M.I.Umar

The study had an aim to give a set of recommendation for future growth and some proposals for modifications in Master Plan for Jetpur. The objectives of the study mainly include.

1. Study of industrial growth in town and its impact on urban development.
2. Identifying the problems and framing a policy for future development, and
3. Proposals and modifications in Jetpur Master Plan for balanced growth.

To achieve these objectives the methodology adopted involves study of causes of industrialisation in the town, literature survey, data collection from secondary sources and visual surveys, framing of policy and set of recommendations based on data collection and problems identified and finally to make proposals for future development.

Study of Jetpur town and industrial growth in it was studied in terms of, Geo-climatic characteristics, historical evolution, demographic characteristics, economic structure of the town (i.e., industries, trade & commerce), occupational structure, land use and infrastructure and amenities, nature of industries, chronological growth, area under industries etc. Further, the analysis work included the impact of industrial growth on occupational pattern, residential & commercial development transportation, land uses etc.

Finally the problems were identified under the following heads :

1. Poor enforcement of legal frame-work.
2. Failure in controlling the haphazard development of land.
3. Non-restoration of powers by municipality for the enforcement of the law.
4. Development of industrial areas outside the municipal limit.
5. Lack of town planning staff in municipality to implement the plan.

Based on these problems and keeping the legal tools and legal constraints together in mind some proposals and set of recommendations are derived. Further, some modification in master plan for Jetpur are also recommended

2.6.5 Discussion on the Policy Adopted for Proposals & Recommendation

For deriving out proposals & recommendation the policy adopted by M.I.Umar includes following points:-

1. Proper locations of industries presently & in future as well.
2. Development of efficient transport network.
3. Improvement of slum areas.
4. Improvement of existing drainage system.
5. Checking the pollution.
6. Properly placed recreational areas at suitable situations.

The thesis is based on the 1981 census data and all the projection are made in accordance with it. Further, the industries in the town are not resource based, hence, participation rate was assumed to be constant(i.e. 28%) for the consecutive two decades i.e., 1981 to 1991 and 1991 to 2001. Moreover, on analyzing the concluding part of the thesis, following points come out which require analysis in case of Kota town.

1. Jetpur is a small town having population around 89,000 with a growth rate 42% (during 1981 & 1991) while Kota is a large town with a population around 5,37,000 with a growth rate of 50% during last census decade.
2. Jetpur, being a small town, is located on a metre gauge railway line while Kota is main junction on Delhi-Bombay main broad gauge railway line. This obviously being a major factor which affects the activities in and of the town to a great extent.
3. In Jetpur, the industries are scattered throughout the town while in case of Kota the concept of industrial area and Industrial Estates has been predominating.
4. The industrial base of the Jetpur town is small scale industries dominated by sari-printing industries (about 95%) while in Kota the industrial base is diversified in a wide range.
5. The industries in Kota are mainly manufacturing industries, Which are supposed to pose a severe impact on occupational structure so far and in future as well.
6. Availability of cultivable land and good canal irrigation facilities also effect the occupational structure of Kota which is absent in case of Jetpur.
7. Abundant power generation in the region also make Kota suitable for heavy industries which is an important factor in the development of industries in the town.

Such a discussion enables me to select correct line of action and deriving out some workable conclusions.

Chapter - 3

PROFILE OF THE CITY

3.1 GEO -CLIMATIC PROFILE

3.1.1 Location

Kota is one of the most important city situated in the South eastern region of Rajasthan,lying at the intersection of $25^0 11'$ North latitude and $75^0 51'$ East longitude on the right bank of river Chambal or Charmanyawati at an altitude of 253.3 m above the Mean Sea Level. It is a district town.It is about 470 Kms. from Delhi and 920 Kms. From Bombay. National Highway no.12 (connecting Jaipur and Jabalpur) passes through Kota.

Since it is located on Delhi-Bombay main railway line and lies on NH No. 12,therefore, it is having good transport and communication connections.It's better infrastructure facilities have given the city an opportunity to develop as an industrial centre. Further, It had an edge over the state capital Jaipur because Jaipur did not have broad gauge railway line connections before the year 1990 A.D. It is the district Headquarter and hence has headquarters of commissioner,banking administration, Chambal command area and divisional headquarter of the Western Railway and other governmental department, Education centres located within itself.

3.1.2 Physical Setting

Kota city is situated on the right bank of river Chambal, it lies North of Darahi range. Since 1971 most of the part of the city developed has been possible due to the land being rocky and barren as it is extension of Malva Plateau in Rajasthan. There is a clear demarcation of plain agricultural land on the Northern side of main canal and on the other hand in the South is rocky and barren and high levelled with an ascending gradient towards South.

Construction of Kota barrage on river Chambal just at the point where it touches the city was completed in 1960 A.D. This Barrage has added beauty and dignity to the Kota city. General slope of the city is towards North and city area close to river drain towards the river and other areas drains in the near by tanks, nallahs and the other rivulets.The slope from extreme South to the main canal , being a part of Malva Plateau rocks is steep with an elevation difference of around 160 ft., while rest of the area slopes towards North from the canal having elevation difference of around 20ft.within almost equal distances.Landscape around the city is interesting and possess many picnic spots.

(A) CONFIGURATION:

The mean elevation of the city is 253.3 m above m.s.l. There is a clear demarcation of plain agricultural land and barren land, on the Northern side of right main canal, the land is good fertile agricultural land. Generally the city slopes northwards from the high table land of the Malva and has natural (storm water) drainage through Chambal and it's tributaries Banas, Kalisindh and Parvati. The Mukandan range hills (1400 to 1800 ft.) above (m.s.l.) running across the Southern portion from North West to South East is an important feature in the landscape on the South West of Kota .

(B) RIVERS :

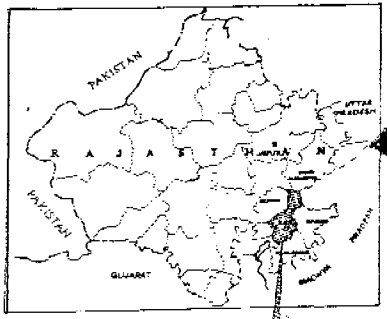
Chambal is the principal river running South West to North East and which touches the Kota city at North West side. It is a deep and wide river which is crossed by a causeway, an over-bridge and Barrage at Kota. It is the river Chambal which supplies fresh drinking water to the residents of Kota being a perennial river.

KOTA

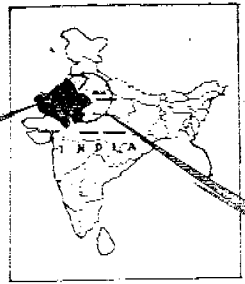
TOWN

* KOTA IN REGIONAL SETTING

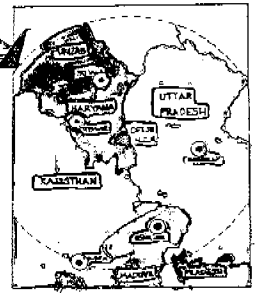
** KOTA TO ACT AS 'COUNTER MAGNET CITY' TO N.C.R.



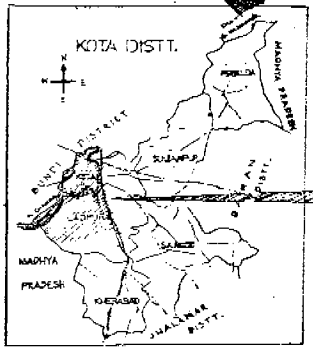
LOCATION OF KOTA DISTRICT IN CONTEXT WITH RAJASTHAN



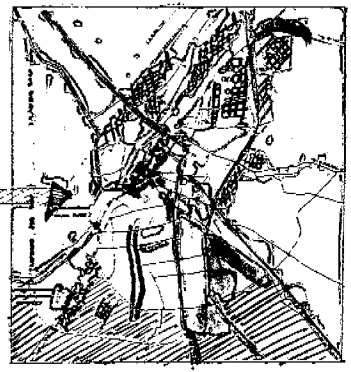
LOCATION OF RAJASTHAN IN COTEXT WITH INDIA



LOCATION OF KOTA IN CONTEXT WITH N.C.R.



LOCATION OF KOTA TOWN IN CONTEXT WITH KOTA DISTRICT



KOTA TOWN

LOCATIONAL MAP

PIYUSH KUMAR GOYAL | M.C.R.P. 2nd YR. 1990-92

THESIS PROJECT:
ANALYSIS OF INDUSTRIAL GROWTH AND URBAN STRUCTURE WITH EMPHASIS ON CAUSE-EFFECT RELATIONSHIPS - CASE STUDY : KOTA

DEPTT. OF ARCH. & PLNG., U.O.R.

(C) TANKS :

Kota city can also be named as the city of tanks or talaos. There are four tanks within the municipal limits i.e. Chhatravilas tank, Kotry tank, Soorsagar tank and Raipura tank. Chhatravilas tank is about 1/2 sq. miles and it is in the centre of the city. The construction of barrage over river Chambal has created a big reservoir and is the origin of Right main canal and Left main canal. The tanks are potential for industrial growth. The tanks have been a bliss to industries with their ample water storage and the sources of drinking water and recreation for the labourers living in nearby areas.

3.1.3 CLIMATE

Kota city has dry and hot climate. The summers are very hot and winters are dry and cold. From mid Nov. to Feb. the climate is cold while it is quite pleasant in March. From March end it begins to get hot and dry and by middle of June it is extremely hot and sultry. In a broad and generalised sense the climate is healthy and suitable for human habitation (except May and June) and industrial growth.

(A) TEMPERATURE :

January is the coldest month with the average daily maximum temperature of 24.3^0C and the average daily minimum of 10.6^0C. on account of cold waves in the wake of Western disturbance passing across North India. The minimum temperature drops to 2^0 to 3^0C above the freezing point of water . Both day and night temperature increase from March end to May (the hottest month). The mean daily maximum temperature and mean daily temperature reach to 42.9^0C and 29.3^0C respectively. In May and June before the onset of monsoon temperature may sometimes go up to 48^0C. The summer outcrop on the South of the city magnifies the heat in summers due to the presence of Vindhya sandstone rocks exposed to sun . The rock outcrop in the South of the city is the cause of hot winds even in the nights of summers.

(B) RAINFALL:

Kota city falls in the wet zone of the state of Rajasthan. The District as a whole enjoys comparatively good rainfall. The period from the middle of June to September is the South -West monsoon season and the two months Oct. and Nov. constitute the post monsoon or the retreating monsoon season. About 85 % of the whole rainfall occurs during the period from July to Sept. The rainy season in the city is very malarious and people go to the nearby.picnic spots to enjoy the glory and beauty of the nature. The average rainfall in the city during last three decades is given below.

TABLE 3.1

RAIN FALL IN KOTA

Year of census	1971	1981	1991
Rainfall(mms)	841.5	853.7	638.4

(C) HUMIDITY:

Relative humidity is lowest in April about 12 % and maximum in August which varies from 74 % to 81 % . Water bodies in the city give some feeling of comfort as the weather is dry for the maximum period in a year .

(D) PREVAILING WIND DIRECTION:

The predominant wind direction is from West to East both in the forenoon and in the afternoon. Other directions are from North-East to South-West and from South-West to North-East.The wind direction from South-West to North-East is predominant during rainy season.In winter the morning wind direction is from North-East to

South-West. The speedier wind blow is experienced in the month of April,May and June.

For the rest of the year winds from West to North-West are predominant.Wind speed generally does not exceed 5 miles per hour. This unidirectional wind flow enhances the suitability of location of smoke and odour producing industries.

3.2 GROWTH OF KOTA

3.2.1 Historical Growth of the Town

(A) KOTA IN AND BEFORE 1321 A.D.

About 700 years ago, Kota was a small settlement comprising of mud huts and small fort. It was situated along the right bank of the river chambal. The place was inhabited by Bhils, one of the wandering tribes of Rajasthan. It was named after a Bhil Chief 'Kotiah'. In 1321, the place consisted of a series of hamlets rather to say a tiny village of mud houses. The total area of the town was 134 acres, nearly 25 acres of which was occupied by residential quarters. Chhattar Bilas tank and a Shiv temple at Kansua are supposed to belong to the period of 8th century A.D.

(B) KOTA DURING 1321 A.D. - 1642 A.D.

During the year 1321, Jet Singh, the ruler of Bundi gave defeat to 'Kotiah'. He shifted his headquarters at this place from Bundi. He also constructed city wall. Existance of three tanks i.e.Kotri, Soor Sagar and Raipura also belong to this period.All these are located to South-East of Chhattar Bilas tank. First, Kotri tank is located at a distance of about half mile from Chhattar Bilas tank to South-East of it. Second, Soor Sagar. is over a mile away to the South East of Kotri. The third, Raipura talao is further to the South-East. Another special feature of this period is the construction of road which runs almost parallel to the river chambal between the two main settlement areas of the city namely Kota and Kotri.

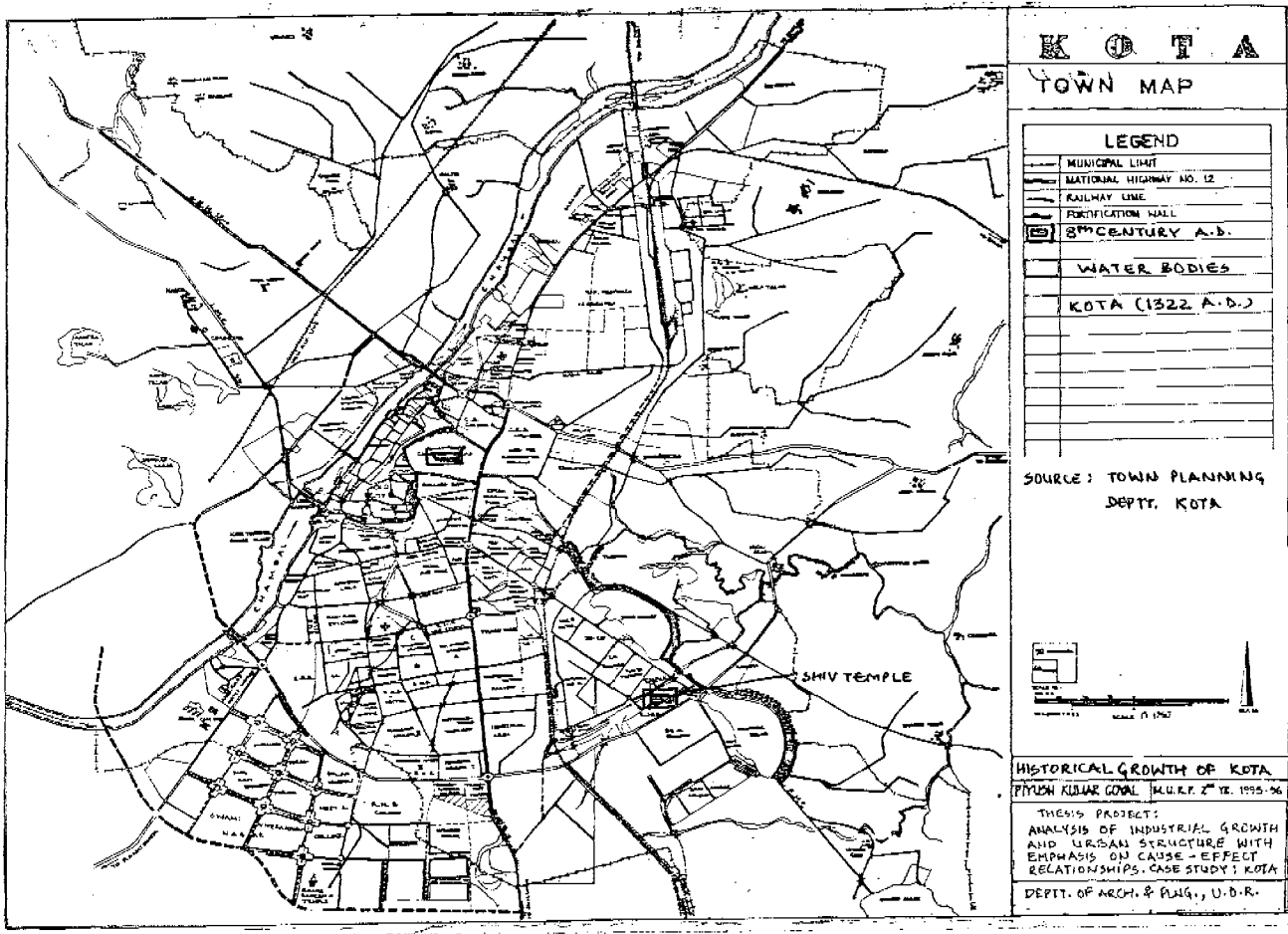
(C) KOTA DURING 1642-1947

The first railway line was laid in 1897 from Bina to Kota. Later on in 1909, railway line connecting Kota to Ragara and Mathura was laid during this period. Cemented roads were constructed and Kota Aerodrome was also constructed. By the end of this period, it became an education centre due to the opening of college, city high school, and other small institutions. Two small settlements Kunhari and Sakatpura also developed along the left bank of river.

(D) KOTA AFTER INDEPENDENCE :

As the railway helped in the growth of Kota during the Pre-independence period similarly Chambal project (which includes Gandhi Sagar dam, Rana Pratap Sagar dam, Jawahar Sagar dam, Kota barrage, right main & left main irrigation canals and network of their tributaries) led the growth dynamism during the post independence period by providing electricity and water supply to the town. The project was completed in 1960. The right main canal (total length about 372 kms.) and left main canal (total length about 168 kms) are the irrigation canals which bisect the city. After independence, as a result of country's partition, large number of refugees from West Pakistan moved into Kota. this population increase gave rise to some new residential areas and upcoming of some cottage industries within the walled city. Even today, the commerce and trade in Kota are dominated by the Sindhi community.

The land for industries was allocated in the South East part of the city in the Master Plan for Kota prepared in 1971, enabling industries to grow in a planned manner. The Industrial Areas and Industrial Estates were also proposed in the Master Plan.


K O T A
TOWN MAP
LEGEND
MUNICIPAL LIMIT
NATIONAL HIGHWAY NO. 12
RAILWAY LINE
FORTIFICATION WALL
8TH CENTURY A.D.
WATER BODIES
KOTA (1322 A.D.)
SOURCE : TOWN PLANNING DEPTT. KOTA
SHIV TEMPLE
HISTORICAL GROWTH OF KOTA
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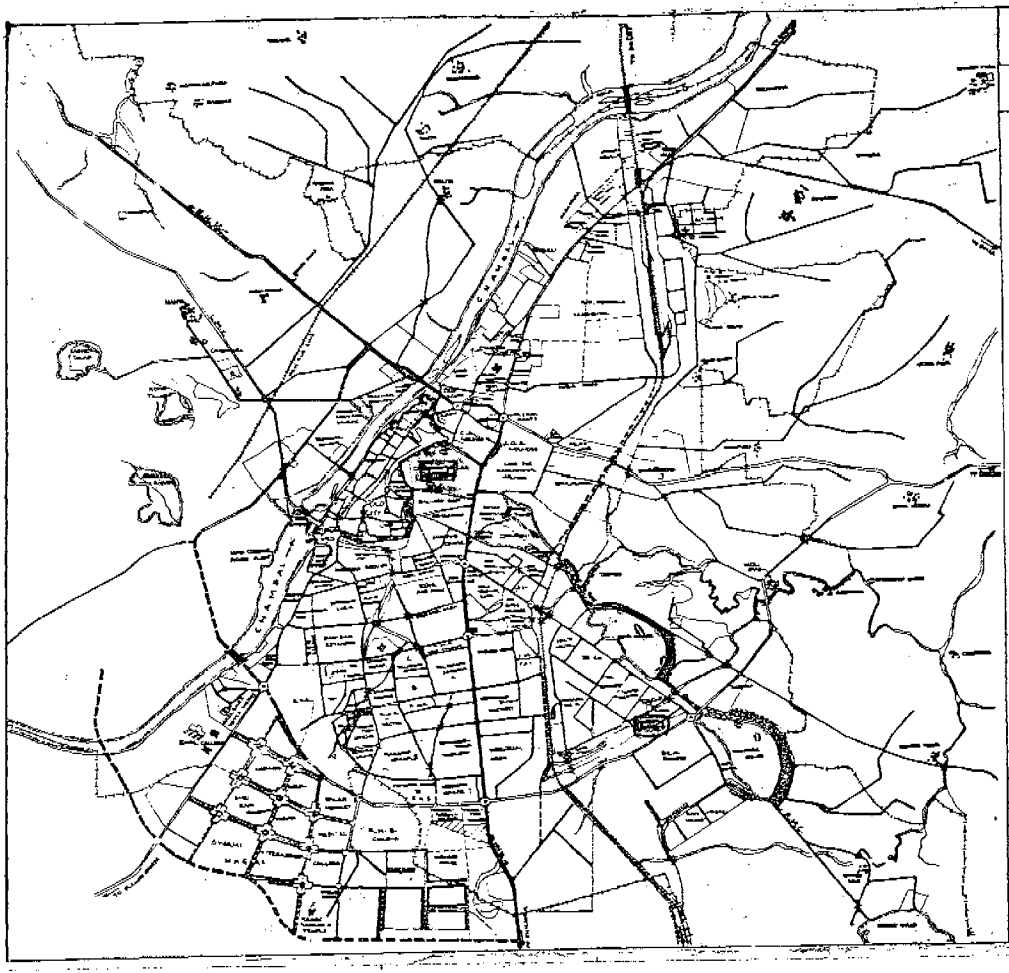

KOTA

TOWN MAP

LEGEND
MUNICIPAL LIMIT
NATIONAL HIGHWAY NO. 12
RAILWAY LINE
FORTIFICATION WALL
8TH CENTURY A.D.
WATER BODIES
KOTA (1642 A.D.)

SOURCE: TOWN PLANNING DEPTT. KOTA

SCALE IN 1760'

HISTORICAL GROWTH OF KOTA

PIYUSH KUMAR GOYAL | M.U.R.P. 2ND YR. 1995-96

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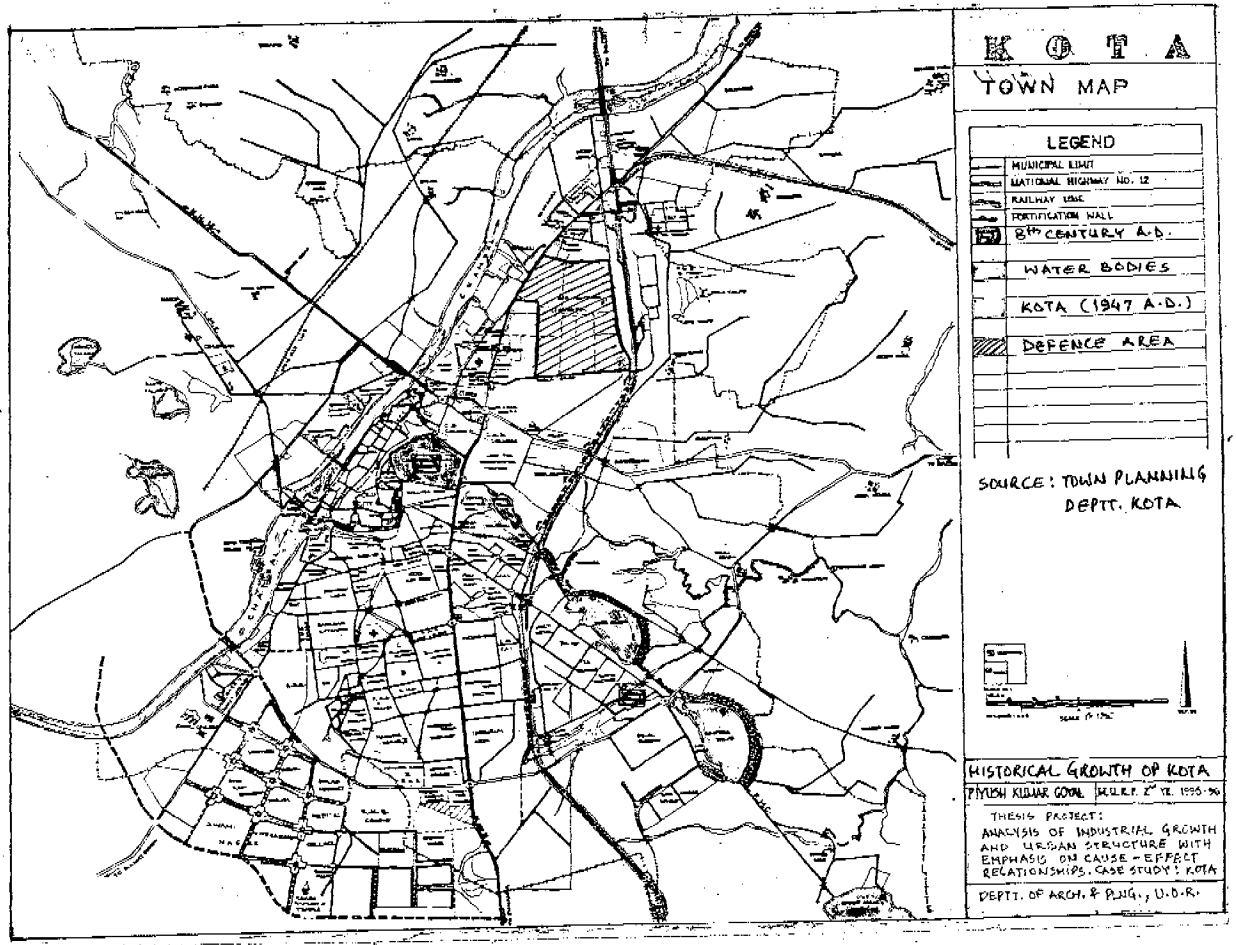
K O T A
TOWN MAP
LEGEND
MUNICIPAL LIMIT
NATIONAL HIGHWAY NO. 12
RAILWAY LINE
FORTIFICATION WALL
8TH CENTURY A.D.
WATER BODIES
KOTA (1947 A.D.)
DEFENCE AREA
SOURCE : TOWN PLANNING DEPTT. KOTA
HISTORICAL GROWTH OF KOTA
PIYUSH KUMAR GOYAL M.U.R.P. 2ND YR. 1995-96
THESIS PROJECT:
ANALYSIS OF INDUSTRIAL GROWTH AND URBAN STRUCTURE WITH EMPHASIS ON CAUSE-EFFECT RELATIONSHIPS. CASE STUDY : KOTA
DEPTT. OF ARCH. & PLNG., U.O.R.

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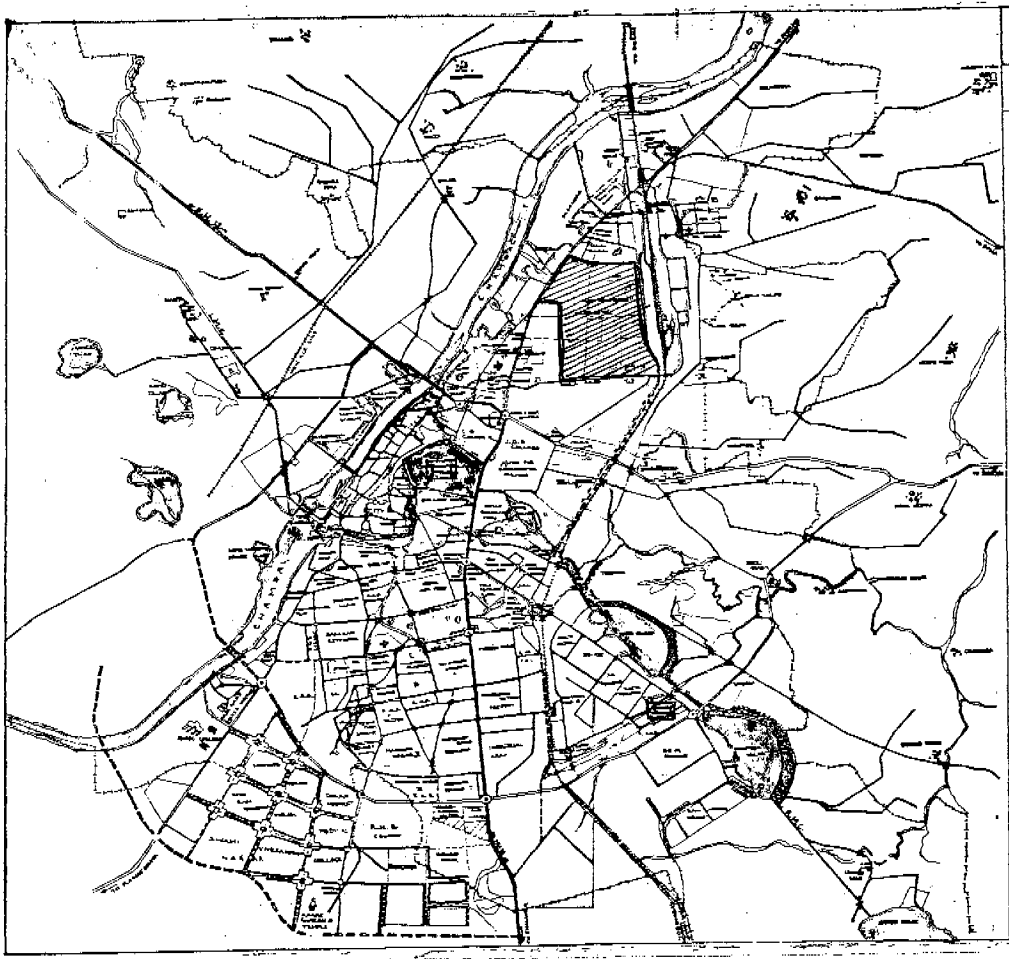

K O T A

TOWN MAP

LEGEND	
	MUNICIPAL LIMIT
	NATIONAL HIGHWAY NO. 12
	RAILWAY LINE
	FORTIFICATION WALL
	8th CENTURY A.D.
	WATER BODIES
	KOTA (1960 A.D.)
	DEFENCE AREA

SOURCE: TOWN PLANNING DEPTT. KOTA

SCALE N 1760

HISTORICAL GROWTH OF KOTA

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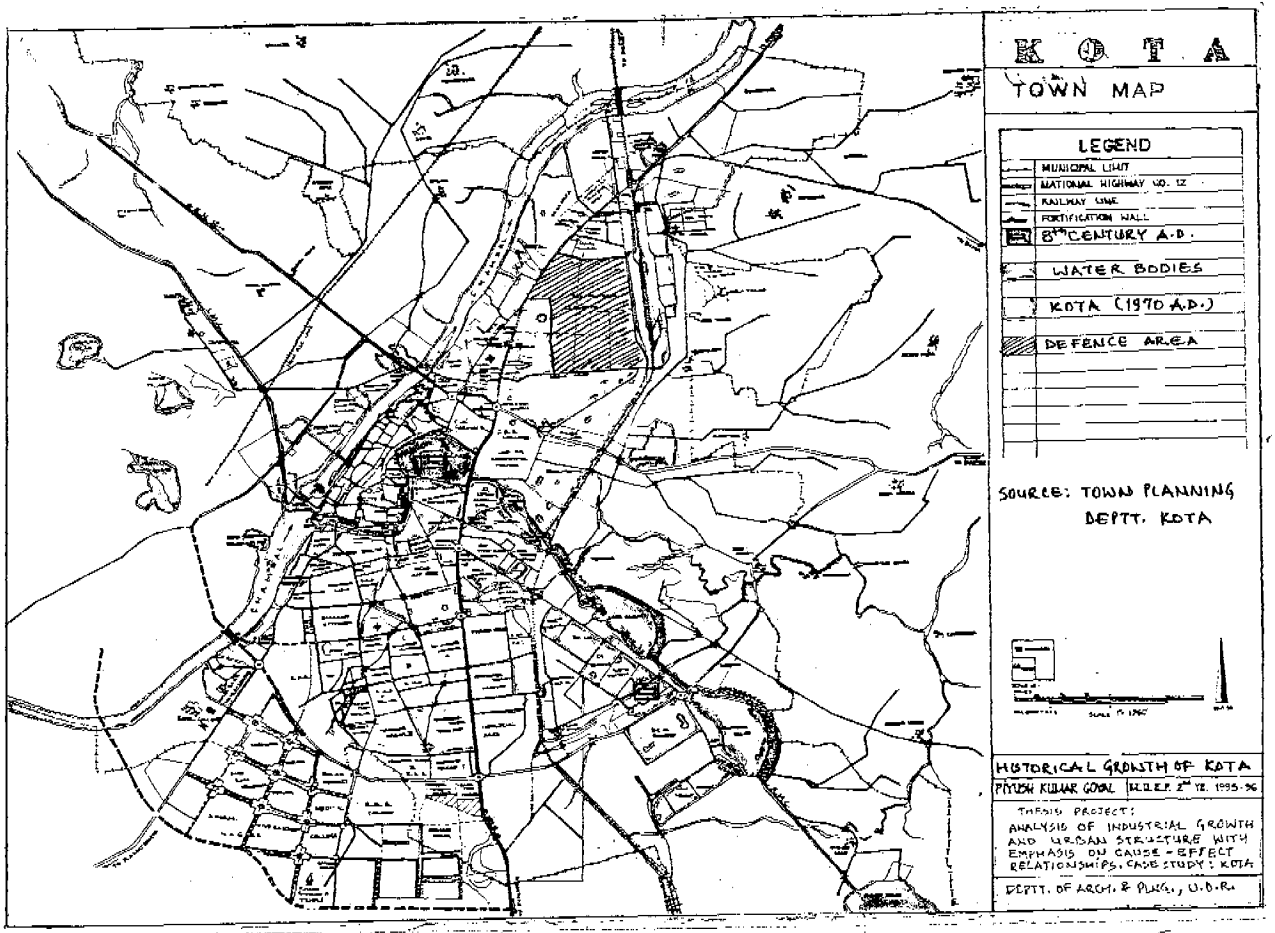
DEPTT. OF ARCH. & PLNG., U.O.R.


K O T A
TOWN MAP
LEGEND
MUNICIPAL LIMIT
NATIONAL HIGHWAY NO. 12
RAILWAY LINE
FORTIFICATION WALL
8TH CENTURY A.D.
WATER BODIES
KOTA (1970 A.D.)
DEFENCE AREA
SOURCE: TOWN PLANNING DEPTT. KOTA
HISTORICAL GROWTH OF KOTA
PIYUSH KUMAR GOGAL M.U.R.P. 2ND YR. 1995-96
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DEPTT. OF ARCH. & PLNG., U.O.R.

3.2.2 Physical Growth of the City

Kota entered the modern era after the construction of the railway line and development of the water works, the power house, airport etc. during early periods of 20th century (1921-51). It started expanding out side the walled city also. Bhimganj Mandi area was developed towards the North near Kota junction. Gumanpura towards East near Chhattar Bilas tank was also developed.

A large industrial area was established near Kansua village within the town, before the preparation of Master Plan. As a result of this expansion of Kota had been on the North-South axis between the walled city and the railway junction. Expansion also started along the East West axis towards the new industrial complex near Kansua village. Further development took place towards the South. It was during the last 40 years that various residential, commercial and industrial areas were developed and extended the urban limits of Kota to much larger dimension. Population grew from 33000 in 1901 to 5,37,371 in 1991. Between 1951 to 1971 physical expansion of city was negligible while population increase was tremendous.

Subsequently the 'Mehta Commission' under the chairmanship of Shri G.S. Mehta, recommended Kota for industrial development and gave maximum importance. As a result of it the city grew as the 'Industrial Capital of Rajasthan'.

Further, because of its ideal location in the regional setting and its potential to arrest some migratory flow towards Delhi, Kota in Rajasthan has been selected to act as 'counter magnet city' along with other four cities i.e. Hissar, Gwaliar, Patiala & Bareilly in other states.

3.2.3 Economic Structure

Kota is one of the most important regional, commercial and investment centre of Rajasthan. The headquarters of commissioner, chambal command area, divisional manager of Western Railway division are located here. This has been a centre of engineering

offices of Chambal Valley Development and main education centre. It has Open University, Engineering College, Medical College, Polytechnic College, I.I.T. and 3 degree colleges functioning here. This is also the main marketing city of chambal command area as it has a big mandi known as 'Grainery of Rajasthan'. The district is rich in the resources as it is endowed with major power installation and extensive canal irrigation network.

(A) MAJOR POWER INSTALLATION:

The district has two power plants (Thermal and hydel) within it. Moreover, two more power plants (atomic and hydel) situated at Rawatbhata (distt. Chittorhgarh) are just 40 km from the town. The details of these plants is enlisted below:

Plant

TABLE 3.2

MAJOR POWER PLANTS

NAME OF PLANT	NO. OF UNITS	INSTALLED CAPACITY	TOTAL CAPACIT
1. Kota Thermal Power Plant	5	2x100 MW 3x220 MW	860 MW
2. Jawahar Sagar (Hydel)	3	3x33MW	99 MW
3. Rana Pratap Sagar (Hydel) (Rawatbhata)	4	4x43 MW	172 MW
4. Rawatbhata Atomic Power Plant	4	2x190 MW 2x200 MW	820 MW
		Total	= 1951 MW

Source : R.S.E.B. Office, Kota

3.2.5 Demographic Pattern

Presently city ranks 3rd in the state according to the population of 1991. It was 4th rank and 5th rank in the state in the year 1971 and 1961 respectively. During 1901 and 1920 the population growth trend had been decreasing at a steady and slow rate . This may be due to the wide spread of epidemic all over the state .After 1921 there had been a positive growth trend in population . This reflects the increased importance of the town as the centre of commerce and trade . During 1941 and 1951 the city expanded at a relatively greater rate as the refugees from East Pakistan came into Kota as a result of partition of country. Rapid growth of the town took place after 1951. From Table No. 5.1 it is clear that the decadial growth rate had been maximum during the decade 1951-61. The decadial growth rate has been slowly but steadily decreasing afterwards but still it is alarming i.e. 50 % during the last decade (i.e. 1981-91). The growth of the town during 1951 to 1971 had an enormous pace which was due to the construction of barrage and its canal network. Subsequently, the industrialization has been the 'push' factor for the population concentration. The demand of space imposed by this population agglomiration for residential, commercial, industrial, institutional recreational and community facilities has enforced the city to start expanding its physical boundaries .

Chapter - 4

INDUSTRIAL POTENTIAL OF KOTA

4.1 INPUT FOR INDUSTRIAL GROWTH

Availability of inputs like land, raw-material, man power, market etc. and the scale of their availability plays an important and deciding role in the manufacturing process. The best location for industries to develop will be where these inputs combine in an opt manner. Therefore, Kota city has been evaluated in this context as follows:-

4.1.1 Land

The land is basic requirement for an industry and its allied uses such as storage of materials, parking, circulation and housing etc. The growing population and industrialisation make heavy demand on this resource as this also brings about social and economic changes. The industrialisation also attracts the rural population by offering better employment opportunities. It will be proper at this point to consider these demands and work out proper utilisation of land.

Apart from the Industrial land requirements the related requirements mentioned below also need to be catered which impose an extra burden on land

1. Residential
2. Commercial
3. Recreational
4. Industrial
5. Public & semi public institutional
6. Circulation

The 'Master Plan' for Kota (1971-91) envisaged the city to be developed as an industrial city and centre for trade besides being a regional administrative head quarter. River Chambal to the West and main Railway line to the East are some constraints for expansion of the city towards these sides. Moreover, except in south land is quite suitable for agriculture.

Thus, the city could expand southwards, which is also the growth direction of the

town. Fortunately, large chunks of barren land are in possession of Urban Improvement Trust (U.I.T), in the southern direction. Beyond these barren lands there are again forest lands. Hence, land availability has not been a formidable obstacle in the expansion of the city. Further, the area south-east of the town was found suitable for the industrial development. This was due to the general slope and prevailing wind directions in the town that helps in disposing the waste outside the city in natural drains and finally in the tributaries of river Chambal after treatment. As a result of it, though there have been such a sound industrial base in the city but it is not causing any major pollution hazards. As such, land availability was not a constraint for expansion of the industries also.

4.1.2 Raw Material

All industries require raw material which is the basis for the industrial production.The production process includes conversion of some thing into a product which has a greater utility. The generally available raw material in Kota and surrounding districts are as given below:

TABLE 4.1

AVAILABLE RAW MATERIALS

DISTT. NAME	AVAILABLE RAW MATERIAL
1.Kota	Lime-stone, sand stone, roof slabs, agricultural products, livestock products, coal, wood, tendu leaves, fire clay etc.
2.Bundi	Cement quality lime stone, poor quality iron ore, aluminous clay, silica, agricultural products etc.
3.Jhalawar	Aluminium clay, poor quality iron ore, silica, agricultural products etc.
4.Baran	Silica, agricultural products, livestock etc.

* Source : D.I.C., Kota.

There have been several small scale industries at Kota and around, which are agro-based, mineral based, wooden based and leather based which share more than 50% of total small scale industries (refer Table No. 4.4).

4.1.3 Man Power

The city has shown tremendous growth rates since industrialisation started. In addition to natural increase in population it is attracting immigrants, as a result growth of the city is much more than the natural growth.

Worker's population can broadly be divided in terms of skilled and unskilled workers. Unskilled workers have not been scarce at Kota as they are available in plenty within the region. Further a social, ecological and economical survey of Kota city, condcuted by University of Rajasthan, Jaipur reflects that the immigration from urban areas outside the Rajasthan has been more than the in-migration from surrounding rural areas into Kota. This was due to the fact that there was a scarcity of skilled, and technical personnel in the region, and hence,most of the entrerpreneurs came from outside the Rajasthan.

As a consequence of this migration, Kota has grown as an educational centre at the later stage and could achieve 60% literacy rate as per 1991 census. This could happen because of the awareness of the immigrated people for education. This is further reflected from the fact that the Kota district (including today's Baran district) has 38.5% literacy rate while the town has 60.15% as per 1991 census. During 1981 and 1991 census, the fall in population growth rate may be because of the availability of skilled and technical personnel within the district, due to which in-migration was reduced.

4.1.4 Market

On account of industrial infrastructural facilities and its nodality through multi-model transport network, Kota has acquired an ideal position as a centre for

trade and commerce having significant linkages with its hinterland.

There are several agro and livestock based industries which derive their raw material from the adjoining region and all over the state. These industries market their finished products all over India. For example, the paper and board mills manufacture a variety of products drawing straw and other agricultural products available within the region. Wool is manufactured from the rich livestock available in the state and is exported to mills throughout India. A number of industries are involved in quarrying, processing and marketing of 'Kota Stone' all over India and abroad. A large number of engineering and chemical industries have been established in Kota which have a regional market. Kota's economic influence transcends the state boundary in respect of several industrial products. Moreover, many small scale industries are engaged in making agricultural implements, steel furniture, auto-repair parts etc. catering to the demand of the urban area and those of hinterland.

Kota has become the most important centre in the region and a major trading centre in the state. it serves as a market place for the agricultural products having a big grain mandi. In addition, it also fulfil servicing functions (distributive) for its region and hinterland in respect of retail business. The importance of the town as a centre for trade and commerce have resulted in its good trade linkages within south-eastern region of the state and with other major trade centres in other states all over India.

4.1.5 Infrastructure

(A) CIRCULATION

With the development of Kota as the major industrial centre and with the anticipated substantial increase in agricultural output in Chambel command area there bound to be considerable increase in flow of people and goods in the region. It has efficient transport linkages within the region and hinterland as mentioned below.

City Roads

Within the city the road patterns has also been affected by its numerous growth. The Master Plan for Kota city came into force from 11th May, 1977. Since then Kota has been expanding in a planned manner and as a result of it the road network has not been creating any major traffic problems in newly developed areas, Except on the road from Central Bus Stand to Anantpura which is a part of National Highway No. 12 lying within the town. Roads and Circulation pattern within the old part of the city are haphazard and highly congested.

Regional Roads

Kota is located on National Highway No. 12 (connecting Jaipur and Jabalpur). The nearest sizeable urban settlements are Bundi and Jhalawar. Bundi is about 35 Kms. to the north-west of the N.H.12. Jhalawar lies on N.H.12 towards south-east. Further,Kota has direct road link with the atomic town Rawatbhata (district Chittorhgarh). Via these routes Kota has direct road links with Jaipur,Ajmer,Jodhpur,Udaipur,Chittorhgarh,Bhilwara etc.in Rajasthan.It is also connected with Jabalpur,Bhopal and Indore in Madhya Pradesh.

Railways

It is an important Railway junction of Western Railways on Delhi-Bombay main Railway line. Kota also has broad gauge railway line connection with Bina, Chittorhgarh and state capital Jaipur. Recently, Jaipur - Madras direct train service(via Kota)has been announced by the government which will start functioning from 1st. april, 1996. This route will open new vistas of trade opportunities between Kota and South India. The importance of this city has been recognised by railways, and hence, the stoppage of super fast trains e.g. Rajdhani Express, August Kranti Express in addition to other important trains e.g. Frontier Mail, Bombay-Jammutavi superfast etc. are kept at this railway station.

Aerodrome

The airport at Kota was started in 1958.It has 400ft.* 150ft. runway. This airport has a status of "Controlled-Air-Field", where air traffic control services are provided.Before 1988 there had been flights for Jaipur and Delhi through Indian Air Lines and Vayudoot seva. Then it remained closed up to Aug.'94. On 18 th. Sept. 1994 Jagson Airlines again started domestic flights for Jaipur and Delhi.Because of inavailability of passengers the operation was again closed in April 1995.

At present the airport is being prepared to emerge as a training centre for commercial pilots, as, recently about Rs.2 crores have been spent to develop this airport for fulfilling the needs of Rajputana Flying Club.

Airport authority at Kota has three wings, the functions of which are as below:-

Wing	Function
1. Aerodrome	Air traffic Control
2. Aeronautical Communication	Provisional Navigational communication Links & Their Maintenance
3. Engineering	Construction Wing

* Source : Airport Authority, Kota.

(B) ELECTRICITY

With higher growth rate of the city there had been a substantial increase in demand for power, both for industrial as well as domestic consumption. As mentioned earlier, Kota has in close vicinity some of the major power generation stations like Rana Pratap Sagar Dam, Gandhi Sagar Dam, Jawahar sagar Dam and Rawatbhata Atomic Power plant besides Kota Thermal Power Plant (located within the town). These plants have a total installed capacity of about 2000 MW.

Hence the whole region is endowed with abundant power supply. At present it has enough (24 hours supply) electricity supply to meet all industrial, commercial and domestic needs and also has a potential to generate electricity for future needs.

(C) WATER SUPPLY

Kota is situated on the bank of a perennial river Chambal. Due to construction of Kota barrage on it, a large reservoir has been created in the immediate vicinity of the town .Right and Left main canals, taking off from the barrage make possible the availability of water for irrigation at convenient points. Moreover, there have been four tanks which feed Right main canal these are Chhattar Bilas, Kotri, Soorsagar and Raipura tanks.These tanks had also fulfilled the needs of industries during early periods of industrialisation.

At present 1400 lakh litre water is being supplied per day to the town. Further, town also has some spot sources which cover an estimated 5% population. These are :

(i) Hand pumps - 93

(ii) Tube wells - 26

(iii) Bawaries - 3

With ample water availability in the town, it can be said that water supply will not be a constraint for the future demands imposed due to growth of the town.

(D) SEWERAGE AND DRAINAGE:

Disposal of waste water and consequently drainage condition within the city are quite unsatisfactory even though the topography provides very good possibilities. Kota city has a partial coverage of sewerage and drainage facilities. A partial sewerage scheme was framed and sanctioned in the year 1979 costing Rs.158 lakhs. The works of laying and jointing 18.20 kms of sewer lines and construction of 2 nos. sump wells were completed against the provisions of the scheme. Sewer lines mainly exist in the colonies developed by Housing Board. There is no sewer line in rest of the city and the residents are dependent either on old conservancy system (within walled city)or on their individual septic tanks(in colonies developed by U.I.T.)provision. Further, the effluent from septic tanks are being discharged into open drains though

it is not allowed as per norms. This open drainage phenomena is causing serious health hazards as they are causing mosquito breeding, pollution and odour nuisance.

Most of the large and medium scale industries have their own waste treatment plants to fulfill the criteria imposed by the Rajasthan State Pollution Control Board.

4.2 INDUSTRIAL GROWTH OF THE TOWN

From the discussion in the preceding section, it is clear that the rapid growth of industries in Kota has been due to following facts:

1. Availability of land.
2. Availability of unskilled labourers.
3. Abundant supply of water.
4. Availability of power.
5. Availability of good marketing facilities within the district, state and all over India.
6. Availability of good communication and transportation networks.

Though today, Kota has emerged as the nodal point for major industries developed in the state, with the provision of large scale and small scale Industries Areas and Industrial Estates. But from the point of view of locational aspects, Kota can be divided into two parts. First prior to 1960 A.D. the industries developed in the older part of the city in haphazard way in absence of any policy.Second, industrial zones demarcated after 1960 where industries have come up in an organised way due to the enforcement of Master Plan. Chronological growth of industries in the town is shown in illustrations.

4.2.1 Industrial Growth Before 1960

In the first decade of the century an attempt at mechanisation started in the

field of manufacturing. A vegetable oil mill was the first industry to be set up in 1908. Most of the industrial activities during the first six decades were concerned with processing of sand and glass-sand. The thermal power plant was started in 1926 followed by city water works plant in 1927. A small plant that had been manufacturing pilfer proof real and crown was set up in 1942 by a Parsi Merchant of Bombay.

(A) SHRI GOPAL INDUSTRIES

'Shri Gopal Cotton Textile Mills Ltd' was established in the year 1944 at Kota. It is located on Rangpur road near Railway Station. In 1956 this mill was purchased by Bangurh Somani Group, the prominent industrialist of country, and renamed as 'Shri Gopal Industries'.

Further, the name of this industry was again changed as ' Sudarshan Textiles'. Since March 1985, the unit is out of production due to some internal matters.

(B) INDUSTRIES IN OLD PARTS OF CITY

Industrial establishments in the old parts of the city were mainly established before 1960. These units were scattered all over the town.

Small scale and cottage industries like flour mills, bidi manufacturing, iron and steel fabricators, utensil manufacturing, furniture manufacturing, pattal dona (plates and bowls made of tree leaves) manufacturing, ice factory, bakeries etc. were established with in the walled city, which are still existing. These industries are situated in Chota Talao area, in main market and in narrow streets leading to residences. These industries do not have any open spaces within their premises and are very congested. Industries which are situated outside the walled city are mostly found in Gumanpura, Chhawni, Nayapura, Aerodrome circle and industrial area. A railway wagon repair workshop was established in the year 1957 near railway station.

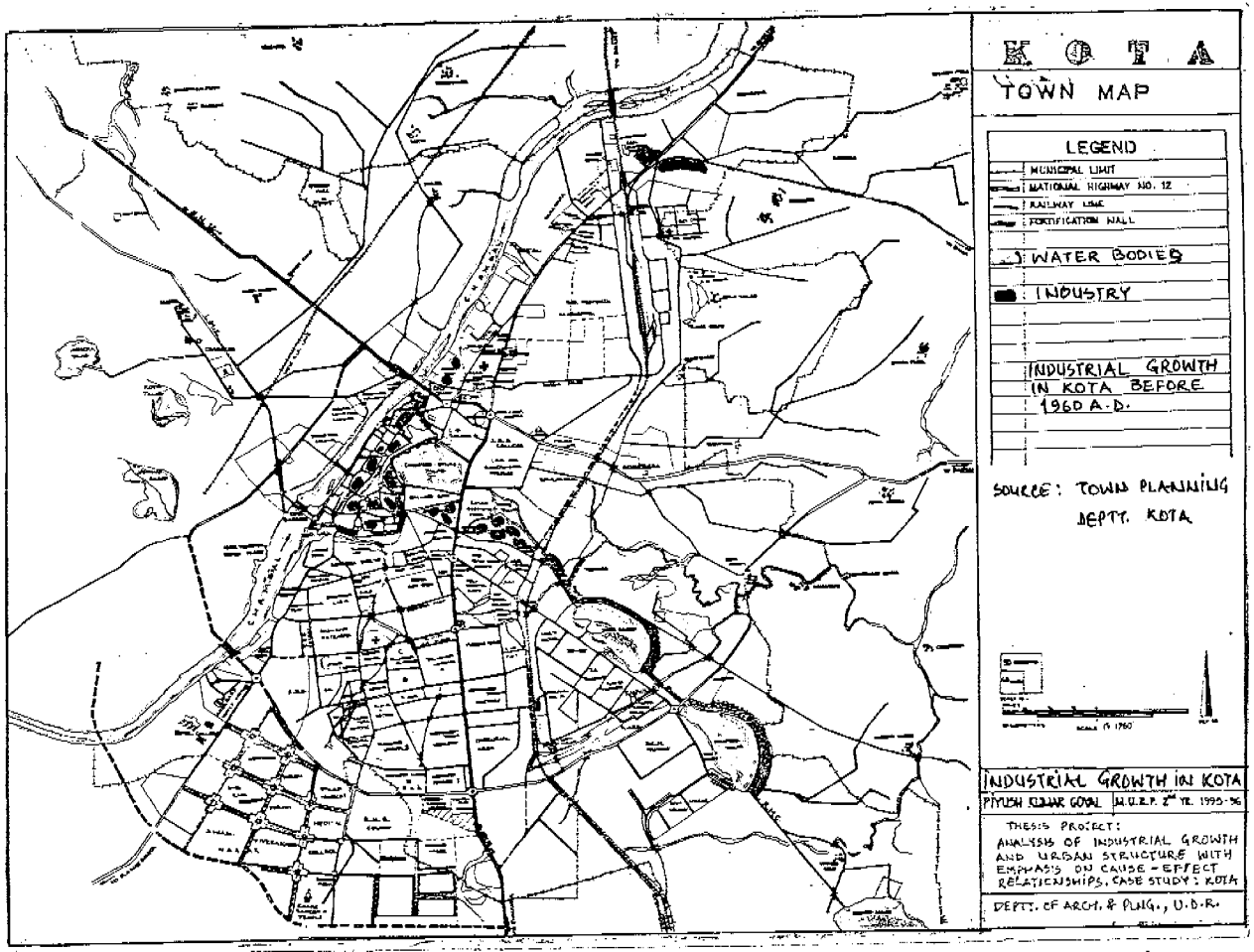
4.2.2 Industrial Growth After 1960

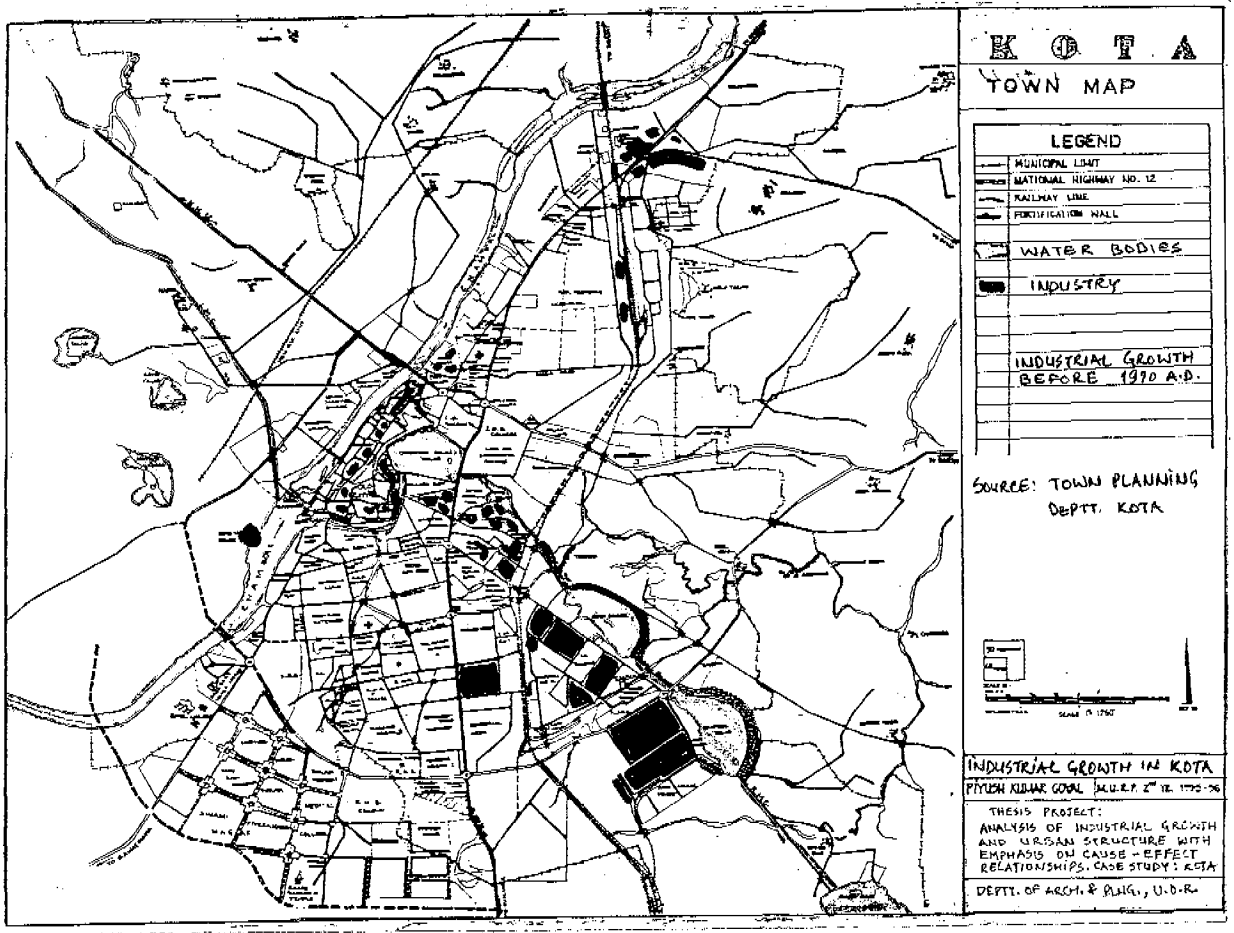
Rapid industrialisation started after 1960. By this time Kota barrage, Rana Pratap Sagar and Gandhi Sagar Dam had already been constructed. Further, the state government introduced some incentives to attract the enterpreneurs to establish the industries which added impetus to the industrialisation. In the second five year plan (1956-61) for Rajasthan, licenses were sanctioned by the Govt. of India for establishment of J.K. Factory, Shri Ram Fertilizer, Calcium carbide, P.V.C. and caustic soda plant etc. which were decided to be located at Kota by the state government. Further, in the 3rd five year plan (1961-66) for Rajasthan there was a proposal to start power supply for irrigation purposes from the Chambal project to facilitated the farmers to utilize better marketing facilities available at Kota. The state government also proposed the development of roads connecting remote interiors around Kota to Kota town. This enhanced the agro based commercial activities at Kota which further led to establishments of agro based industries.

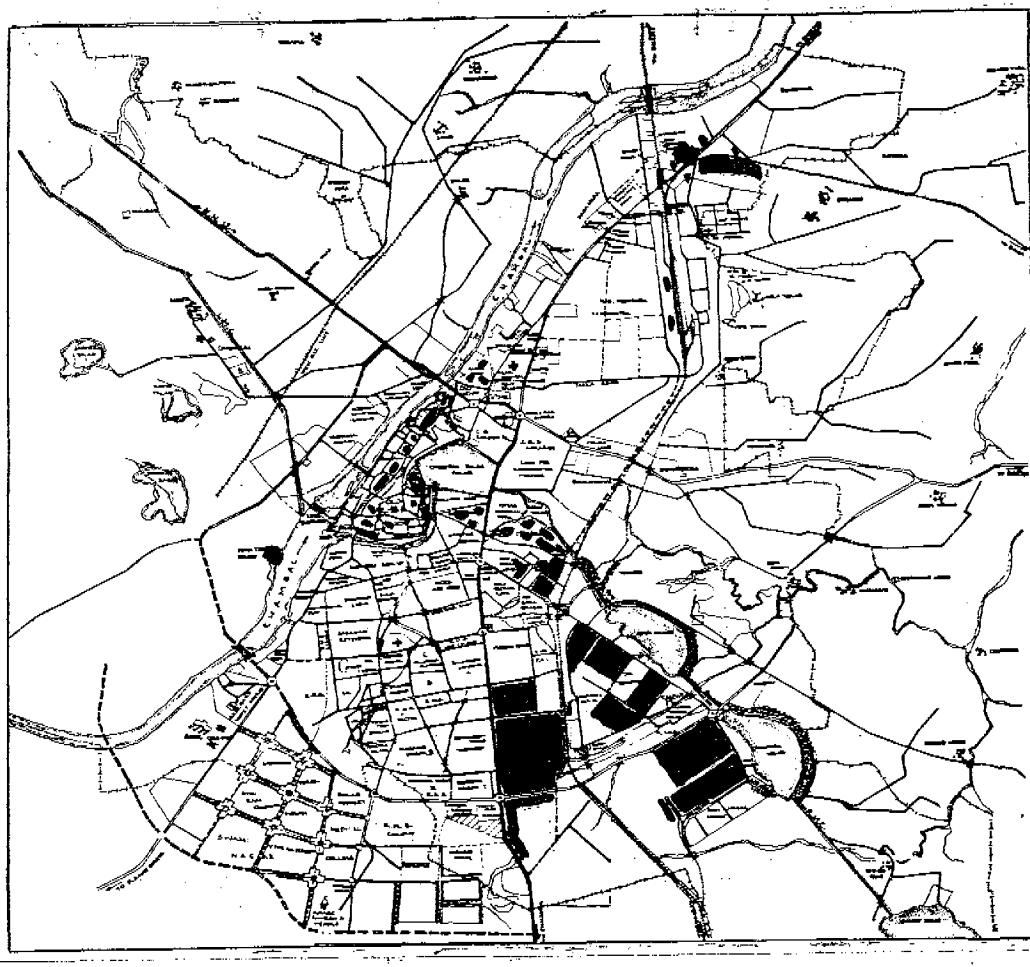
During this period an Industrial Estate at Kansua within the town was established to encourage the small scale industrial units. Hence, this was the time when concept of establishing Industrial Areas and Industrial Estates had been introduced to regularise the development of the town in a planned manner, and to root away the ill effects of industries on the urban structure.

4.3 EXISTING INDUSTRIAL STRUCTURE

Industrial areas have been proposed at two locations viz. near railway station in the north and towards south of right main canal, in order to achieve a more rational and balanced contribution of principal work centres. From the point of view of wind direction, natural slope and accessibility, the north and south directions have been found to be most appropriate for industrial location. At present there are 14 industrial areas in the district out of which 10 are located within the Kota


K O T A
TOWN MAP
LEGEND
MUNICIPAL LIMIT
NATIONAL HIGHWAY NO. 12
RAILWAY LINE
FORTIFICATION WALL
WATER BODIES
INDUSTRY
INDUSTRIAL GROWTH IN KOTA BEFORE 1960 A.D.
SOURCE: TOWN PLANNING DEPTT. KOTA
INDUSTRIAL GROWTH IN KOTA
PYMSH REGIONAL GOAL M.U.D.P. 2nd YR. 1995-96
THESIS PROJECT:
ANALYSIS OF INDUSTRIAL GROWTH AND URBAN STRUCTURE WITH EMPHASIS ON CAUSE-EFFECT RELATIONSHIPS, CASE STUDY: KOTA
DEPTT. OF ARCH. & PLNG., U.D.R.


K O T A
TOWN MAP
LEGEND
MUNICIPAL LIMIT
NATIONAL HIGHWAY NO. 12
RAILWAY LINE
FORTIFICATION WALL
WATER BODIES
INDUSTRY
INDUSTRIAL GROWTH BEFORE 1970 A.D.
SOURCE: TOWN PLANNING DEPTT. KOTA
INDUSTRIAL GROWTH IN KOTA
PIYUSH KUMAR GOEL M.U.R.P. 2ND YR. 1975-76
THESIS PROJECT:
ANALYSIS OF INDUSTRIAL GROWTH AND URBAN STRUCTURE WITH EMPHASIS ON CAUSE - EFFECT RELATIONSHIPS. CASE STUDY: KOTA
DEPTT. OF ARCH. & PLNG., U.O.R.



K O T A

TOWN MAP

LEGEND
MUNICIPAL LIMIT
NATIONAL HIGHWAY NO. 12
RAILWAY LINE
FORTIFICATION WALL
WATER BODIES
INDUSTRY
INDUSTRIAL GROWTH 1981 A.D.

SOURCE: TOWN PLANNING DEPTT. KOTA

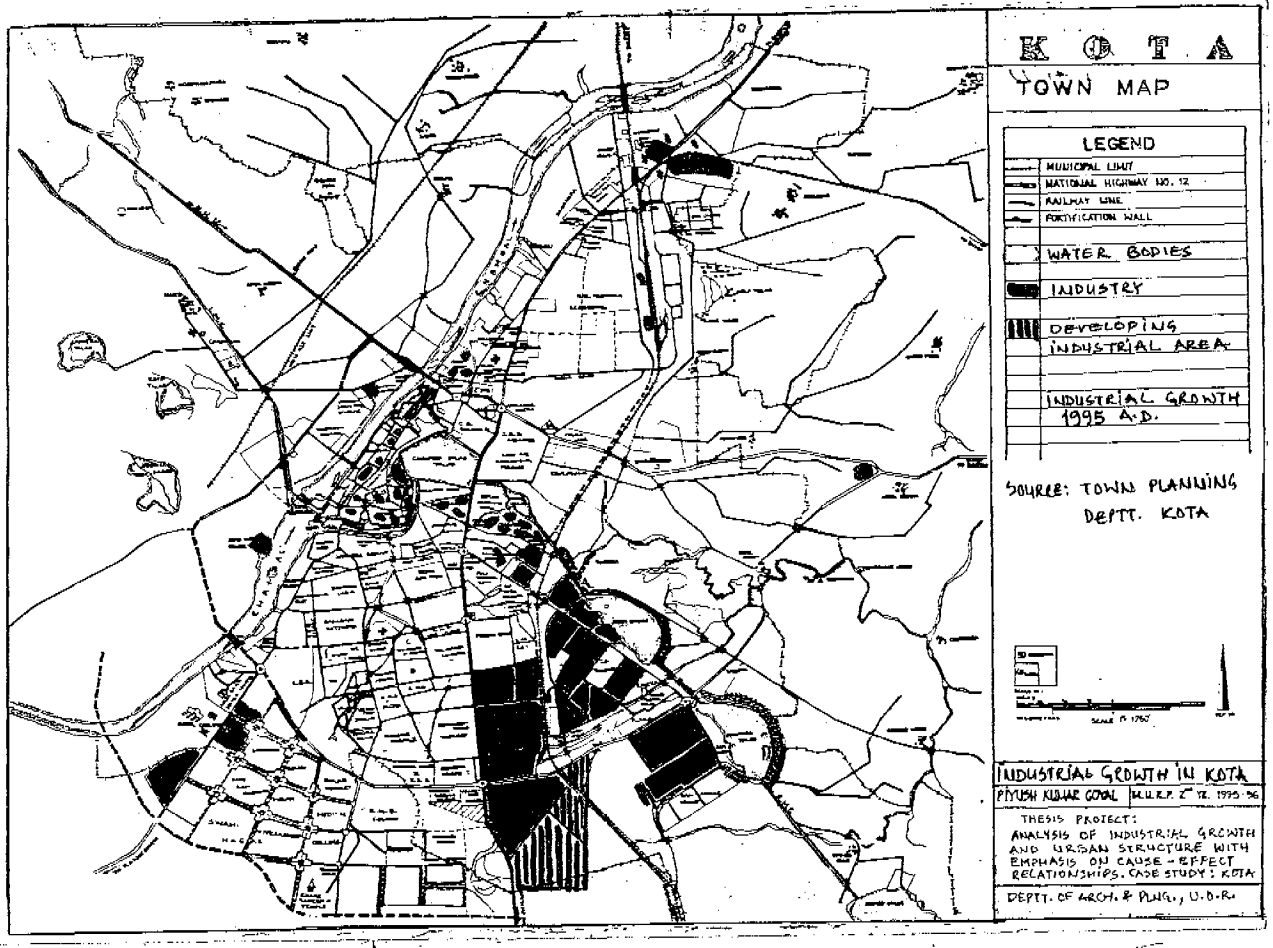
INDUSTRIAL GROWTH IN KOTA

PIYUSH KUMAR GOEL | M.U.R.P. 2nd YR. 1995-96

THESIS PROJECT:
ANALYSIS OF INDUSTRIAL GROWTH AND URBAN STRUCTURE WITH EMPHASIS ON CAUSE - EFFECT RELATIONSHIPS. CASE STUDY : KOTA

DEPTT. OF ARCH. & PLNG., U.O.R.

42(c)


K O T A
TOWN MAP
LEGEND
MUNICIPAL LIMIT
NATIONAL HIGHWAY NO. 12
RAILWAY LINE
FORTIFICATION WALL
WATER BODIES
INDUSTRY
DEVELOPING INDUSTRIAL AREA
INDUSTRIAL GROWTH 1995 A.D.
SOURCE: TOWN PLANNING DEPTT. KOTA
INDUSTRIAL GROWTH IN KOTA
PIYUSH KUMAR GOYAL
M.U.R.P. 2ND YR. 1995-96
THESIS PROJECT:
ANALYSIS OF INDUSTRIAL GROWTH AND URBAN STRUCTURE WITH EMPHASIS ON CAUSE - EFFECT RELATIONSHIPS. CASE STUDY : KOTA
DEPTT. OF ARCH. & PLNG., U.O.R.

42(d)

town. The details of these areas are as follows :

TABLE 4.2

INDUSTRIAL AREAS AT KOTA

S.No.	Name of Industrial Area	Land Acquired (in Acres)	Land Developed (in Acres)
1.	Indraprastha	938.00	719.42
2.	Multi Metal	96.06	94.89
3.	Railway Crossing	9.12	7.03
4.	Old Industrial Estate	28.50	28.50
5.	Small Scale Ind. Area	47.55	47.55
6.	Furniture Ind. Area	4.60	4.60
7.	Large Ind. Area	930.00	930.00
8.	Electronic Ind. Area	37.00	37.00
9.	Bhimpura	83.29	–
10.	Nanta	29.88	–

* Source :D.I.C., Kota.

Among these industrial areas many large, medium and small scale units are set up. At present there are 20 large and medium scale, 4101 small scale and 2312 tiny industries are located at Kota. Details of these are given below:

TABLE 4.3

INDUSTRIES AND THEIR CLASSIFICATION

Category	Classification Criteria (Investment on M/c) in Rs.	No. of units	No. of persons empolyed
Large scale	Above 5 crores	13	16121
Medium scale	Above 60 lakhs below 5 crores	7	
Small scale and ancillary	Above 5 lakhs Below 60 lakhs for SSI below 75 lakhs for ancillary units	4101	14603
Tiny industries	Below 5 lakhs	2312	4368

* Source: D.I.C.,Kota (data as on March, 1994).

Employment distribution as indicated in the above table is also represented in the form of Pie-Chart.

Following table gives details of existing small scale industrial units and artisan units in the town.

TABLE 4.4
SMALL SCALE AND ARTISAN INDUSTRIES

S.No.	Type of Industry	No. of units	Investment (lakhs)	Employment
1.	Agro Based	428	576.30	1755
2.	Tobacco soda water	7	5.94	53
3.	Cotton textile	25	15.62	85
4.	Woolen,silk and artificial thread based clothes	121	56.85	318
5.	Jute & jute based	4	5.97	50

Contd...

S.No.	Type of Industry	No. of units	Investment (lakhs)	Employment
6.	Ready made garments & embroidery	208	29.13	508
7.	Wood/wooden based	615	129.27	1626
8.	Paper & paper based	101	73.96	400
9.	Leather based	710	60.84	1739
10.	Chemical based	112	212.85	679
11.	Rubber,plastic petro based	107	269.21	618
12.	Mineral based	772	1051.92	3287
13.	Metal based	489	266.44	1745
14.	Engg. units	122	130.92	878
15.	Electrical m/c & transport equipments	40	113.90	188
16.	Repairing & servicing	189	67.99	517
17.	Others	51	18.06	161
	Total	4101	3114.97	14603

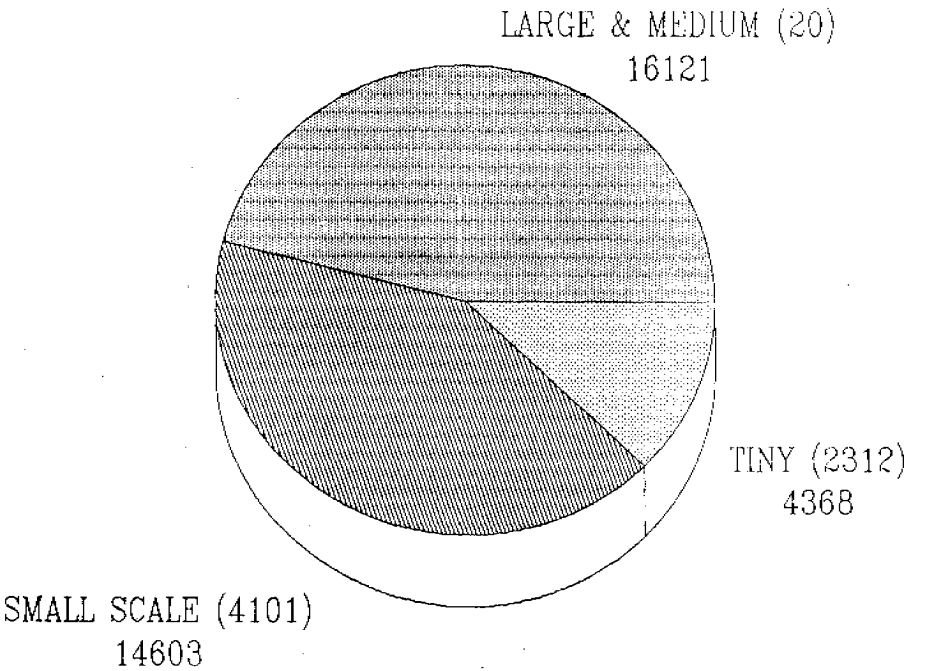
* Source : D.I.C., Kota (Data as on March, 1994).

A Bar-Chart showing the above distribution is also drawn.

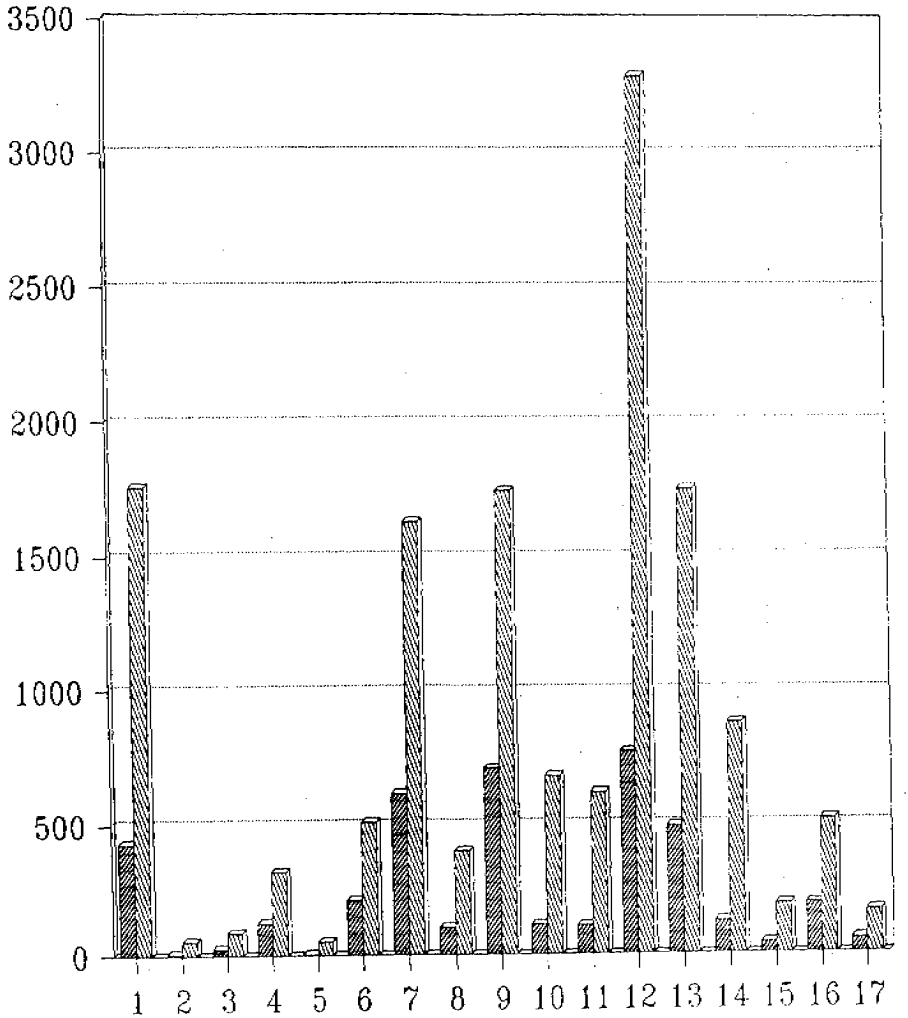
The following table gives the details of small scale units registered during 1985-86 in 1993-94.

EMPLOYMENT IN INDUSTRIES
(AS ON MARCH 1994)

SOURCE : DISTRICT INDUSTRY CENTRE, KOTA

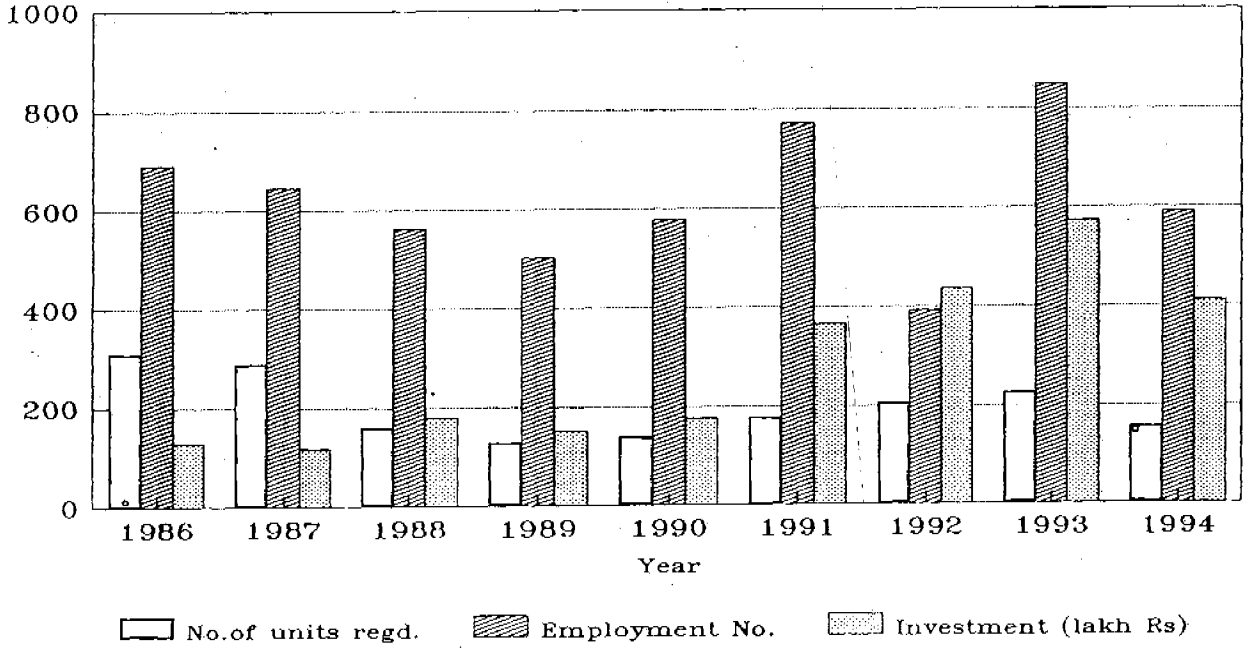


SMALL SCALE INDUSTRIES
CLASSIFICATION & EMPLOYMENT
(FOR TYPE OF INDUSTRY REFER TABLE 4.4)



SOURCE : DISTRICT INDUSTRY CENTRE, KOTA

SMALL SCALE UNITS REGISTERED IN KOTA DURING 1986 TO 1994



SOURCE: District Industry Centre,KOTA

TABLE 4.5

RECENT TREND OF S.S.I. ESTABLISHMENTS

Year	No. of units registered	Employment (Lakhs)	Investment
Before 1985	2306	9023	478.35
1985-86	310	691	129.02
1986-87	288	646	117.91
1987-88	161	562	180.01
1988-89	128	501	151.95
1989-90	140	577	176.57
1990-91	177	772	364.85
1991-92	206	392	434.41
1992-93	226	849	571.3
1993-94	159	590	410.8
Total	4101	14603	3114.97

* Source : D.I.C.,Kota.

This is illustrated in the Bar-Chart also.

Further there has been a strong base of large and medium scale industries details of which are given in the table below:

TABLE 4.6
LARGE AND MEDIUM SCALE INDUSTRIES

S.N.	NAME OF UNIT	NAME OF PRODUCT	DATE OF PRODUCTION	GROSS CAPITAL INVESTMENT		EMPLOYMENT NO.
				FIXED	WORKING	
1.	J. K.TYRE--CORD	NYLON TYRE CORD YARN FABRIC	1/1/72	4107.98	1000.00	768
2.	J .K. ACRYLICS	ACRYLIC FIBRES	1/7/80	5577.12	648.63	620
3.	PADAM SYNTHETICS LTD.	1. NYLON YARN 2. POLYSTER YARN	12/3/62 13/10/68	16248.00	3150.00	1891

CONTD...

S.N.	NAME OF UNIT	NAME OF PRODUCT	DATE OF PRODUCTION	GROSS CAPITAL INVESTMENT		EMPLOYMENT NO.
				FIXED	WORKING	
4.	J.K. STAPLE & TOWS	POLYSTER STAPLE FIB	15/11/71	4095.00	3193.00	532
5.	GOPAL SYNTHETICS	POLYSTER STAPLE FIB	21/3/86	6124.00	309.00	300
6.	SRI RAM CEMENT	CEMENT	1/07/87	2769.00	630.00	214
7.	SHRIRAM FERT.& CHEM.	CALCIUM	9/12/63	11199.00	5403.00	2077
8.	SHRIRAM RAYONS	RAYON	25/01/65	4204.00	2053.00	1426
9.	MULTIMETALS LTD.	COPPER BASE TUBES	01/11/66	1394.00	643.00	395
10.	MANGALAM CEMENT LTD.	CEMENT	01/03/81	6690.00	2485.00	811
11.	NEER SHREE CEMENT	CEMENT	27/03/94	11929.60	1667.70	297
12.	I.L.LTD	ELECTRONICS ITEM	01/10/68	4039.50	1022.00	2251
13.	SAMCOR GLASS LTD	GLASS PARTS & SHELLS	12/01/93	16429.00	1391.00	920
14.	KOTHARI GLOBAL LTD.	REFINED OIL	22/06/92	1153.20	2796.00	120
15.	TILAM SANGH RAJASHTAN	S.E.SOYA OIL	23/08/88	2479.00	2782.00	171
16.	CHAMBAL FERTI.	AMMONIA UREA	01/01/94	126700.00	2500.00	613
17.	MAKAN AGRO OIL LTD.	SOLVENT OIL	07/03/94	827.30	930.00	44
18.	OM METALS LTD.	ALLOY STEEL	31/03/90	118.40	30.00	50
19.	KUSUM AGRO. TECH.	SOLVENT,VEG. OIL	01/04/94	1302.16	1200.00	80
20.	OM METALS & MINERALS	C.R.SHEET	07/08/92	2172.00	20.00	40

* Source : D.I.C., Kota (Data as on March, 994).

These industrial units are engaged in the manufacturing of wide variety of items. These are processed products of copper, copper based alloys, tubes, rods, straw board, nylon yarn, tyre cord, synthetic staple fibre, cotton yarn, electric cables, chemical products (e.g. sodium disulphide, sodium sulphate, sulphuric acid etc.), fertilizers, T.V. picture tubes and complete range of instruments.

Besides, small scale and ancillary units are engaged in the production of food/beverage items, textile, wooden based products, printing and polishing, leather products, plastic products, rubber products and engineering goods.

4.3.1 Export Items

A number of industrial products are being exported every year from Kota. These include tyre yarn, tyre cord, fabric, polyster and nylon filament yarn, staple fibre, electronic instruments (i.e. transmitters, recorders, control valves, controllers and other associated equipments), caustic soda, flakes, P.V.C. resins, copper and copper based tubes, cement, deoiled cake, Kota stone and tiles,small telephone exchanges etc. The total value of exports during 1992-93 was about Rs.70 crores.

4.4 AVAILABLE RESOURCES IN KOTA DISTRICT

4.4.1 Agricultural Resources

Agriculture provides livelihood to 26.05% of the total population as cultivators or agriculture labourers. The main agricultural products are tabularized as below:

TABLE 4.7
AGRICULTURAL PRODUCE

S.No.	Crop	Production in tonnes (1992-93)
1.	Wheat	184227
2.	Rape & mustard	120802
3.	Soyabeen	71655
4.	Coriander	33988
5.	Jawar	33836
6.	Gram	20613
7.	Rice	19906
8.	Maize	11545
9.	Kharif pulses	11327
10.	Others (e.g. Rabi pulses sugarcane,bajra, barley,etc.)	52986

* Source : District Statistical Handbook (1994), Kota

4.4.2 Livestock Resources

The following table gives the livestock population for 1992-93 livestock census.

TABLE 4.8

LIVESTOCK POPULATION (1992-93)

S.No.	Description	Livestock Population (1992-93)
1.	Cattle	687851
2.	Goats	185754
3.	Buffaloes	142944
4.	Sheep	30994
5.	Dogs	21144
6.	Pigs	1673
7.	Camels	2633
8.	Donkey	1628
9.	Horses,ponies,mules	891
	Total	687851

*Source : District Statistical Handbook (1994), Kota.

The livestock resources of the district make possible the supply of wool, meat, hides, skins, bones, milk etc.

4.4.3 Mineral Resources

The district is rich mainly in the non-metallic minerals. they are as follows:

TABLE 4.9

MINERAL RESOURCES

S.No.	Name	Production in 1993 (Tonnes)
A.	Major Mineral	
1.	Limestone (Kota stone)	324495.00
B.	Minor mineral	
2.	Sand stone/Katla patti	42397.00
3.	Masonry stone	240955.00
4.	Kankar bazri	20814.00
5.	Lime stone (burning)	56619.00
6.	Brick soil	1.16
7.	Miscellaneous	96.00

*Source : District Statistical Handbook (1994), Kota.

4.4.4 Forest Resources

The forest covers 22.34% of the total geographical area of the district. These forests are mainly in the south-western and central portions on the Mukundara hills. These forests are not rich in produce as except some species of wood no important product is available. Some minor forest produce are grass, gum, tendu leaves, coal, honey, wax etc. The wood is mainly used for fuel purposes and tendu leaves are used for manufacture in Bidi industries. Coal is marketed through commercial agencies.

On the basis of studies done and relevant surveys conducted it reveals that their is a potential for the new industries to set up and grow at Kota. The strength of the town considering the Kota district as a whole are its human resources, large livestock

population, non -metallic mineral resources(sand stone, masonry stone, lime stone), agricultural produce and above all enormous availability of power and water etc. Moreover, large number of concessions, facilities and incentives have been declared by the State Government for upgradation of industrialisation in this region. Further, a very efficient institutional set up is available within the district as it is the regional headquarter. These all factors can be exploited by adopting a suitable strategy and suggesting the potential industries so as to optimally utilise the resources.

4.5 SUGGESTED POTENTIAL INDUSTRIES

The Kota district as a whole provide very good agricultural, livestock and non-metallic mineral resources. the district is not so rich in forest resources. These resources though have been discussed at district level but they are the boosting factors for the industrial growth in the town. Further survey reveals that there is a growing trend of industries and it has a potential to develop more industries.

Taking into consideration the human resources, material resources, mineral resources, forest resources and livestock resources, the type of industries which can be set up can broadly be divided in three groups viz. demand based, resource based and artisan industries. The industries suggested are discussed below:

4.5.1 Demand Based Industries

These industries include lime kiln, forging unit, rayon thread, portland cement plants, paints, steel furniture, prefabricated construction units, ready made garments (export oriented), agricultural implements, automobile repair shop, engineering fabrication units, tyre retrading, detergent soap and power, air pollution control equipments, P.V.C. chappals and rubber moulded items, soyabeen products and thermocol packing etc.

4.5.2 Resource Based Industries

Stone cutting and polishing, marble cutting and polishing, leather shoes, coriander and processed spices, fish meal, fish processing, bidi udyog etc.

4.5.3 Cottage and Artisan Industries

The major artisan industries are leather works, dona pattal, wooden toys, handloom, sarkanda and khas udyog, broom udyog, wood work etc.

A study was done by D.I.C.,Kota in 1993-94 about the potential industries in the above suggested areas. This study estimates the potential to develop about 150 additional units which will call for an investment about Rs.8000 lakhs. These industries are supposed to generate about 3200 employment opportunities upto March, 1997.

This industrial development would call for other supporting facilities in the form of road connections, general education, technical education, medical facilities, animal husbandry facilities, irrigation system improvements for enhancing agricultural production etc. In the subsequent chapters a planning strategy is proposed so as to carry out these improvements to achieve a balanced and compact urban structure.

Chapter-5

DEMOGRAPHIC PATTERN OF KOTA

Since industrialisation took impetus after the construction of Kota barrage on river Chambal, vast human agglomiration occured at Kota. This was due to the better infrastructure(e.g.availability of land, water supply, electricity etc.) of the city as well.

The population growth trend in the city since 1901 A.D. census which is discussed under 3.2.5 is shown in the table below :

TABLE 5.1

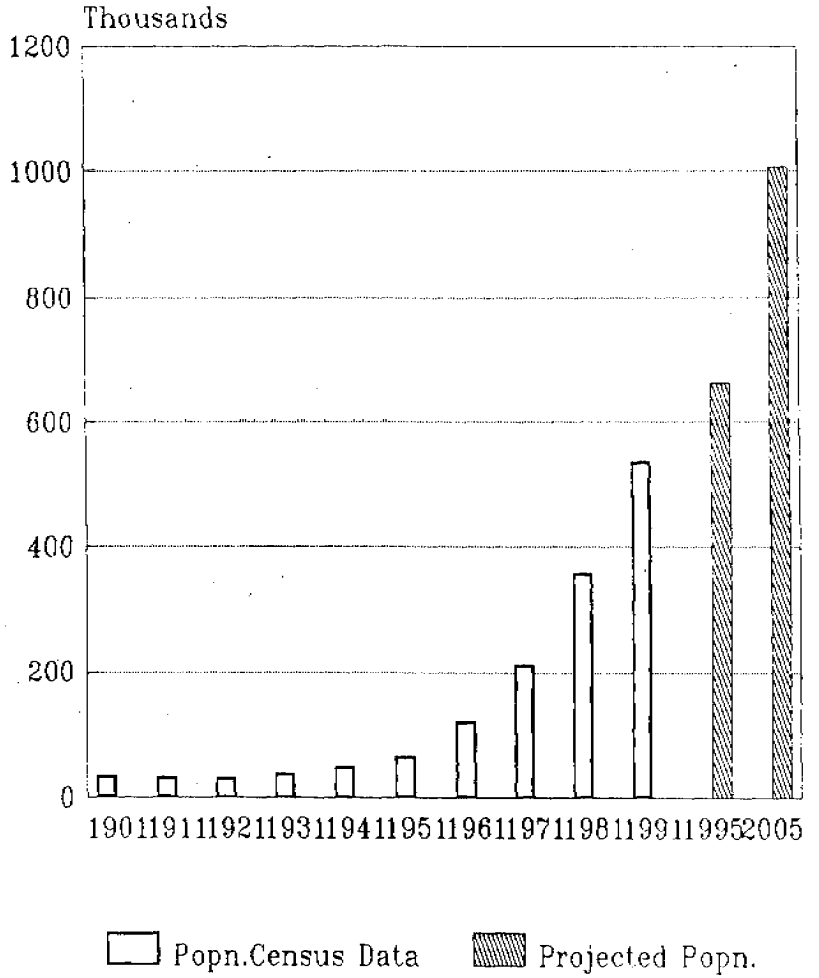
POPULATION GROWTH TREND IN KOTA CITY

Year of Census	Total Population	Decadial Variation	%age Decadial Variation
1901	33657	-	-
1911	32753	-904	-2.70
1921	31707	-1046	-3.40
1931	37876	+6169	+19.50
1941	47339	9463	+25.00
1951	65107	17768	+37.80
1961	120345	55236	+84.80
1971	212991	92646	+76.99
1981	358241	143250	+68.20
	[366000]*		
1991	537371	179130	+50.00
	[550000]*		

* As estimated in Master Plan (1971-91)for Kota.

* Source: District Census Handbook (1991),Kota.

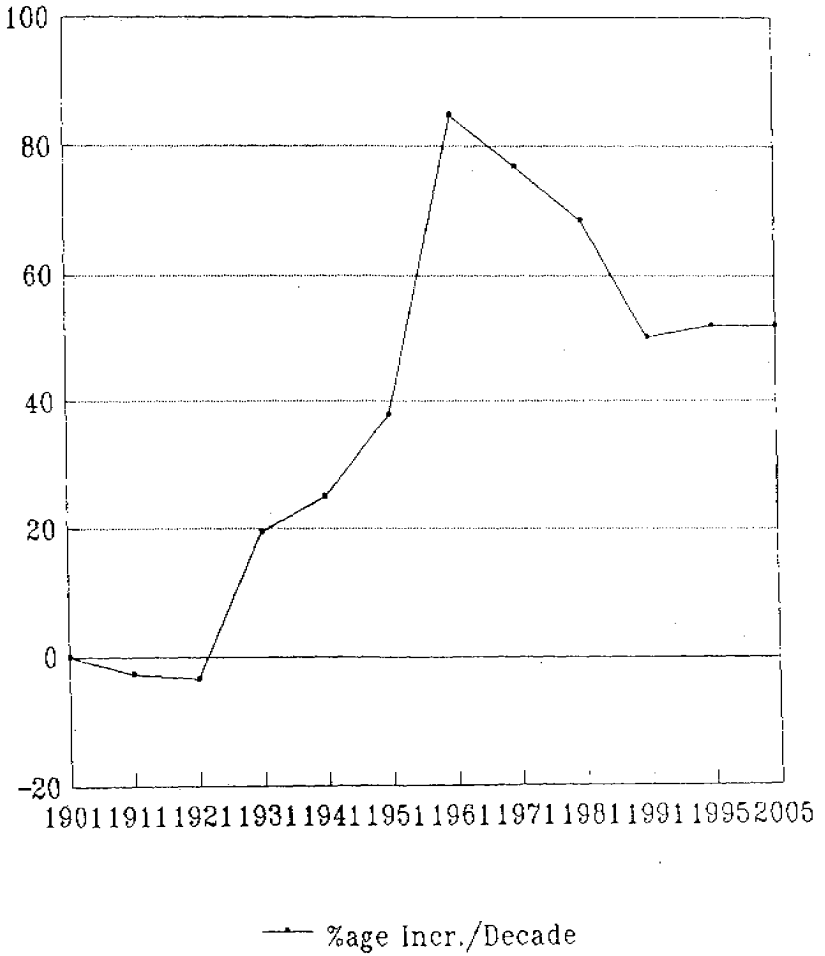
POPULATION GROWTH TREND IN KOTA CITY.



Source:Distt. Census Handbook,1991.

POPULATION GROWTH TREND IN KOTA CITY.

(%age Decadial Variation)



Source:Distt. Census Handbook,1991.

The above population growth trend in Kota city is also shown in illustrations.

5.1 POPULATION GROWTH TREND IN ADJOINING DISTRICTS

Population growth rates since 1951 in the Kota district and its adjoining districts have been shown in the following table:

TABLE 5.2

POPULATION GROWTH TREND IN KOTA DISTRICT AND ADJOINING DISTRICT

DECADE	KOTA	BUNDI	JHALAWAR
1951 -61	26.52	20.92	21.44
1961 -71	35.04	32.42	26.81
1971 -81	36.62	30.83	25.85
1981 -91	32.10	25.51	21.00

*Source: District Census Handbook (1991),Kota.

This shows that since last four decades the growth rate in Kota district has been continuously more than that of Bundi and Jhalawar district . This can be interpreted in terms of migration of people from the adjoining areas into Kota . Further there is no urban centre having population one lakh within these three districts except Kota . This further reflects that there is no other employment centre within the boundaries of these 3 districts . This trend can be regarded as detrimental for the balanced growth of the region and to regulate and control the migration of rural population into the city.

5.2 POPULATION GROWTH TREND IN TOWNS OF THE DISTRICT

Kota district was established as district in 1948 . It was merged in ''Great Rajasthan' (VRIHAT RAJASTHAN) in the year 1949. On 11 April ,1991 Baran district was seperated from Kota district.

Area of District before separation = 12723.28 Sq. Km

Area of Kota district after separation = 5767.97 sq. Km

Area of separated Baran district = 6955.31 sq. Km

In 1991 census the Baran district was not counted as separated and the integrated Kota district was having 8 major towns. The population growth trend in these towns of the districts has been as follows:

TABLE 5.3

POPULATION GROWTH TREND IN TOWNS OF KOTA DISTT.

Year	Anta	Baran	Chhabra	Chippa Barod	Kaithun	Kota	Mangrol	Ramganj Mandi
1901	-	7892	6752	-	-	33657	-	-
1911	-	9505 (+20.4)	6164 (-8.3)	-	-	32753 (-2.6)	-	-
1921	-	10157 (+6.84)	5251 (-14.8)	-	-	31707 (-3.2)	-	-
1931	-	11471 (12.92)	5462 (+4.2)	-	-	37876 (+19.1)	-	-
1941	-	14087 (+22.6)	6107 (+11.8)	-	-	47339 (+24.9)	-	-
1951	-	20419 (+44.9)	6537 (+7.0)	-	2320	65107 (+37.5)	-	5111
1961	-	22764 (+11.48)	7553 (+15.6)	-	2608 (+12.4)	120345 (+84.4)	-	6805 (+33.1)
1971	-	29806 (+30.95)	9707 (+26.4)	8704 -	2655 (+1.8)	212991 (+76.9)	-	11185 (+64.3)
1981	10936	42000	12262	10468	4157	358241	12856	15530
	-	(+40.9)	(+25.3)	(+20.2)	(+56.5)	(+68.2)	-	(+30.8)
1991	18526	57719	16384	13489	16040	537371	16957	20875
	(+69.4)	(+37.4)	(+33.6)	(+28.8)	(+285.8)	(+50.0)	(+31.8)	(+34.4)

* Source: District Census Handbook (1991),Kota.

The above table shows that all the other towns in the district have shown lesser growth rate as compared to Kota . The only town 'Kaithun' and 'Anta' have shown greater growth rates . But these are in there initial emerging state as they have been included as towns in census 1981 for the very first time. Kaithun has shown this growth because during last two decades it has emerged as the manufacturing centre for Kota Doria / Masuria sarees , on the other hand Anta could grow because of set up of N.T.P.C. plant .

Total population of towns = 713049

Total population of Kota = 537,371 (75.3%)

Total population of remaining areas = 175,678 (24.7%)

As we can see from the above statistics that rest of towns share a very less portion of population . Hence, it is very clear that the population increase in these towns is very less as compared to Kota. Further, it also reflects that there is no other intermediate urban structure which could trap the population flows towards Kota . Anta and Kaithun have shown that if these towns are developed as employment centre, they may arrest some population load.

5.3 OTHER DEMOGRAPHIC PARAMETERS

(A) SEX RATIO

The following table shows number of female per 1000 male during last four census.

TABLE 5.4
SEX RATIO TREND

census year	1961	1971	1981	1991
Sex ratio	872	816	836	865

*Source : District Census Handbook (1991), Kota.

The above figures show that there was abrupt fall in sex-ratio in the town from 1961 to 1971. This may be because of in-migration of single male population into the town. This is showing an increasing trend which would be either due to the marriages of single bachelors or due to the shifting of families of the single married men who came during the preceeding decades.

(B) LITERACY RATE

The following table shows the literacy rate in the town:

TABLE 5.5

TREND OF LITERACY

census year	total population	Literate population	%age literacy
1971	212991	103798	48.73
1981	358241	200875	56.07
1991	537371	323218	60.15

* Source : District Census Handbook (1991), Kota.

Literacy rate in the town is steadily increasing which can be understood in terms of generation of skilled man-power in the town. Availability of skilled man-power may be the reason behind diminishing growth rate of the town.

(C) DENSITY

The following table shows the decadial growth rate of density of town

TABLE 5.6

DENSITY TREND

census year	1971	1981	1991
Density	1501	1618	2248

* Source : District Census Handbook (1991), Kota.

The above figures reflect the increasing congestion in the town.

(D) SC/ST POPULATION

TABLE 5.7

SC/ST POPULATION

year	total popu.	SC popu.		ST popu.	
		Nos.	%age	Nos.	%age
1971	212991	28876	13.56 %	4620	2.17 %
1981	358241	50250	14.03 %	11105	3.1 %
1991	537371	88482	16.46 %	17021	3.17 %

*Source : District Census Handbook (1991), Kota.

(E) NO. OF HOUSEHOLDS

TABLE 5.8

NUMBER OF OCCUPIED HOUSES AND HOUSEHOLDS

census year	No. of occupied Residential Houses	Increase in Nos.	%age increase	no.of households	Increase in Nos.	%age increase
1971	42388	-	-	45026	-	-
1981	66886	24498	54.51 %	68473	23447	52.17 %
1991	97593	30707	45.90 %	101783	33310	48.65 %

*Source : District Census Handbook (1991), Kota.

The above statistics show that during the decade 1971 to 1981 increase in number of occupied houses was less than the increase in number of households. This may be because of the low rent paying capacity of industrial labourers. This also gave rise to development of Katchi Basties (slums). During 1981 and 1991 increase in number of houses was less than the number of households which reflects the upcoming of trend of rented houses.

Further, it can also be interpreted as the improvement in the economic condition of the labourers as the Katchi Basties identified in 1991 census were 31 against 62 in 1981 census. Still there is an acute housing shortage in the town.

5.4 OCCUPATIONAL STRUCTURE:

The statement below gives the occupational structure of Kota city during last four census years.

TABLE 5.9
OCCUPATIONAL STRUCTURE AND WORKER'S DISTRIBUTION

S.No.	Description	1961	1971	1981	1991
1.	Total population	1,20,345	212,991	358241	537371
2.	Total main workers	40014 [33.25]	63701 [29.91]	102582 [28.63]	149976 [27.90]
3.	Cultivators	-	-	2106 (2.05)	3384 (2.26)
4.	Agricultural labourers	1739 (4.3)	2784 (4.37)	1572 (1.53)	3561 (2.37)
5.	Mfrg.,repair, Processing in H.H. Industry	1128 (2.82)	1936 (3.04)	4002 (3.90)	879 (0.59)
6.	Mfrg.,repair, Processing other than H.H. Industry	4749 (11.87)	16014 (25.14)		35194 (23.47)

Contd...

S.No.	Description	1961	1971	1981	1991
7.	Minning & Quarrying	-	296 (0.46)		1302 (0.87)
8.	Live stock, Forestry Fishing	894 (2.23)	465 (0.73)	94903 (94.57)	2996 (2.00)
9.	Construction	4265 (10.66)	3511 (5.51)		12886 (8.59)
10.	Trade & Commerce	5861 (14.65)	10197 (16.00)		29769 (19.85)
11.	Other serviees	15232 (38.07)	18464 (28.98)		45023 (30.02)
12.	Marginal Worker	- -	- -	752 [0.21]	2850 [0.53]
13.	Non Worker	80331 [66.75]	149290 [70.09]	254907 [71.16]	384645 [71.58]

[ ] %age of total population

( ) %age of main workers

* Source : District Census Handbooks, Kota.

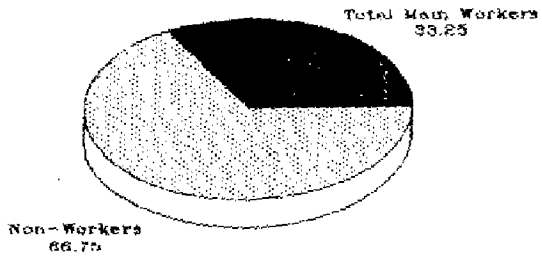
This table reflects that there has been a very little decrease in the industrial worker's population. This is due to the mechanisation and computerisation in the industrial setups which resulted in the less requirement of workers.

On the other hand the worker's population engaged in trade and commerce is showing increasing trend. This is due to the fact that about one third of the workers engaged in trade and commerce are directly linked with industries as their wholesale dealers and distributers. Though the industrials worker's population is not showing increasing rate but their allied distributive activities are increasing.

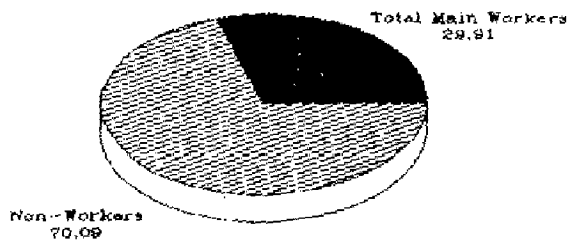
The occupational distribution and worker's distribution in Kota city are shown in illustrations.

OCCUPATIONAL STRUCTURE

KOTA CITY



1961

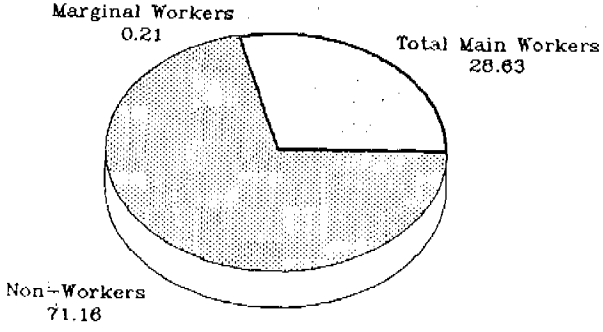


1971

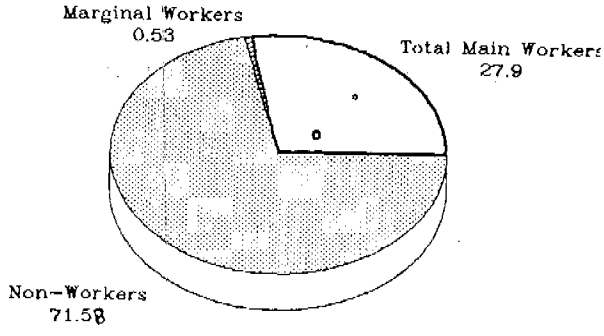
Source:District Census Handbook,Kota

OCCUPATIONAL STRUCTURE

KOTA CITY



1981

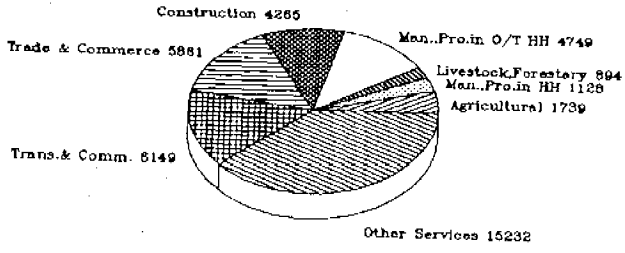


1991

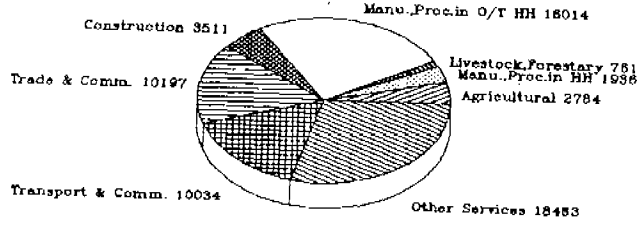
Source:District Census Handbook,Kota

WORKERS DISTRIBUTION

KOTA CITY



1961

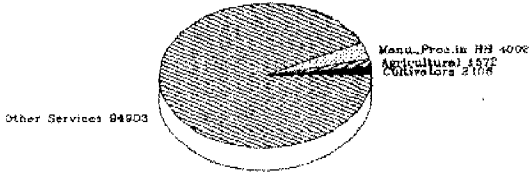


1971

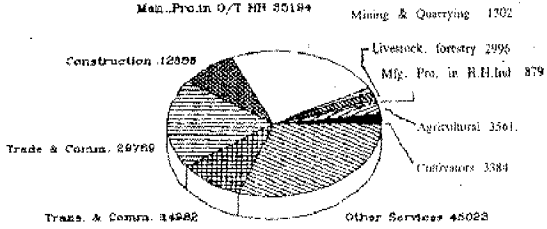
Source:District Census Handbooks,Kota

WORKERS DISTRIBUTION

KOTA CITY



1981



1991

Source:District Census Handbooks,Kota

Following table gives a comparative analysis of demographic characteristics of Kota town in relation to the district, state and the country as per the 1991 primary census abstract.

TABLE 5.10

COMPARATIVE OCCUPATIONAL STRUCTURE

INDICATORS	UNIT	INDIA	RAJ	DISTT. KOTA	KOTA CITY
1. Density	No.of persons per sq. km.	276	129	235	2248
2. Sex Ratio	Female per 1000 male	927	910	880	875
3. S.C.Population	% of total	16.33	17.29	20.27	16.46
4. S.T.Population	-do-	8.01	12.44	9.60	3.17
5. Literacy	-do-	42.45	30.79	44.48	60.15
6. Total workers	-do-	33.78	31.62	30.30	27.90
7. Cultivators	% of workers	38.72	58.80	28.47	2.26
8. Agricultural labour	-do-	26.09	10.00	12.92	2.37
9. Livestock forestry	-do-	2.11	1.80	2.40	2.00
10. Mining and quarrying	-do-	0.61	1.03	5.44	0.87
11. Mfrg. repair processing in H.H.Ind.	-do-	2.38	2.00	1.25	0.59
12. Mrfg. repair processing other than H.H.Ind.	-do-	7.65	5.45	12.16	23.45
13. Construction works	-do-	3.34	2.42	4.64	8.60
14. Trade and Commerce	-do-	7.45	6.41	11.22	19.85
15. Transport	-do-	2.80	2.39	4.88	9.99
16. Other services	-do-	10.25	9.69	16.61	30.02
17. Marginal worker	% of total population.	3.33	7.25	3.74	0.53
18. Non workers	-do-	62.41	61.13	65.96	71.57
19. Rural population	-do-	74.29	77.12	49.47	-

*Source:Primary Census Abstract(1991).

Calculations for Supporting Population

Increase in industrial activities results in population concentration. This also calls for allied activities which can be termed as supporting activities. Population engaged in these activities are called as supporting population whcih can be counted as following:

1. Livestock, forestry, fishing, hunting etc.
2. Construction
3. Trade and Commerce.
4. Transportation, storage and communication.
5. Other services.

Particulars	India	Rajasthan	Kota Distt.	Kota City
Industrial workers (%age of total main workers)	10.03	7.45	13.41	24.04
Supporting populations (%age of total main workers)	25.95	22.71	39.75	70.46
Ratio of supporting population to Industrial workers	2.59	3.05	2.96	2.93

The above table shows that the ratio of supporting population to industrial workers in Kota city is 2.93. Hence, 1000 industrial workers will add 2930 supproting workers. This total increase of 3930 in workers population will cause about 20,000 increase in total population.

5.5 POPULATION PROJECTIONS

In order to predict the future population as correctly as possible, it is necessary to chose the best suitable method of forecasting, out of various methods which are generally adopted for estimating future populations. These all methods are based on the laws of probability. The generally used methods are:

(a) Arithmatic Increase Method

This method is useful for smaller design periods or for old and very large cities with no industries and which have practically reached their maximum development.

(b) Geometrical Increase method:

This method is suitable for a young city which is at present expanding at faster rate.

(c) Incremental Increase method:

This method is a combination of the above two methods and gives the values in between the above two methods.

The population growth in kota can be seen to have positive trend only after 1921 census year. Hence to take census 1921 as the base year.

Year	Total pop.	Decadial variation	% increment
1921	31,207	-	-
1931	37,876	6,169	19.5
1941	65,107	17,768	37.80%
1951	1,20,345	55,236	84.8%
1961	2,12,991	92,648	76.99%
1971	3,58,241	1,45,250	68.20%
1981	5,37,371	1,79,130	50.0%

As we can see the growth rate during last 5 decades has been showing a diminishing trend but due the fact of very high growth rates,the geometrical

increase method is taken as the forecasting method.

Projections:

(i) The Average % increase in population = 51.821

(ii) Population in 2001 A.D. $= 5,37371\ [1+ 51.82/100]^{10}$

$= 815842 = 8,16,000$

(iii) Annual growth rate in the decade 1991-2001

$i = (Pn/P_o)^{1/n} - 1\} 100\%$

$= (816000/537371)^{1/10} - 1\} 100\%$

$= 4.27\%$

(iv) Population at the end of 1995 $= 537371\ (1.0427)^5$

$= 6,65,000$ persons.

(v) Population for 2005 A.D.

$P_{2005} = 8,16,000\ (1.0427)^5$

$= 10,06,000$

(vi) Worker's population increase per 1000 industrial workers.

= Supporting workers + Industrial Workers

= 2,930+1,000

= 3,930

(vii) Total population increase @ the rate of 5 members per household

= 3,930x5

= 19,650 ≈ 20,000

Chapter - 6

CAUSES OF EVOLUTION OF PRESENT URBAN STRUCTURE & AREAS OF CONFLICTS AND COMPATIBILITY

6.1 PRESENT URBAN STRUCTURE AND CAUSES OF ITS EVOLUTION

It took a period of about seven centuries for evolution of Kota town as an industrial city from a small basti inhabited by Btill tribes.The existing land use of Kota town in the years 1971, 1981 and 1991 are shown in the illustrations.

6.1.1 Primary Causes behind the Eemergence of Kota as a Town

1. Presence of a perennial river Chambal in the immediate vicinity of the town.
2. Availability of cultivable agricultural land which has good fertility.
3. Availability of rocky Barren land for the growth of the town.
4. Locational importance of the town in regional setting.

6.1.2 Causes behind Growth of Industries before 1960

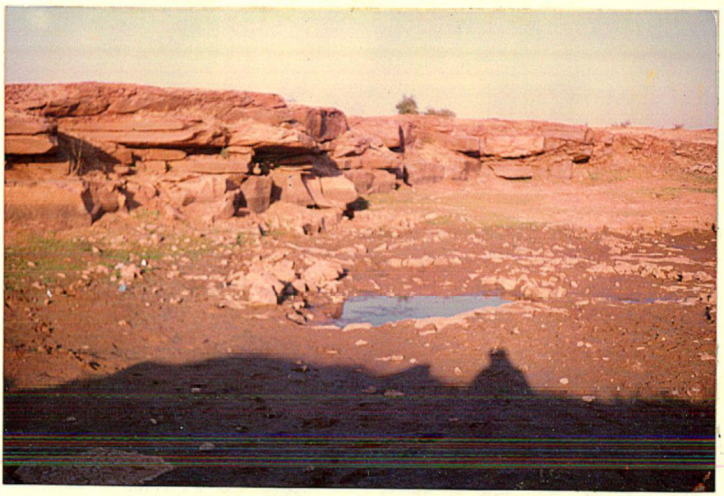
1. Location of the town on the bank of river Chambal.
2. Availability of mineral resources,forest resources, lirestock resources,etc.
3. Availability of cultivable agriculture land and hence agricultural resources.
4. Settling of Sindhi Refugees from East Pakistan around 1947, as a result of country's partition. This community gave impetus to industrial growth specially Bidi manufacturing to startwith.

6.1.3 Causes behind Growth of Industries after 1960

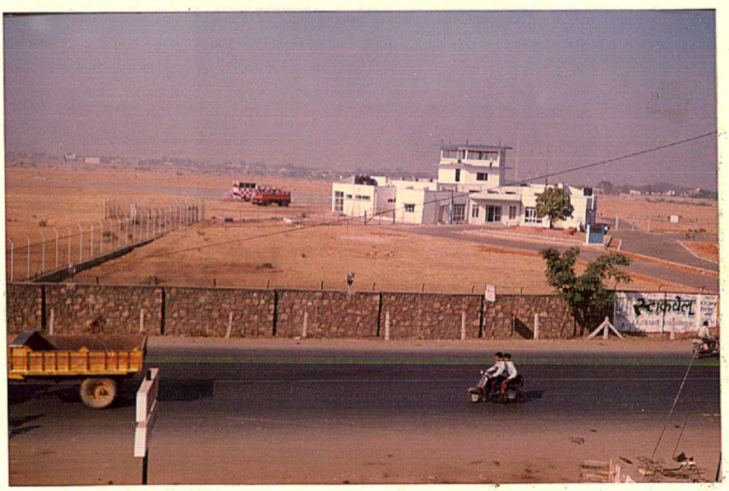
1. Good surface transportation linkages through road as well as railways due to its location on the Delhi-Bombay main Railway line and National Highway no. 12 passing through it.
2. Availability of abundant water supply, due to the large reservoir created by the construction of Kota Barrage.
3. Availability of abundant power supply as the power plants (refer ...) came in operation.
4. Availability of barren & rocky land for industrial set-ups.
5. Locational suitability of the land from the point of view of prevailing wind direction.
6. natural slope of the area catering to easy drainage.
7. Regional linkages of the town with the surrounding hinterland
8. Government policy to boost industrialisation by providing subsidies, incentives, facilities, intrastucture, loan facilities etc.
9. Availability of raw material.
10. Easily available local skilled and unskilled labour.
11. Availability of potential to market finished industrial products within the state as well as all over India.

As a consequence of enormous Industrial growth there has been vast concentration of population at a very high growth rate. Hence, physical growth of the town took place which gave rise to expansion of the within place activities (e.g. Industrial, Commerical, recreation and residential). Due to this 'Between place' activities (e.g. flow of money, goods, people and information) also increased. Because of these facts on the basis of 'Myrdal's principle of circular and cumulative causation', there had been a multiplier effect which kept on changing the structure of the town in terms of

ESTABLISHMENTS

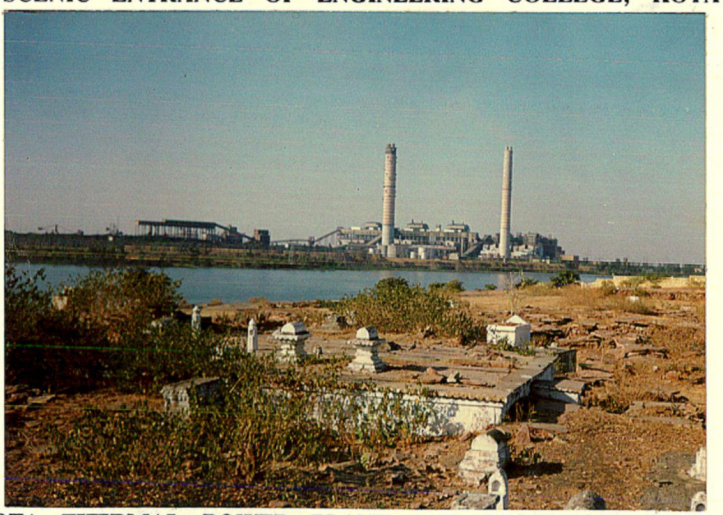


1. STRATA OF THE ROCKEY AND BARREN LAND IN SOUTHWARD DIRECTION.



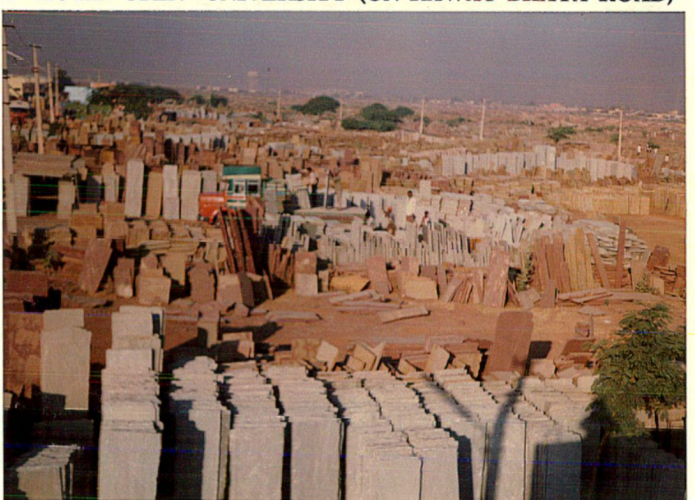
2. KOTA AIRPORT (ON N.H.12)

3. SCENIC ENTRANCE OF ENGINEERING COLLEGE, KOTA

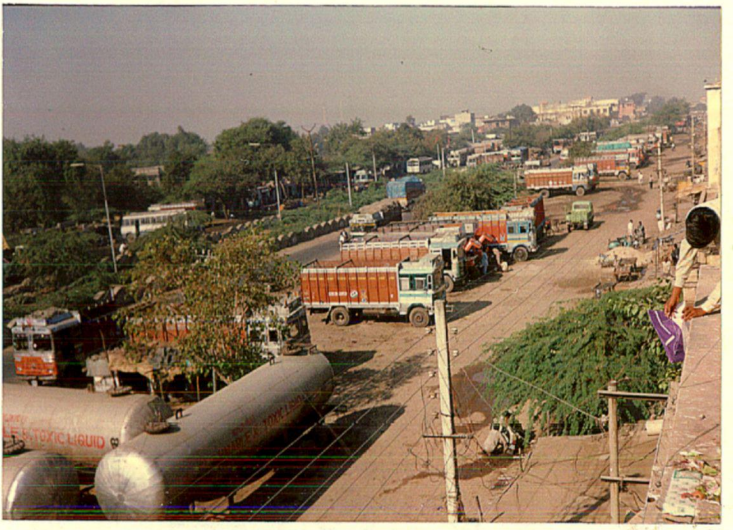


4. KOTA THERMAL POWER PLANT AND RESERVOIR CREATED BY THE BARRAGE ON RIVER CHAMBAL.

5. KOTA OPEN UNIVERSITY (ON RAWAT BHATA ROAD)



6. STONE MANDI KOTA (ON NH 12)



7. PRESENT TRANSPORT NAGAR

(NEAR AERODROME CHAURAHA)

8. REHABILITATION RESIDENTIAL COLONY FOR SLUMS KNOWN AS VEER SAVARKER NAGAR. (ON RANGBARI ROAD)

regularly imposed increasing demands for 'Adapted spaces' and 'Channel spaces' to accommodate the pace of growth of the town.

6.1.4 Industrialisation and Urban structure inter relationships

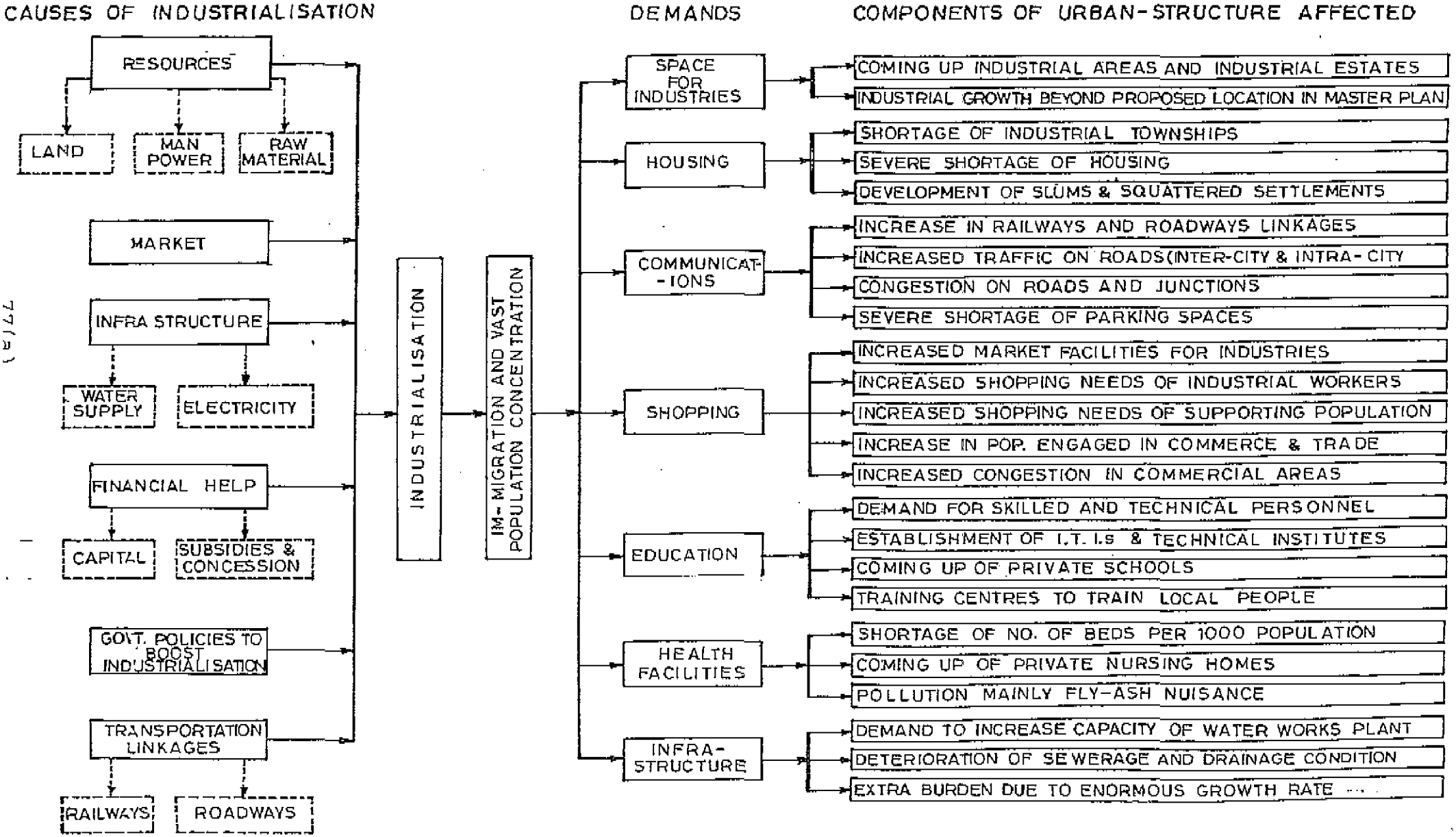
Impact of industrialisation on urban structure can be understood from the inter-relationship shown in the block diagram .

6.1.5 Structure of Kota

(A) BEFORE 1960 AD

Upto 1960 A.D. the development of the town was limited within the boundaries of the fortified area. In the 18th century town has started expanding outside the walled city. Upto 1900 A.D. it could expand in the areas Chhawni in the East and Ummed Bhawan area towards north of Chhattar Bilas tank. During the period from 1901 to1947 city expanded mainly in the North direction and the areas of Nayapura and Kherli were inhabited. Specifically this was the time of start of urbanisation of the town. During this period Railway line had come up and Railway station was constructed. Due to this town expanded from Kherli to Railway station area. Construction of aerodrome was commenced. College and City High School were established alongwith other small establishments. Town also expanded on the other side of the Chambal river and two small settlements Kunhari and Sakatpura had come up. Further, a large area had been acquired to develop the military cantonment. The town had emerged as an important educational centre and awareness for education in the region was realised by the inhabitants. Subsequently, during this period a number of refugees from East Pakistan moved into Kota as a result of country's partition. These were mainly Sindhies. Because of their awareness towards business and trade and thier skill gave rise to development of the cottage industries in the walled city, chhawni and Nayapura areas. The areas of Gumanpura, Kishorpura were inhabited by them. This was the initial phase

IMPACT OF INDUSTRIALISATION ON URBAN STRUCTURE IN KOTA
'CAUSE-EFFECT RELATIONSHIPS'



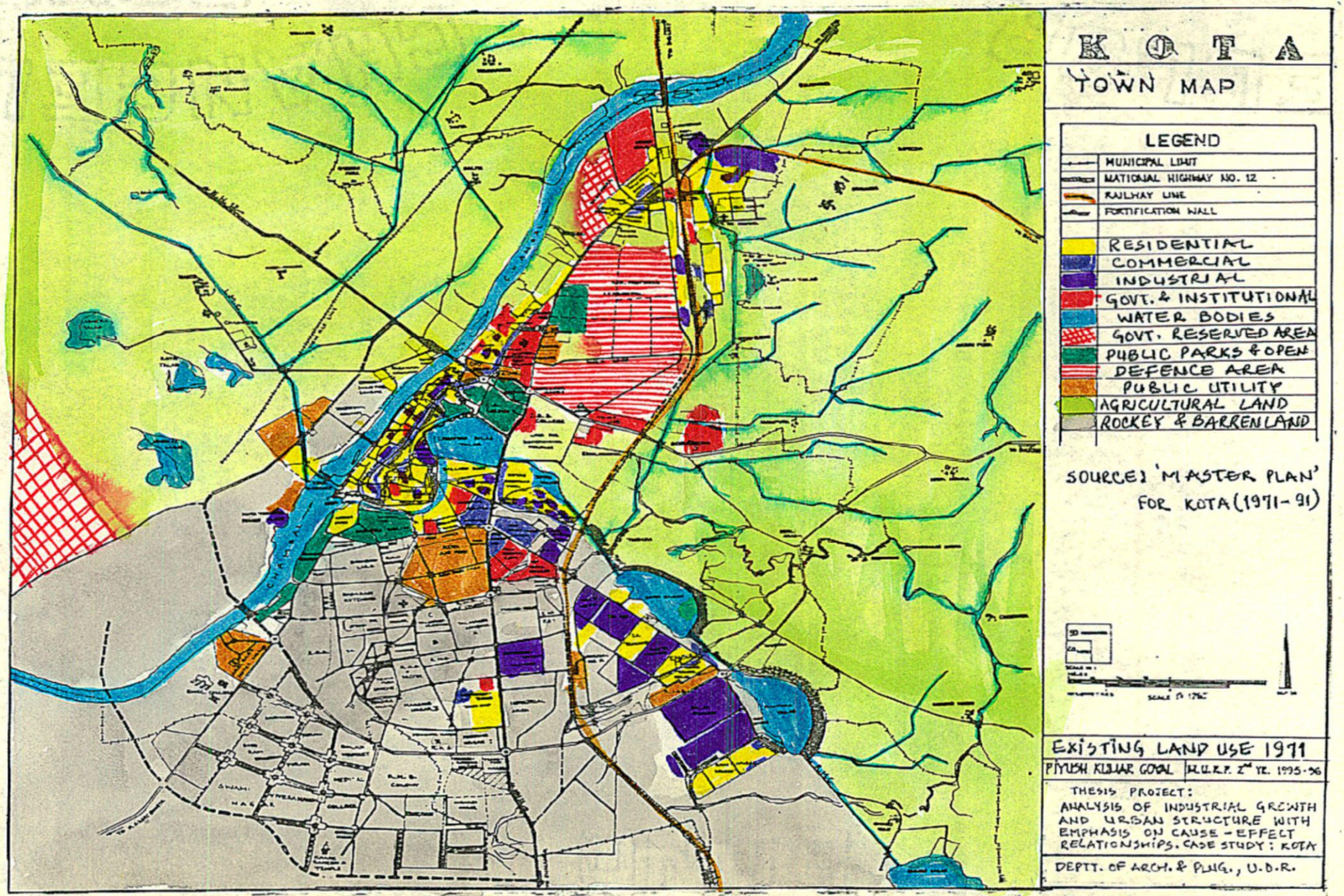
of the industrialisation in the town and it emerged as a centre for trade and commerce also. During the decade 1951-61 the population growth rate was maximum i.e. 84.8%.

By this time the water supply was from water purification plant at Akelgarh (On Rawatbhata road) which was established in 1927 A.D.The water level then in the river Chambal was very low.. Hence, the water was being pumped to purification plant (which had Slow-sand Filter technique) from a well dug in the river bed to collect water from the river.Kota thermal power Plant had also started working since 1926 and hence power was also being generated.

(B) FROM 1960 A.D. TO 1975 A.D.

After 1960, the change in the urban structure was so abrupt as it can be termed as a miracle. This could happen becuase of construction of Chambal project i.e. construciton of Gandhi Sagar Dam in Madhya Pradesh and Jawahar Sagar Dam and Kota Barrage in Kota district.Further, two more hydel plants were established in the region.Two irrigation Canals generating from the reservoir on each bank of the Chambal river were also constructed. These activities attracted a number of workers who got engaged in construction works. Later on These workers settled here and caused enormous population growth.These canals and their tributaries facilitate good irrigation througout the region through a wide spread network. These irrigation facilities enhanced the agricultural productivity from all over the command area. Agricultural resources were enhanced and strengthened the economic base of the town. Power generation was also increased. Akelgarh water works introduced Rapid- sand filteration technique and increased its capacity to produce filtered water.Due to the strengtheing of infrastrucural facilities and good linkages around Kota,it has started attracting industries.

Government policies were also catalytic factors as discussed in the preceeding chapters. This industrial growth attracted a large population from rural areas and from the urban areas of Rajasthan and other states so as to meet the demands of


K O T A
TOWN MAP
LEGEND
MUNICIPAL LIMIT
NATIONAL HIGHWAY NO. 12
RAILWAY LINE
FORTIFICATION WALL
RESIDENTIAL
COMMERCIAL
INDUSTRIAL
GOVT. & INSTITUTIONAL
WATER BODIES
GOVT. RESERVED AREA
PUBLIC PARKS & OPEN
DEFENCE AREA
PUBLIC UTILITY
AGRICULTURAL LAND
ROCKEY & BARRENLAND
SOURCE: 'MASTER PLAN' FOR KOTA (1971-91)
EXISTING LAND USE 1971
PIYUSH KUMAR GOYAL
M.U.R.P. 2nd YR. 1995-96
THESIS PROJECT:
ANALYSIS OF INDUSTRIAL GROWTH AND URBAN STRUCTURE WITH EMPHASIS ON CAUSE-EFFECT RELATIONSHIPS. CASE STUDY: KOTA
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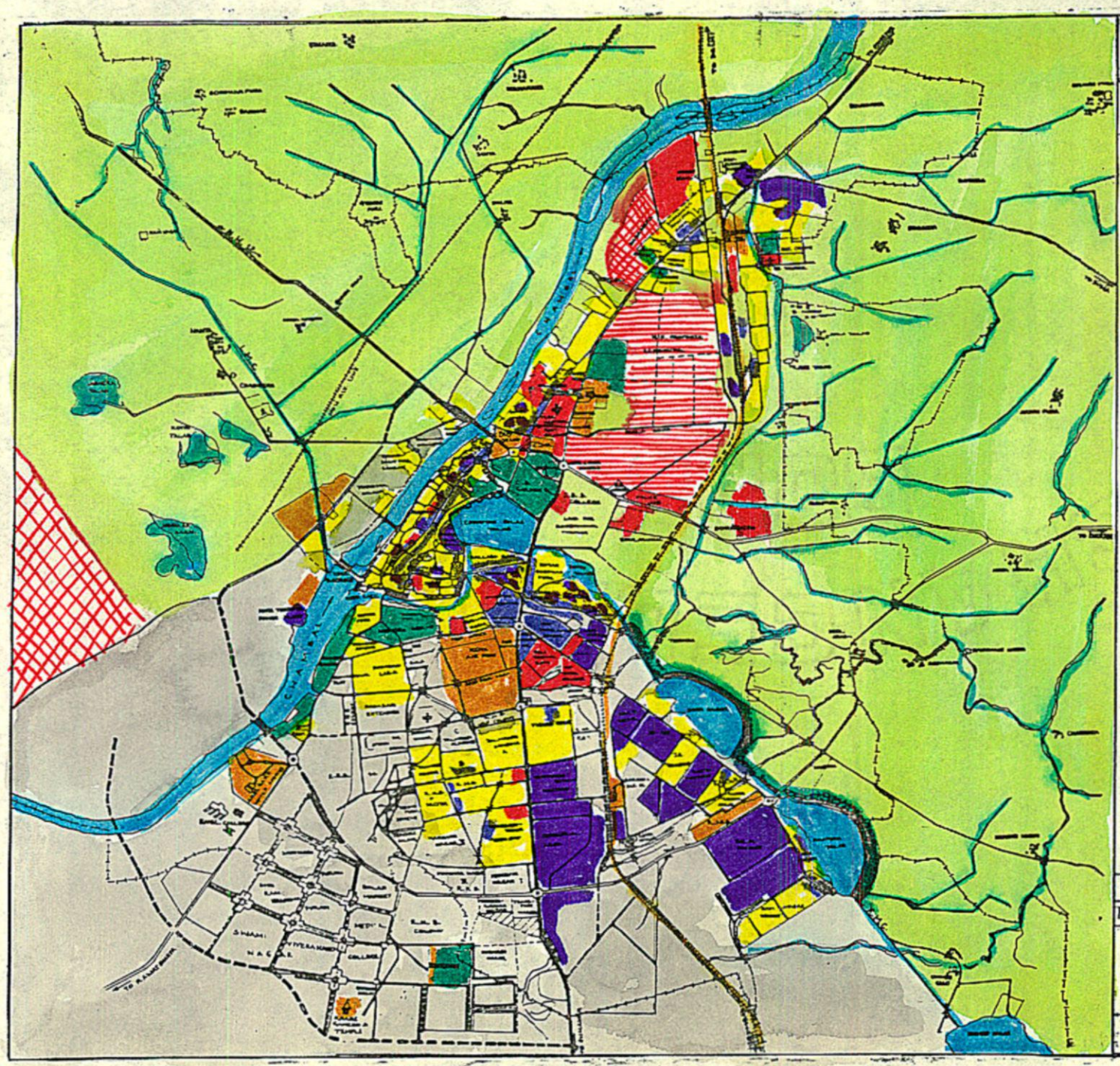
unskilled and skilled work force respectively. By this time the Central Business District (CBD) of the town was limited within the walled city. The industrial and natural growth congested the town which resulted in 77% decadial growth rate in the decade 1961-71. Agglomeration of the population to this much amplitude made administraters to wake-up and prepare some planning strategy for the imporvement in the conditions before they become severe.

In the year 1971, Urban Improvement Trust was constituted for Kota. A Master Plan to regularize the growth trend of the town was prepared as base year 1971 and horizon year 1991. This Master Plan came into force from 11th may, 1977.

(C) AFTER 1975 AD

In the Master Plan, it was proposed to have a new CBD in the areas Gumanpura, Shopping Centre and New Grain Mandi outside the walled city. It was to decongest the walled city. However, it could not decongest the walled city but provided additional commercial facilities to cater to the increased demands of growing population. Subsequently, this specialised the needs of day to day shopping. The fucntional category of the town became primarily industrial. Concept of industrial Areas and Industrial Eastates was implemented in the Master Plan so as to check the haphazard Growth of the town. Urban improvement Trust together with Rajasthan Housing Board prepared residential schemes. It was only after 1971 that a need was felt to establish regional headquarter instead of being administered from Jaipur. Kota became the divisional headquarter of Western Railways. Educational centres e.g. Commerce College ,Girls degree college and a Polytechnic College were also established. In the year 1981 an Engineering College was established in the town, which could have its own building and campus in the year 1988 near Akelgarh Water Works on Rawat Bhata Road.

During the period of 1981 to 1991 city expanded towards south. The growth of the town could not extend towards west and east due to the physical barriers, river Chambal to the West and Railway line to the East. This was around 1986 when an Open



K O T A

TOWN MAP

LEGEND	
	MUNICIPAL LIMIT
	NATIONAL HIGHWAY NO. 12
	RAILWAY LINE
	FORTIFICATION WALL
	RESIDENTIAL
	COMMERCIAL
	INDUSTRIAL
	GOVT. & INSTITUTIONAL
	WATER BODIES
	GOVT. RESERVED AREA
	PUBLIC PARKS & OPEN
	DEFENCE AREA
	PUBLIC UTILITY
	AGRICULTURAL LAND
	ROCKEY & BARREN LAND

SOURCE : TOWN PLANNING DEPTT. KOTA

SCALE 1" = 1760'

EXISTING LAND USE 1981

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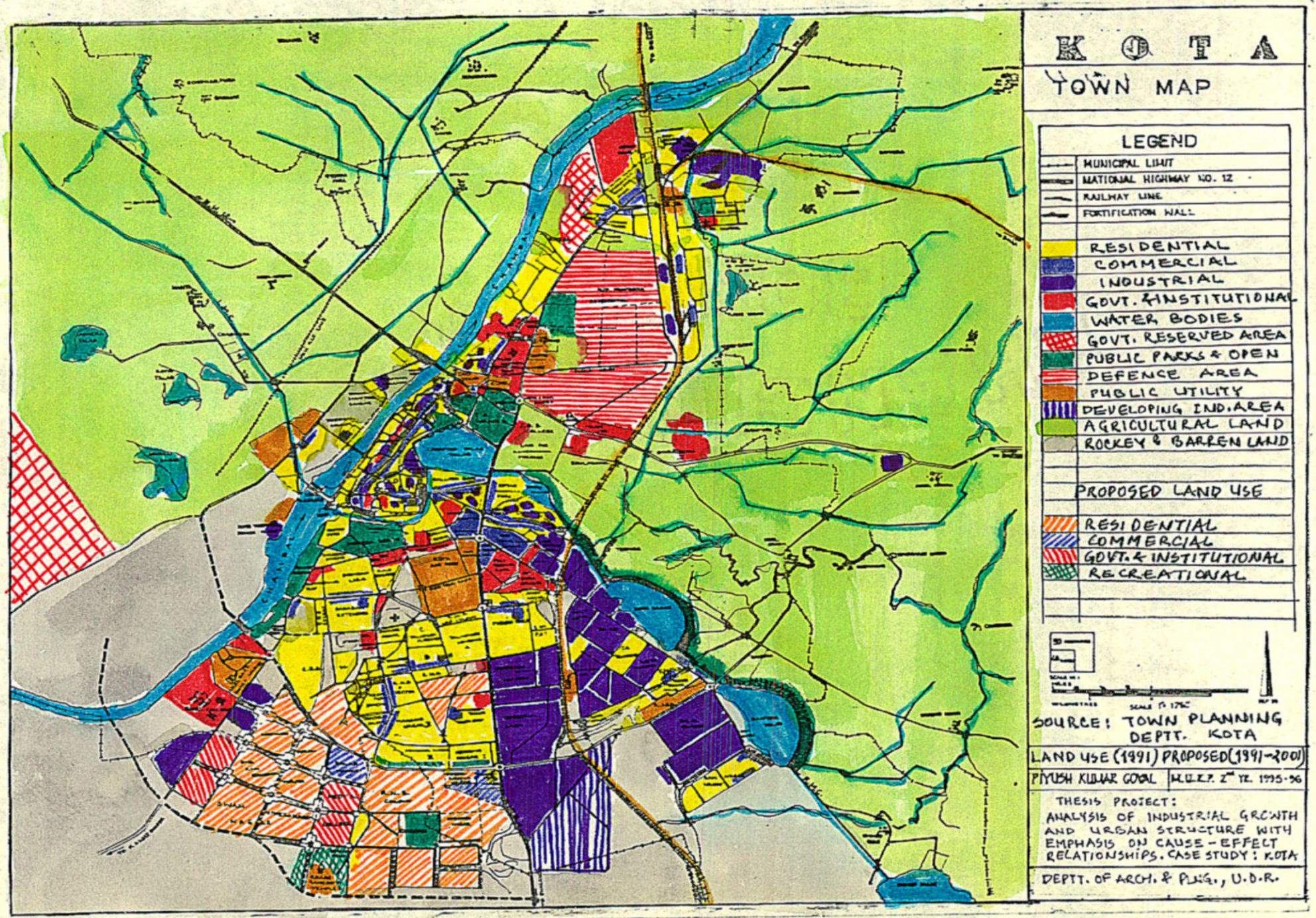
University was established. In the year 1992 a Medical college was also established. During 1981 to 1991 the city became more congested. Within the walled city streets were narrow which further became very congested because of the growing concentration of commercial activities. While the part of the NH 12 in the town i.e from Central Bus Stand to Anantpura (via AntaGhar Chauraha, Kotri Chauraha, Chhawai and Aerodrome Chauraha) has started congesting due to inter-city and intra-city traffic. Further, population density being maximum within the walled city is adding fuel to fire. Some more congested intersections have also been identified. A byepass to N.H. 12 had been proposed in the Master Plan from Anantpura to Bundi road across the Chambal to the West of the town. This was to facilitate the easy and speedy movement of vehicles on NH in addition to check the inter-city traffic entering the town. But becasue of the further growth of town in southward direction, the proposed residential areas for future extension have crossed the location of this bye-pass. Now it has been decided not to construct it so as to act as a byepass to NH, rather, this road (which connects NH to Rawat Bhata Road) will serve as a city road. The Master Plan (1971-91) for Kota has been made operative till 2000 AD by alloting extra land to Urban Improvement Trust towards southern direction. As per proposals for this future period an another byepass to NH 12 is proposed in the extreme south of the town which will cross the river Chambal to join Bundi road.

During 1960 to 1981 there was an acute shortage of housing. This was due to the fact that the physical development takes much time to match the demands imposed by the increasing population. Moreover, the economically weaker industrial labourers have lower rent paying capacity. This resulted into growth of slums and squattered settlements. In the 1981 census, 62 katchi basties (slums) were identified while in 1991 census, the identified katchi basties are 31. These basties are not located on the prime locations within the town as most of them are situated on the out skirt of the town. Out of these 31 identified katchi basties (as per 1991 census), 11 katchi


K O T A
TOWN MAP
LEGEND
MUNICIPAL LIMIT
NATIONAL HIGHWAY NO. 12
RAILWAY LINE
FORTIFICATION WALL
RESIDENTIAL
COMMERCIAL
INDUSTRIAL
GOVT. & INSTITUTIONAL
WATER BODIES
GOVT. RESERVED AREA
PUBLIC PARKS & OPEN
DEFENCE AREA
PUBLIC UTILITY
DEVELOPING IND. AREA
AGRICULTURAL LAND
ROCKEY & BARREN LAND
PROPOSED LAND USE
RESIDENTIAL
COMMERCIAL
GOVT. & INSTITUTIONAL
RECREATIONAL
SOURCE: TOWN PLANNING DEPTT. KOTA
LAND USE (1991) PROPOSED (1991-2001)
PIYUSH KUMAR GOEL
M.U.R.P. 2nd YR. 1995-96
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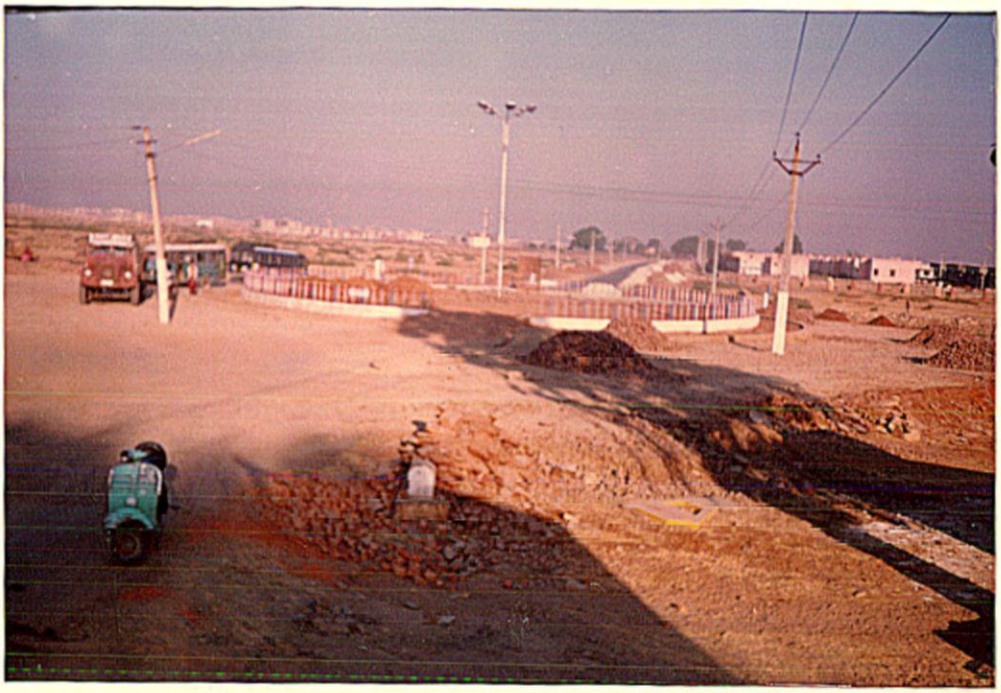
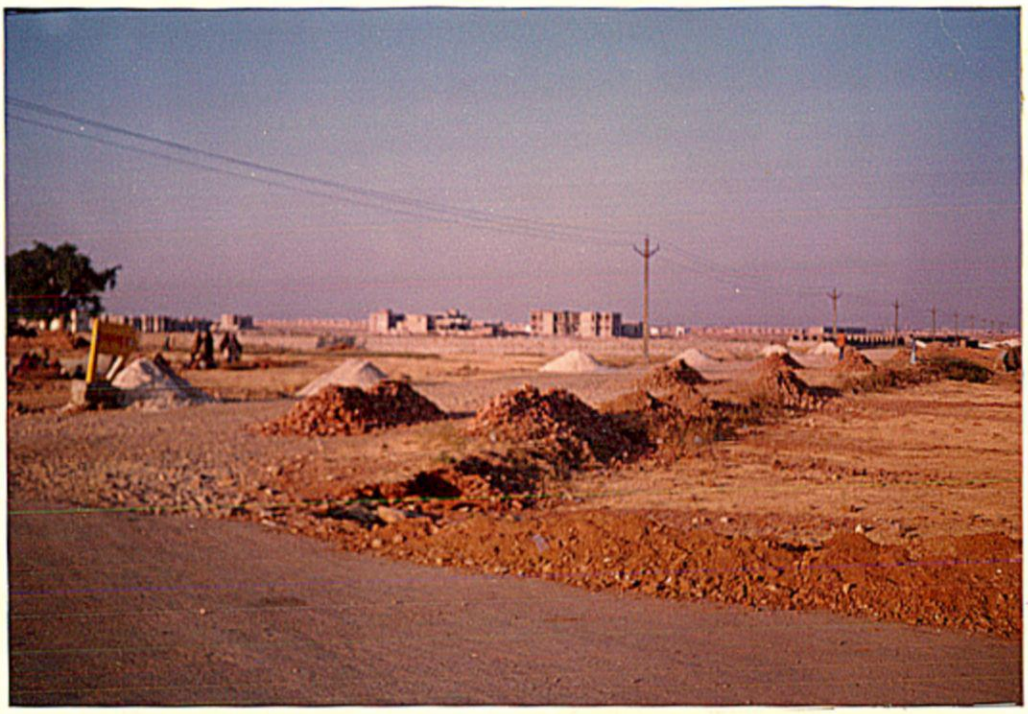
NEW DEVELOPMENTS



1. CONSTRUCTION OF ROUND ABOUT AND WIDEMING OF ROAD OPPOSITE TO RANGBARI.

2. MEDICAL COLLEGE CAMPUS AND ITS UNDER CONSTRUCTION BUILDING (ON RANGBARI ROAD).



3. RESIDENTIAL AREA 'SHRI RAM KRISHAN PURAM' BEING DEVELOPED (ON RANGBARI ROAD)

4. LAND FOR PROPOSED COMMERCIAL AREA NAMED AS BALAJI MARKET (ON RANGBARI ROAD)

basties are regularised so far. Recently, as per an announcement by the Chief Minister of Rajasthan all the katchi basties registered before 1991 will be regularised. Such political interference make planners helpless to implement Master Plan proposals and interrupt the planned expansion of town. For example, a katchi basti named as 'Gobaria Bawari' has encroached the land where the future Transport Nagar is proposed.

6.2 COMPONENTS OF URBAN STRUCTURE

6.2.1 Infrastructure

(A) POWER SUPPLY :-

There are three feeder G.S.S for power supply in Kota city these are :

(i) 132 KV G.S.S (Industrial Area).

(ii) 132 KV G.S.S (Mahaveer Nagar).

(iii) 220 KV G.S.S (Sakatpura).

The Average monthly consumption from these three G.S.S in about 575 lakh units per month. The power is generated by the four major power installation (refer Table No. 3.2) with total installed capacity of about 1951 M.W. Power is supplied throughout the southern Rajasthan from these power plants. Hence, power supply has not been any constraint for future growth.

(B) WATER SUPPLY :

At present the metered connections in the town are as follows:

TABLE 6.1

METERED WATER CONNECTIONS IN KOTA

Type	No of connections
Domestic	49680
Industrial	1470
Commercial	6919
Others	3350

* Source : P.H.E.D., Kota.

At present 1400 lakh litre filtered water is being supplied to the town

Particulars	1991	1995
(i) Total Population	537371	662325
(ii) Pop^{n} served by piped supply (95% of total)	510502	629210
(iii) Rate of water supply	275 lpcd	225 lpcd

Demand of water supply in future :

For an average Indian town per capita demand is 270 lpcd as per Indian standard recommendations. Hence, Additional requirement for 2005 A.D.

* Projected population	=	10,06,000
* Population served by piped supply (95%) of total	=	9,55,700
* Total water demand @ 270 lpcd	=	2580 lakh litre
* Additional requirement	=	1180 lakh litre
* Population increase per 1000 industrial workers increase	=	20,000
* Additional requirementof water @ 270 lpcd	=	20,000 x 270 = 54 lakh litre per day

Presently an additional filter unit of capacity 14 million gallon per day (mgpd) is being installed which will fulfil the demand for the coming decade.

Moreover, as per Master Plan the proposed residential commercial and institutional areas in the south of the town have elevation higher than that of the

water works plant. In these areas water supply may cause problems as some of the higher elevation areas e.g. Mahaveer Nagar (I, II, III & extension) Teachers Colony etc.are getting water supply for 10 to 14 hrs in a day.

(C) SEWERAGE AND DRAINAGE :

As discussed under 4.1.5(D), this is the most severe problem throughout the town. This condition will further deteriorate when there will be more pressure on infrastructure due to additional population. Moreover, there are a number of natural storm water drains passing through the town, which finally meet to rivulets or the tributaries of the river Chambal. These natural drains and their surrounding vacant lands cover a large area. These areas being inhabitable causing uncompactness in the structure of the town as these areas are to be left open. The unauthorised settlements and slum dwellers are occupying the vacant land along these drains, causing great problems for the continuous development of the city. Further, if these natural drains are covered then the development cost will be tremendously high as the slope of the catchment area of these drains can not be reversed. Recently attention towards natural drains management is being paid to overcome the problem. Mosquito breeding, pollution, odour nuisance and other related problems are becoming serious health hazard because of this improper sanitation.

6.2.2 Civic Amenities :

(A) EDUCATION :

Kota has emerged as an important centre for education specially since 1980. The educational institutions in Kota are as follows:

TABLE 6.2

EDUCATIONAL INSTITUTIONS

	Description	Nos.
1.	Open University	1
2.	Degree colleges for general Education	5
3.	Professional or special education	5
4.	Secondary and Senior secondary schools	86
5.	Upper primary schools	145

* Source : District statistical handbook, 1994.

Master Plan estimated a need of 180 primary schools and 80 middle and senior secondary schools. But this lagging is covered by the private schools which are running in two shifts, in one shifts for primary education and in the other senior secondary or secondary education. But such schools have some administrative problems like maintenance, furniture etc. However, this problem is much more acute in government schools rather than privately run institution. The privately run institutions are having their buildings in a congested form and majority of them do not have any open play ground. Recently an institution for management courses has been added. This is also a regional centre of Indian Gandhi National Open University (IGNOU). Literacy rate of Kota as per 1991 census is 60.15 % ,which is fairly higher than that of the district, state and nation (refer Table No. 5.10) The literacy rate among male population is 69.26 % while among female population is 49.6 % .Still there is a demand to introduce much more educational institute to meet the educational policy of the state to achieve cent percent literacy.

(B)MEDICAL FACILITIES:

The town has following medical institutions :

TABLE 6.3

MEDICAL INSTITUTIONS

S.No.	Description	Nos.
1	Hospital	3
2	Dispansary	17
3	Mother Child Welfare	3
4	T.B.	1

* Source : District Statistical Handbook, 1994.

Further, the town has following distribution of beds available

TABLE 6.4

NUMBER OF BEDS AVAILABLE

S. No.	Description	Nos.
1	General	950
2	T.B.	30
3	Maternity	90
4	ENT	10
5	Eye	30
6	Mental	25
7	Child Welfare	80
8	PHC	150
	Total	1365

* Source : District Statistical Handbook, 1994.

In addition to above a 100 bedded hospital has started functioning owned by J.K. Industries. Medical college which at present is running in E.S.I. hospital campus will be shifted to its own building and campus which is under construction. When this will start functioning this will have 1000 beded additional hospital facility.

Total number of beds = 1365+100+1000=2465

Future demand -

* Population in the year 2005 A.D. = 1005750 (projected)
* No. of beds required = 4020

(T.C.P.O. standard 4 beds/1000 population.)

* Additional beds required are = 4020 = 2465

= 1555

* Population increase per 1000 industrial workers

= 20,000

* Number of beds required per 1000 industrial workers

= 60

(C) RECREATION

Most of the cities of Rajasthan do not possess water tanks, lakes, except Udaipur and Kota. Because of the availability of abundant water source at Kota, a number of tanks exist within the town, which also act as open spaces and recreational spaces. Further, some amusement parks close to water bodies are existing in the town and there is further potential to develop recreational parks and open spaces due to availability of water.

The Master Plan for Kota (1971-91) caters to these open recreational spaces at the rate of 2.5 acres (≈ 1 hectare) per 1000 population. These open spaces are distributed within the city in a hiearchial manner. The major open spaces exiting are as follows :

TABLE 6.5

MAJOR RECREATIONAL SPACES

Description	Approx. Area
1. Dashera Ground	150 Acre
2. Chambal Garden, Bhitaria Kund, Gandhi Udyan and Bal Udyan	170 Acre
3. Orchards along tanks and open spaces in industrial area	260 Acre
4. C.B. Garden, Stadium, Lucci Burj and other community facilities	250 Acre
5. Rangbari	45 Acre
TOTAL	875 Acre

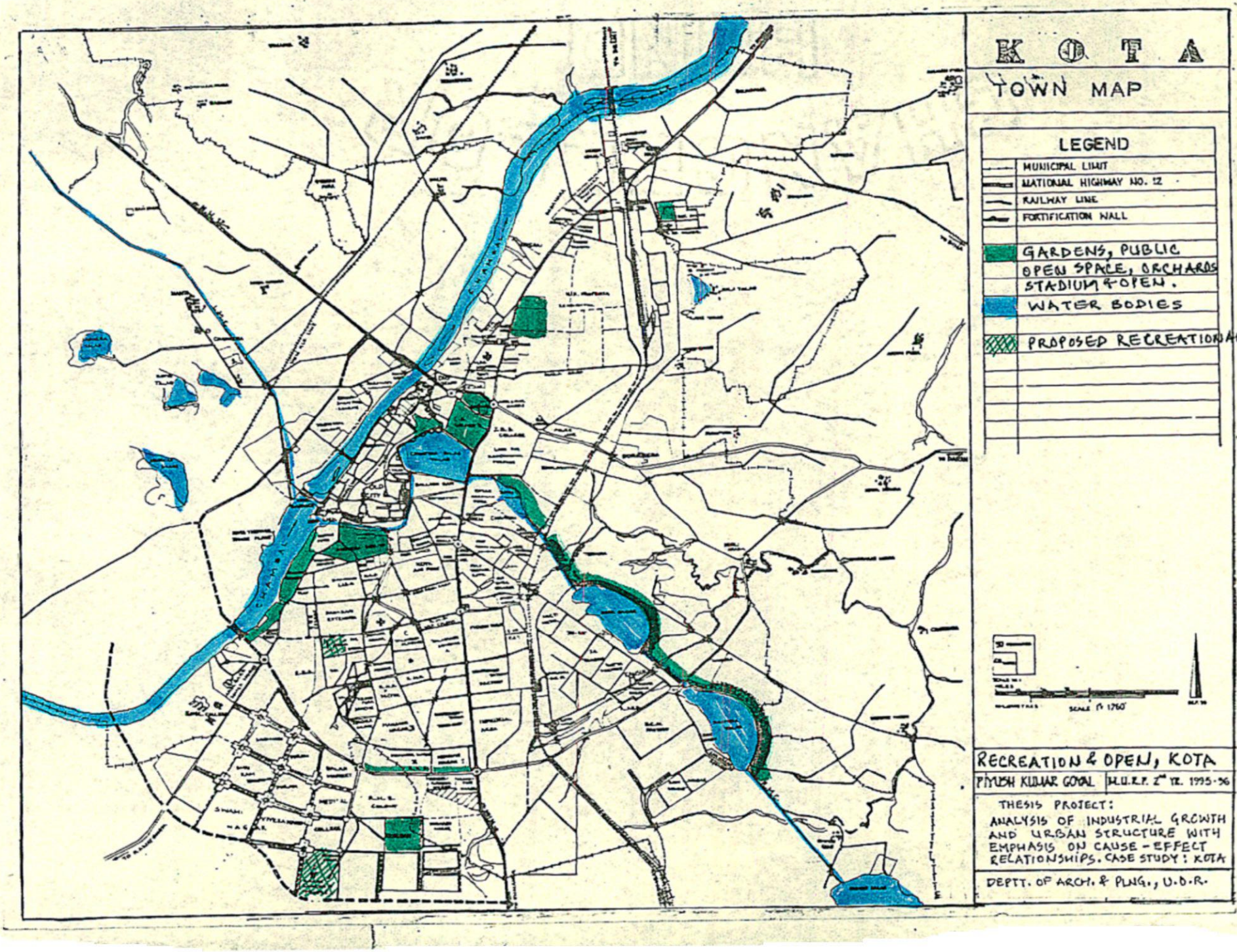
* Source : Nagar Nigam, Kota.

Among the above, Bal Udyan has been developed as Traffic Park to educate the people with the rules and regulations and their behaviour on roads. Whereas other open spaces cater to the various activities at town level or at regional level. Specially Dashera Mela, which is celebrated for a period of 15 days during the period between Dashera and Diwali festivals, is a prominent fair and about five lakh people during this period come to enjoy it from the sourranding region. The area of Dashera Ground is kept reserved exclusively for this purpose.

Future Demand:

* Population increase per 1000 industrial workers = 20,000
* Recreational space required @ 2.5 Acre per 1000 population = 20 x 2.5

= 50 Acres


K O T A
TOWN MAP
LEGEND
MUNICIPAL LIMIT
NATIONAL HIGHWAY NO. 12
RAILWAY LINE
FORTIFICATION WALL
GARDENS, PUBLIC
OPEN SPACE, ORCHARDS
STADIUM & OPEN.
WATER BODIES
PROPOSED RECREATIONAL
CHAMBAL
RECREATION & OPEN, KOTA
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Cinema Halls

There are 5 cinema halls at present running :

These are :-

Name of the Theatre	No of seats
Mohan Talkies	825
Sarovar Talkies	944
Brij Talkies	867
Mayur Talkies	1089
Akash Talkies	899

Future Demand:

* Population in 2005 A.D.(projected) = 10,06,000

* Cinema halls required = 10 (approx.)

(T.C.P.O. @ 1 No. per one lakh population)

* Additional required Cinema Halls = 5 Nos.

(D) HOUSING

Housing is an infrastructure also which provides shelter to the inhabitants. The following table gives the details.

Census year	No of occupied Houses	No. of Households	Sex ratio	Shortage of housing units
1971	42388	45026	816	1738
1981	66886	68743	836	1587
1991	97593	101783	865	4190

Source : District Census Handbook, Kota.

The above figures show that during the decades 1961-71 and 1971-81, there has been vast concentration of unmarried and single married male population.

occurred in the town. As per 1961 census the sex ratio in the town was 872 females per 1000 male. While it dropped down to 816 in 1971. Since there is a slow rise in the sex ratio as per 1981 and 1991 census. This reflects that during these two decades, there has been a trend of marriages of bachelors and shifts of family from surrounding rural areas and urban areas from the state and all over the country. This resulted in tremendous growth rate in the town which imposed pressure in the urban structure in the form of housing demand.

The population agglomeration resulted in terms of squattered settlements and slums. As per 1981 census, there were about 3855 families living in 62 katchhi bastis out of these 31 katchhi bastis have been enumerated in census 1991. These slums had a total population of 45434 in 1991. Some other katchhi bastis which have not been identified so far are also existing like Shyam Nagri K/B on Rawatbhata road, Oriya K/B in Talwandi and Dadabari (near Modi college) etc. These are observed to be about 10 in number.

In 1971, a total shortage of housing was estimated as 11750 units as per Master Plan. Out of which only 1738 was the difference in no of households and no. of occupied houses. Hence, there was a demand of 10012 housing units for the bachelors single males and the population living in the slums.

Industrial Housing

Large industrial setups like Instrumentation Ltd., J.K. Synthetics, Shriram Fertilizers and Chemicals, Multimetals etc. have setup their own townships. These townships do not cater to the cent percent residential requirement of their employees and their spill over is substaintially high causing burden on the infrastructure.

Further, Two large setups have been established on Baran road towards East of main Railway Line. These are Chambal Fertilizers and Chemical Ltd. (CFCL) and Samcor Glass LTd. Out of these two, CFCL has provided its own township but Samcor

Glass LTd.does not have any residential colony for their employees. The staff and workers of these industries are residing at Kota town and hence, are putting pressure on the urban structure of the town.

Moreover, Philips India Ltd. has recently been alloted land for its industrial setup on the Baran road about 3 kms from Samcor Glass Ltd. This plant will impose some more residential demands.

Therefore, there is a need to developed the industries in and around Kota in a planned manner. Apart from the allocation of the land for industry there is a need to frame housing policy in this regard so that detrimental pressure on the urban structure can be taken care of.

Housing Demand Projections

In 1991 the housing shortage can be estimated as below.

TABLE 6.6

HOUSING SHORTAGE ESTIMATE

Description	1971-1981	1981-1991
Population growth rate	68.19%	50.0%
Growth rate of occupied houses	54.5%	45.9%
% age defficiency of houses units	13.69%	4.1%
Defficiency of Housing units in No.	5928	2742

Hence, total shortage of housing (1991 A.D.:)

= 11750 + 5928 + 2742

= 20410

For projected year 2005 A.D. :

Total requirement will include demand at present and in furture as projected.

* Population in 1991 A.D. = 5,37,371

* Population in 2005 A.D. = 10,06,000

* Total increase in population = 4,68,629

* Total increase in number of households = 93,725
(Five members per family)

* Total demand of housing = 93,725 + 20,410

= 1,14,135 units

Total demand of housing per 1000 industrial workers

= 3,930

This calculation shows that there will be immence demand for housing during the period 1991 A.D and 2005 A.D.Urban Improvement Trust has also proposed some residential schemes, the details of which are given in the following table.

Land Values

Land values in the town have a wide range of rates. The rates are dependent on the land use. The land values in general are higher in the commercial areas, lower in the industrial areas and lowest in the residential areas.

Land values in residential areas varies tremendously as the areas in the vicinity of commercial and industrial setups are high valued while the land values decrea the distances from commercial and industrial areas increases.

6.2.3 Communication

(A) BUS STAND

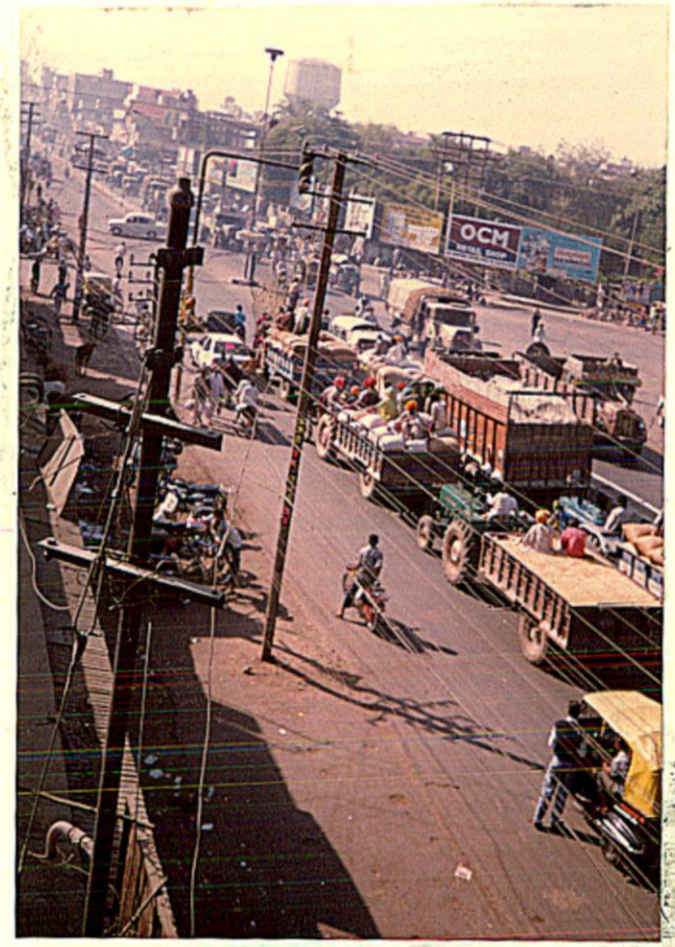
In the year 1962 Central Bus Stand was Constructed in the town. Till 1989 the NH 12 was crossing the river Chambal through a causeway. This causeway was the major bottle-neck for the highway traffic. Subsequentely, with the develoment of the town the pressure on the urban structure forced to utilize the portion of NH 12 falling within the city as a city road. In the year 1989, construction of an all-weather two-lane over bridge was completed. This over bridge has now facilitated the traffic on the Highway to enter the town avoiding held-ups.As a result, the traffic flow could be improved.

The Kota town is being served by a large number of buses(total 334 buses) out of which Kota depot caters to 121 buses and rest of the buses are from the connected depots. The following table shows the details :

Description	No.of Trips per day
Total No of buses	334
Express Buses	202
Local Buses	118
Semi Delux Buses	14

* Source : Chief Manager, Central Bus Stand, Kota.

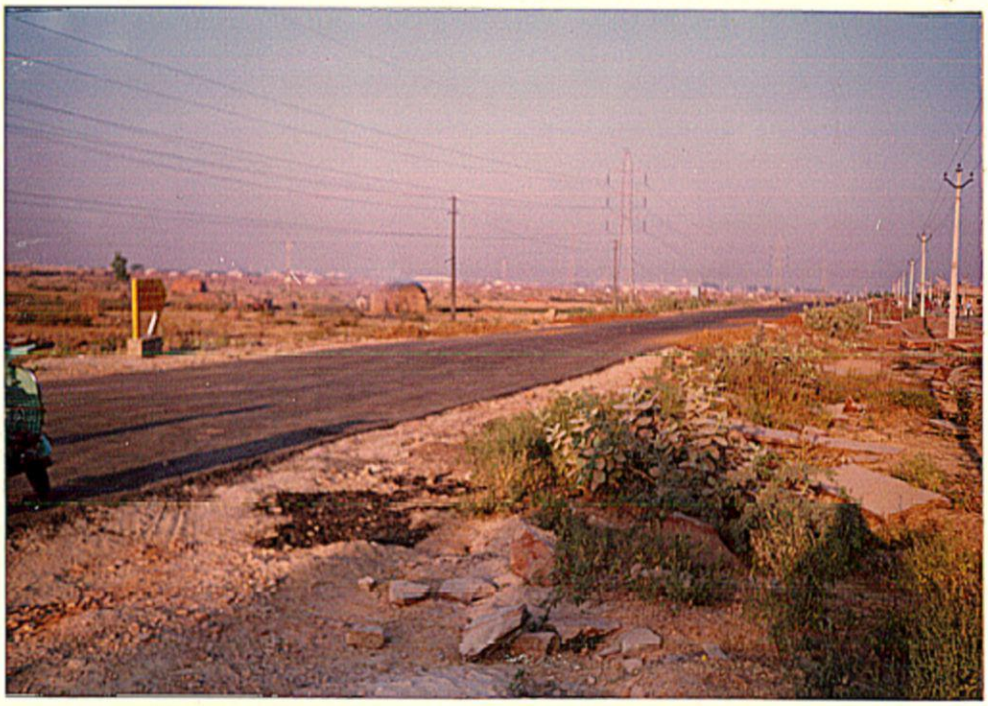
CIRCULATION



1. NORMAL TRAFFIC AT CHHAWNI CHAURAHA (ON NH 12) WITHIN THE CITY

2. LARGEST ROUND ABOUT OF KOTA KNOWN AS AERODROME CHAURAHA

3. TRAFFIC OF NH 12 COMING FROM SOUTH IS CHECKED TO ENTER THE TOWN



4. PREVIOUSLY PROPOSED BYEPASS TO NH 12 WHICH WILL SERVE AS CITY ROAD NOW

Apart from these about 50 privately owned buses are also running for which there is no separate Bus Stand. These private buses take off from the place in front of Central Bus Stand which is located in the Nayapura area which is one of the highly congested areas in Kota. Some of the problems of this area as this is the major traffic generation point are as follows :

(i) No space for parking of buses.

(ii) Insufficient space for movement of buses.

(iii) No space for parking of private vehicles e.g. motor cycles, scooters etc.

(iv) Congestion because of parking of private buses.

(v) Congestion due to development of commercial activities around.

(vi) Congestion created by the private taxies and jeeps.

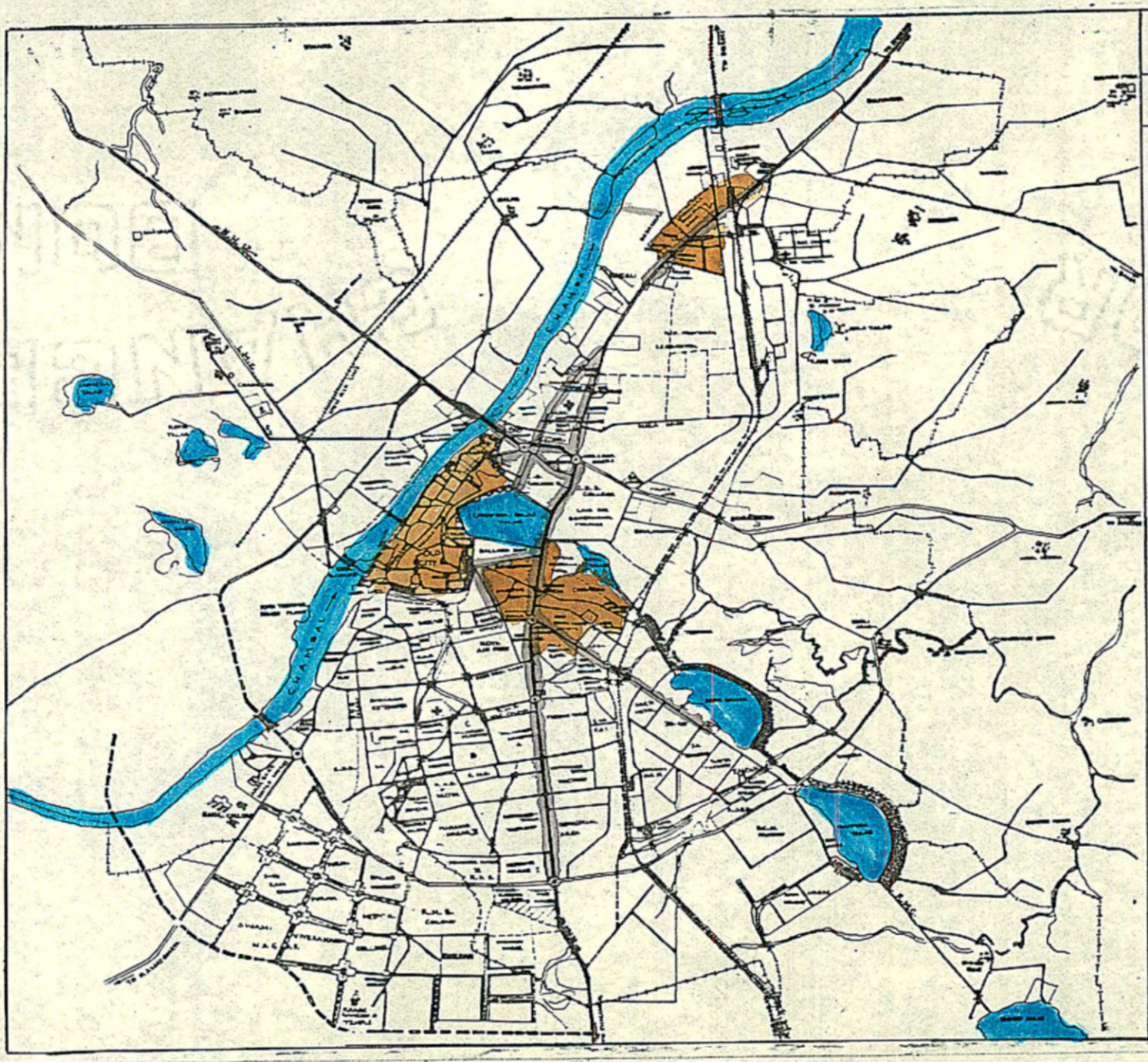
(vii) Behaviour of people in an ill-mannered way.

The problem has been aggravated further with the establishments of industrial setups which add much more traffic to fulfil their requirements for raw materials and finished products transportation.

(B) RAILWAYS

As already discussed under 4.1.5(A). Kota has been identified as an important railway station of the state. This is also a junction of Delhi-Bombay main broad gauge railway line and Kota-Bina broad gauge railway line. At present 46 trains have their stoppage on this railway station out of which 23 are down trains and rest 23 are up trains.

Becuase of the development of the town in southward direction, town has reached upto 18 kms away from the railway station in the south. Location of Industrial Areas and Industrial Estates is mainly concentrated in the south east of the town. To cater



K O T A

TOWN MAP

LEGEND

- MUNICIPAL LIMIT
- NATIONAL HIGHWAY NO. 12
- RAILWAY LINE
- FORTIFICATION WALL
- AREAS WHERE EVERY TYPE OF CONGESTION PERSISTS.
- WATER BODIES
- ROADS ON WHICH TRAFFIC IS HIGHLY CONGESTED

SCALE IN 1750'

CIRCULATION CONGESTION, KOTA

PIYUSH KUMAR GOYAL | M.U.R.P. 2nd YR. 1995-96

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to the needs for transportation of goods and people, as a consequence of above, a subsidiary railway station named as Dakania railway station with in the town has been developed. To some extent it could relieve the burden from the main railway station.

(C) TELECOMMUNICATIONS

The Kota city at present is having three working telephone exchanges and one proposed telephone exchange. The details are as below.

TABLE 6.8

TELEPHONE EXCHANGES

S.No.	Exchange	Location	Category	year of est.	no of lines
1	M.A.X.I	Nayapura	Mannual	1975	10000
2.	E-10-B	Vigyan Nagar	Electronic	1994	Iphase-5000 IIphase-3000 IIIphase -3000
3.	2-K-RLU	Kota Jn.	-do-	1995	2000
4.	4-K-RLU	Chhawni	-do-	Target March '96	4000

* Source : Deptt. of Telecomm. , Kota.

The waiting list in the town for telephole connection since 1989 as follows

As on		Own your telephone (OYT) General	Special	Non OYT General	Special
1989		269	48	3549	306
1990		429	163	5062	469
1991		411	76	7149	525
1992		663	160	10383	837
1993		725	188	11371	998
1994	MAX I	Nil	Nil	5946	68
				10,658	213
	E-10-B			4712	145
1995	MAXI	Nil	Nil	4988	55
	E-10-B	- -	- -	4297	13
				9727	72
	2-K-RLU	- -	- -	398	
	4-K-RLU	- -	- -	45	04

* Source : Deptt. of Telecomm., Kota.

The target year to clear the entire waiting list is 1997.

(D) INTRACITY TRAFFIC

The increasing industrialisation caused the tremendous population concentration of industrial workers and supporting population. This increased population causes more traffic concentration on the roads as they have to travel distances for journey to work place, journey for shopping, recreation and communication. Further, they also travel to utilize the amenities and facilities. This 'overcoming of distances' on the basis of Guttenberg's Principle (refer

2.1.2) affects the urban structure most. Few problems identified are as follows :

1. High traffic volume on the part of NH 12 within the city. This includes each intercity and intracity traffic.
2. Few intersections are also identified where traffic congestion is excessive. These intersections are usually located in the region between the walled and rest of the city.
3. The roads within the walled city are extremely congested as the right of way of the major roads are being 10 ft. to 15 ft. wide. This region, on one hand is highly populated (density being quite high) while on the other hand this also serves as Central Business District (CBD) for formal and informal shoppings.
4. Old parts of the city are not having any provision of parking areas. The road side parking clearance is available on few rods which are insufficient. Vehicles are parked on road and cause traffic jams. Further, these areas also have problems of slow moving traffic like Thela, Cycle Rikshaws, Bicycles and a number of pedestrians.
5. Few areas like Transport Nagar, Shopping Centre, Chhawni, Nayapura, Railway junction, Motor market in the newly developed area are also alarming because of high traffic concentration within these areas.

Following are some proposals to ease out the traffic problems in Kota city which are under implementation :

Byepass to National Highway No. 12

(i) Western Byepass:

In the Master Plan a byepass joining Anantpura to Bundi road across the river was proposed. Due to expansion of the city to large dimensions in the southward direction,it now falls within the existing residential areas and proposed residential area. A new byepass connecting Bundi road to Jhalawar road near Rangbari across the river is suggested [refer 6.1.5(C) also].

(ii) Eastern Byepass:

An eastern byepass is under construction which will connect Anantpura to Antaghar Chauraha. This lies in the East of N.H.12 and passes from the area beyond the Dakania Railway station. This byepass will ease out about 60 % of the traffic problem between the Anantpura and Antaghar Chauraha on exisiting highway.

Walled City

Due to the compactness of the region there is no vacant space left which can be kept for parking purposes.Hence, no entry for heavy vehicles in areas within the walled city is permitted. Only two wheelers are allowed to enter the region.

Widening of roads

Extensive measures are being taken to smoothen the traffic flow which include widening of roads and construction of physical dividers.

(E) MASS TRANSPORTATION

At present public transpotation is being catered through 450 tempos and 60 mini buses. Though in numbers these figures seem to be adequate but there is an irrational distribution of these vehicles on various routes within the city. Some routes are under-stressed while some routes are over-stressed from the point of view of number of tempos and mini buses on the route.

Moreover, these vehicles create a high decible level sound pollution besides the considerable air pollution. This problem should be taken care of and the mass transportation phenomena should be introduced. Number of buses should be run on major routes and also to join extreme ends of the city. A wide communication gap exits between the parts of the city located on either bank of the river Chambal. Parts of the city on Rawat Bhata road are also not being served by public transportation.

Hence, a holistic approach to connect every part of city with proper mass communication linkages should be followed. This is the most important consideration for achieving a balanced urban structure.

6.2.4 Shopping

The new shopping centre having a status of Central Business District (CBD) had been proposed in Master plan to relieve the pressure on then existing CBD within the walled city. This new centre covers the areas of shopping centre, New Grain Mandi, Gumanpura on both side of NH 12 which has further increased the propblems of traffic movement on NH 12, as, this NH within the city is also serving as city road leading to traffic congestion in the commercial areas. This is recommended that the NH should be separated.

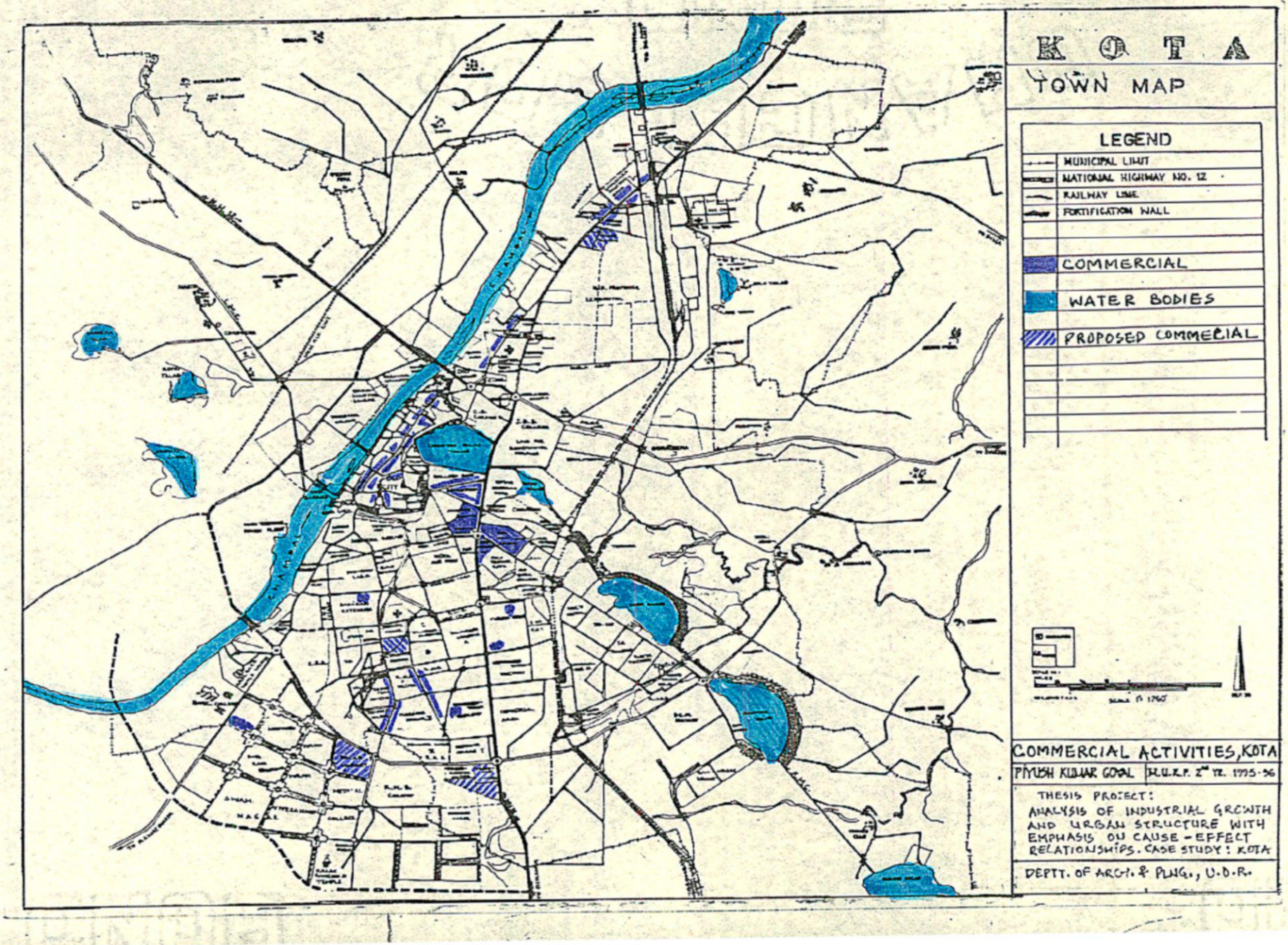
Two subdistrict centres were also proposed as per Master Plan one in North near Manoj Talkies (which has been demolished now) and other in south near Jawahar Nagar. None of these commercial complex have developed so far. Sector level shopping facilities are available in Vigyan Nagar, Mahaveer Nagar, Talwandi and Dadabari areas. More over, the area from Commerce College Chauraha to Mahaveer Nagar Extension (Via. Talwandi-Keshavpura Chauraha) is developing as subdistrict centres. Following tabel shows the number of shops registered in the town since 1985.

TABLE 6.9

REGISTERED SHOPS

Years	No. of registered shops	Increase in the Year
Before 1985	20318	-
1985	21069	751
1986	21805	736
1987	22506	701
1988	23308	802
1989	23909	601
1990	24735	826
1991	25626	891
1992	26801	1175
1993	27570	769
1994	28301	731
1995	29167	866
	Total	8098

* Source : Labour Registar Office, Kota.


K O T A
TOWN MAP
LEGEND
MUNICIPAL LIMIT
NATIONAL HIGHWAY NO. 12
RAILWAY LINE
FORTIFICATION WALL
COMMERCIAL
WATER BODIES
PROPOSED COMMERCIAL
CHAMBAL
CITY
COMMERCIAL ACTIVITIES, KOTA
PIYUSH KUMAR GOYAL
M.U.R.P. 2nd YR. 1995-96
THESIS PROJECT:
ANALYSIS OF INDUSTRIAL GROWTH AND URBAN STRUCTURE WITH EMPHASIS ON CAUSE-EFFECT RELATIONSHIPS. CASE STUDY: KOTA
DEPTT. OF ARCH. & PLNG., U.O.R.

All the residential schemes proposed by Urban Improvement Trust have provision of commercial plots as given in the table below :

TABLE 6.10

COMMERCIAL PLOTS IN PROPOSED RESIDENTIAL SCHEMES

Name of Scheme	Commercial plots
1. Shrinath puram	787
2. Subhash Nagar	-
3. Veer Savarker Nagar	9
4. Patel Nagar	445
5. Shri RAm Krishna Nagar	1113
6. Vivekanand Nagar	560
7.Arogya Nagar	360
8. Balaji Nagar	166
9. Vinoba Nagar	660
10. Kabir Nagar	12
11. Mahaveer Nagar	418
Total	4630

* Source : Urban Improvement Trust, Kota.

Moreover, few commercial schemes have also been proposed to cater to the needs of future shopping requirements in the town . These are as follows:

TABLE 6.11

PROPOSED COMMERCIAL SCHEMES

S.No.	Future commercial schemes	Plots
1.	Tranport Nagar	Details not available
2.	Vishwa karma Nagar	907
3.	Stone Mandi extension	144
4.	Hadoti Patthar Mandi	252
5.	Balaji Market	260
6.	Shri Svami Market	140
7.	Dadabari Distt. Centre	484
8.	Taigore Nagar	Details not available
9.	K.L.4 Super Market	Details not available

* Source : Urban Improvement Trust, Kota.

6.2.5 Ward Wise Distribution of town

Kota had been divided into 45 wards as per 1991 census. In Jan.1995 the redistribution of wards was done because of addition of sum new areas within the town. At present Kota is divided into 60 wards. The pattern of distribution was grid pattern earlier while now the distribution is done in a spiral fashion. This pattern of distribution does not seem to be following any specific phenomena as it is very difficult to trace the areas of these wards from planning point of view.

6.2.6 Pollution in Kota

Broadly speaking environmental pollution is not a serious problem for the city of Kota not withstanding the fact that the city has in recent years witnessed high rates of industrial growth. While in specially created Industrial Areas and Industrial Estates both air and water pollution have been within the acceptable limits. In the old city barring the leather industries, industrial pollution has remained reasonable. Nevertheless the government has fairly strict with regard to pollution and the

Rajasthan state pollution control board has specified the following air and water pollution standards.

(A) AIR POLLUTION (in kg/m³)

TABLE 6.12

AIR POLLUTION STANDARDS

TYPE OF POLLUTION	SPM	NO_x	SO_2
INDUSTRIAL	500	120	120
RESIDENTIAL	200	80	80

* Source : Rajasthan State Pollution Control Board, Kota.

(B) WATER POLLUTION

TABLE 6.13

WATER POLLUTION STANDARDS

PARAMETERS	ACCEPTABLE LIMITS
pH	5.5 to 9
TDS	2100 ppm
TSS	100 ppm
OILS AND GREASE	10 ppm
COD	250 ppm
BOD	30 ppm

* Source : Rajasthan State Pollution Control Board, Kota.

In addition to above for grant of consent to operate the industries have been categorized as under

CATEGORY	DURATION FOR WHICH CONSENT IS GRA
RED CATEGORY	Upto a period of 3 years
ORANGE CATEGORY	for 5 years
OTHERS CATEGORY	for 15 years

The above categorisation of industries is based upon the pollution created by them. Red industries are maximum pollution prone while others category is related with the least pollution creating industries.

While Kota is generally pollution free it is significant to mention the growing pollution potential of flyash and coal dust from the thermal power plant. The flyash pollution is causing nuisance because of the prevailing wind directions in the town from west to east and the thermal power plant is location west of the river Chambal. Therefore, any complacency part of local administration may cost city dearly in future.

6.3 AREAS OF CONFLICTS AND COMPATIBILITY

On the basis of analysis done in the preceeding section various areas of conflicts and compatibility are identified.

6.3.1 Areas of Compatibility

Presently the following areas are found to be compatible:

1. Availability of power supply.

2. Availibility of water.

3. Open spaces and public spaces for recreation.

4. Road network in the city developed after Master Plan implementation, though some intersections are identified where traffic problems persist. However, these may be improved with minor modifications.

5. Educational Facilities.

6. Availability of suitable land for future expansion.

These areas of compatibility will be inadequate if more industries establish and lead to the deterioration in the present conditions. Therefore, to cater to the further industrial developments and planned urban structure these need to be improvised.

6.3.2 Areas of Conflict

The areas which are found to be conflicts for a balanced urban structure are identified in preceeding sections. These areas can be divided in the following manner:

(A) REQUIRING MAJOR IMPROVEMENTS

1. Seggregation of intercity traffic on NH 12 from intracity traffic.

2. Sewerage and drainage system.

3. Removal of unregularised slums and improvement of regularised slums.

4. Housing demand.

5. Problems of old part of city which involve sewerage and drainage system, circulation, parking areas, shifting of commercial activities.

6. Health facilities.

7. Development of new Transport Nagar at appropriate location.

8. Location of Aerodrome within the heart of the city.

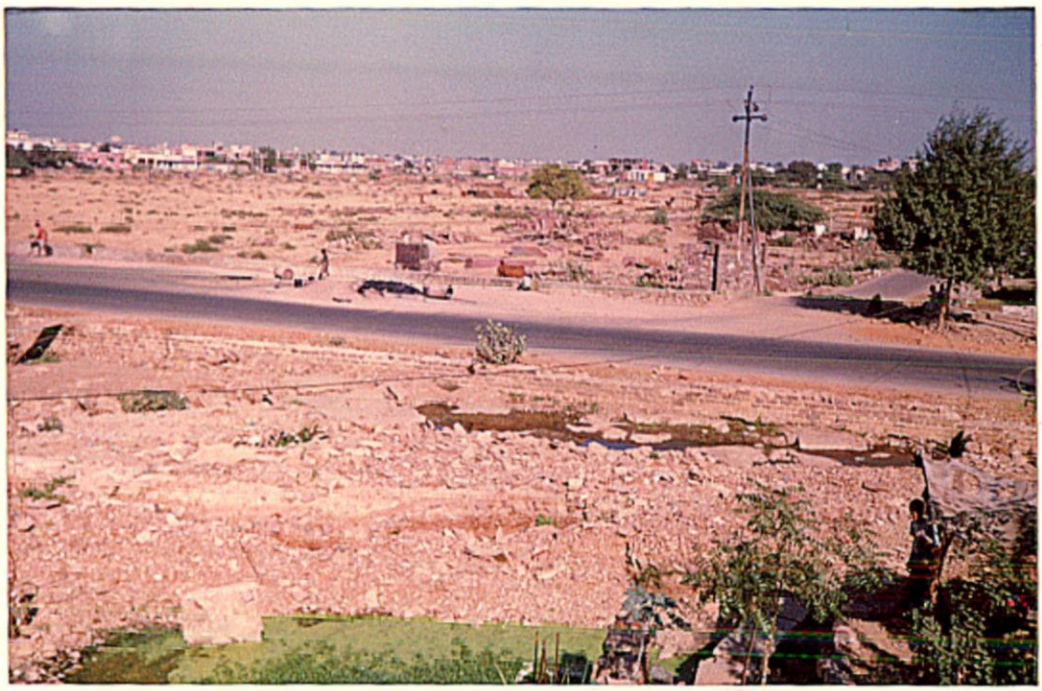
9. Location of idustries beyond the limits of Industrial Estates and Industrial Areas.

(B) REQUIRING MINOR IMPROVEMENTS

1. Congestion at some intersection.
2. Shopping facilities at sector level.
3. Rational distribution of mass transportation system.

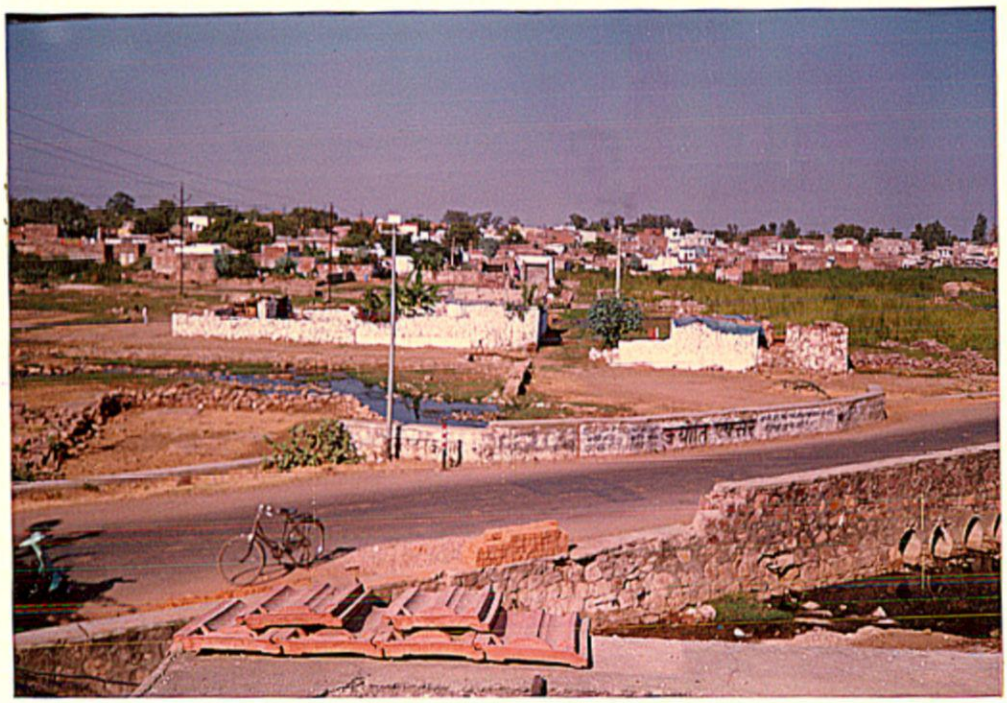
These are the various areas of conflict which, if not given proper attention and advance planning thought, would grow more severe. With the further industrial establishments the urban structure may lead to a chaotic condition. Hence, these areas require serious attention so as to achieved a balanced urban structure of the town.

PATCHES OF VACANT LAND WITHIN TOWN



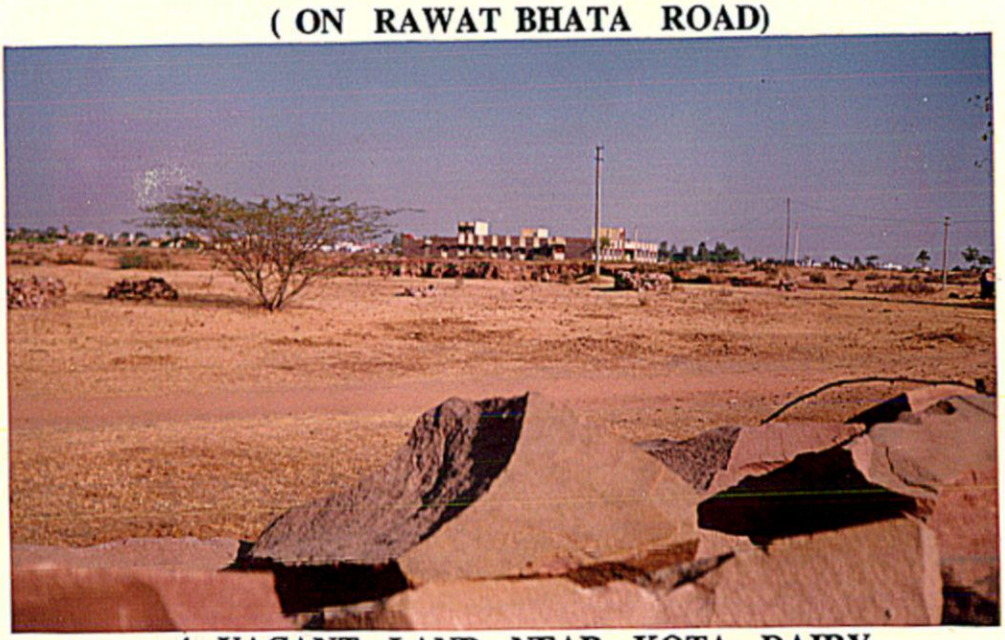
1. VACANT LAND OPPOSITE TO JAWAHAR NAGAR WHERE SUB DISTRICT COMMERCIAL CENTRE WAS PROPOSED.

2. VACANT LAND BEHIND AIRPORT.



3. VACANT LAND NEAR DADABARI EXTENSION

(ON RAWAT BHATA ROAD)



4. VACANT LAND NEAR KOTA DAIRY

(ON RAWAT BHATA ROAD).

Chapter-7

PLANNING STRATEGY

On the basis of this study, it can be revealed that if industries be the input in any town to boost the economy of that region, it severely affects the urban structure of that town. This occurs because there exist a multiplier effect on the population concentration. This vast human agglomeration demands for the development of dynamic as well as static form of the urban structure. The issue is how these should be integrated and planned.

Analysis of urban structure along industrialisation highlights on various areas of conflicts and compatibility. Keeping these altogether in mind the following planning strategy is suggested.

7.1 STRATEGY FOR DEVELOPMENT OF INDUSTRIES

Thi cosists of following recommendations :

1. New large scale industries should be checked within and in the vicinity of Kota.
2. Small scale industries and ancillary industries should be encouraged. These industries are categorised in terms of resource based, demand based and artisan units (refer 4.5), so as to utilize the available resources optimally without causing any much burden on urban structure.
3. Existing industries located within the residential areas,especially in the old parts of the city (where population density is observed to be very high), should be removed and the space so evacuated should be developed to improve urban structure.
4. Establishment of industries beyond Industrial Estates and Industrial Areas should be checked through strengthening the legal tools against

pressure from the urban structure by reducing number of trips to CBD of the people to avail the commercial facilities not available in the near by areas.

5. A wholesome approach for the development of the circulation pattern in the town should be adopted which may include :

* Construction of byepass to NH 12 should be commenced as early as possible so as the seggregate of inter city traffic from intra city traffic. This will remove the major part of the traffic problems in the city.

* Intersections having traffic problems should be improved through some technological developments to ease out the traffic congestions and smoothen the flow.

* Mass transportation system should be introduced and every part of the city should be connected so as to remove communication gaps.

* Parking areas should be created within walled city and other old areas of the city. Some new commercial areas e.g. Gumanpura, Chhawni, Transport Nagar, New Grain Mandi etc.are also alarming as congestion is increasing due to road side parking. Hence, parking areas should be created in these areas also.

* Conditions at Central Bus Stand should be improved by creating parking spaces. A Bus-Stand for private buses should be developed at convenient place.

6. There is a need to upgrade medical facilities in the town. New Govt. hospitals should be established to provide cheap medical facilities. Number of beds per 1000 population should be increased.

7. More intensive programmes to literate the local people and also to train the local people as skilled workers should be introduced. This

will help in achieving the target of cent percent literacy by the year 2000 A.D.

8. An adequate attention should be paid to the possible increase in urban activities prompted by mushrooming of industrial units along the Baran Road towards East of main Railway line.

9. Vacant patches of land within the town should be developed to cater to the improvements. This will provide a compactness and continuity in urban structure.

10. Existing and upcoming new large scale units establishments should be enforced to develop their own infrastructure (e.g. housing, roads, sewerage & drainage, water supply etc.) for employees.

11. The growth direction of town should be shifted from south as this unidirectional growth direction have resulted in the increased lengths of trips to avail facilities and amenities. The growth dynamics in the directions East of the main railway line on agricultural land and West of the river Chambal on barren and rocky land should be given proper thought immediately. These areas should be developed for residential purposes to meet the enormous housing demand in future.

The above factors of planning strategy are suggested to be incorporated in the planning practices for the Kota city. Besides the old parts of the city it is not very difficult to improve the conditions if given advance planning thought. Hence, an integrated approach should be followed step by step so as to achieve a more balanced urban structure of Kota city.

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