DEVELOPMENT PROPOSAL FOR THE RURAL SETTLEMENTS, U.T. CHANDIGARH

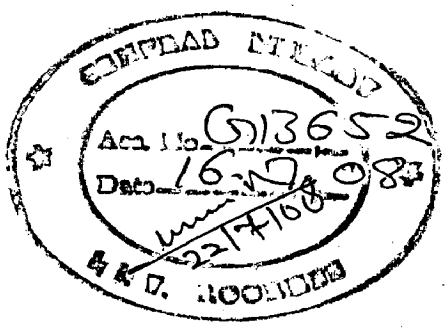
A DISSERTATION

Submitted in partial fulfilment of the requirements for the award of the degree of

MASTER OF URBAN AND RURAL PLANNING

By

SOMDHWAJ BANSAL



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CANDIDATE'S DECLARATION

I hereby certify that the work, which is being presented in the dissertation entitled **'Development Proposal for the Rural Settlements, U.T. Chandigarh',** in partial fulfillment of the requirement for the award of the degree of **Master Of Urban And Rural Planning,** submitted in the Department of Architecture and Planning, Indian Institute of Technology - Roorkee, is an authentic record of my own work carried out during the period from May 2006 to June 2007, under the supervision of **Prof. Rajesh Chandra**, Department of Architecture & Planning, IIT Roorkee.

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

Date: 28-06-07

Place: Roorkee

Somdhwaj

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CERTIFICATE

This is certified that the above statement made by the candidate **Mr. Somdhwaj Bansal** is correct to the best of my knowledge.

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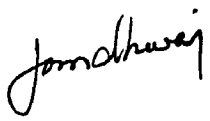

(Somdhwaj Bansal)

ABSTRACT

India is a developing country, although in recent years it has achieved a tremendous growth rate, but we can not ignore the fact that more than two third of the population is still living in rural areas. In spite of some radical changes in the cities, the rural communities have been stagnant for generations. These are facing critical absence of facilities & utilities which are fundamental & basic to the existence of the people & a right of every individual. The rural settlements in the vicinity of urban areas are the worst affected, with added load of immigrants to the city, which mostly take shelter in the fringe rural settlements.

Chandigarh a modern city has seen a remarkable success, providing a high quality of life to its citizens and growth at tremendous pace. But Despite being meticulously planned, the overshooting population, mostly a result of immigration is causing the problems, common to all developing urban areas, but never dreamt of.

The union territory consists of an urban area, 6 urban villages & 16 rural settlements on the fringe of urban area. The rapid growth in the population, filtering to the settlements on the fringe, has put tremendous pressure on existing infrastructure, which was already inferior. There is further a problem of haphazard growth taking place in absence of bye-laws & proper land-use planning.

Infrastructure is the framework from which all development activities by the community, institutions and industry draw their sustenance.

Against this backdrop this dissertation provides for a plausible development proposal for rural settlements for achieving balanced development. It focuses on providing an appropriate level of infrastructure, planned and made available within the rural settlements,

independent of the city. It further provides a proper land-use concept to help in accommodating the growing population in the rural settlements in a planned manner, in order to make them effectively sustain themselves & contribute to the growth of the region and usher in an era of long-term prosperity.

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1. INTRODUCTION

1.1 BACKGROUND

India is a developing country and what it means is that more than two-thirds of the population lives in the rural areas (the census 2001 figure is 72 per cent.). Unlike developed countries, "rural" in India means critical absence of physical infrastructure (water supply, electricity, roads & transportation, sewerage & solid waste disposal) and social infrastructure (schools, healthcare, community facilities etc). Moreover the villages of India are caught in a vicious circle of poverty, malnutrition, illiteracy, ill- health, low productivity, lethargy and ignorance. The rural problems are, therefore, multidimensional.

In spite of some radical changes in the cities, the rural communities have been stagnant for generations. Although, urbanization increases over time due to

- Technical definition of a town and a village (setting the number of inhabitants as a criterion), over a period of time, villages become towns.
- Some former villages are taken over by towns.
- Rural to urban migration due to lack of employment opportunities in rural areas, reinforced by better infrastructure facilities in urban areas, makes some villages disappear.

But despite this even in 2050, the urbanization rate in India will not be more than around 40 per cent, and 60 per cent of the population will still live in rural areas. Thus it is clear that rural areas are in need of great impetus in the field of comprehensive rural development more so towards infrastructure.

1.2 IDENTIFICATION OF THE PROBLEM

As a modern city, Chandigarh has seen a remarkable success, providing a high quality of life to its citizens and growth at tremendous pace

- The economic activities and the employment opportunities have increased manifold in the Chandigarh region
- Chandigarh's infrastructure, proximity to Delhi and Punjab, and the IT talent pool attracts IT businesses looking for office space in the area.
- Connectivity - There are proposal for international airport in Chandigarh and there is also a proposal for metro network in Tri-city namely Chandigarh, Mohali and Panchkula. Double-laning of Chandigarh Patiala and Chandigarh Ambala links has already been stared
- Chandigarh IT Park (also called Kishangarh IT Park) has come up. Major Indian firms and multinational corporations including Dell, Infosys, Quark, Ranbaxy, Reliance and Satyam have offices in the park.

A) RESULT

- These factors have combined to attract not only middle and upper class families but also workmen, skilled and unskilled, and petty tradesmen from more economically depressed areas of the country seeking employment.
- In the jurisdiction of Chandigarh there are presently 16 rural settlements as under:- Apart from that 6 are urban villages. As these rural settlements, falling in the UT area, are physically very close to the urban nucleus, the city exerts a direct influence on them. And the migrating low income people, with having no means to live in the urban area, as there is no sufficient affordable accommodation available in the urban area, mostly reside in the rural area, which have no regulations & relatively very low land rates.

Table 1.1: Land Cost in Chandigarh & Neighboring Towns

S.No.	Location		Land cost in rs. (per sq.m.)
1.	**Chandigarh Urban**		
		Sector 2	43,500 – 58,000
		Sector 9	51,000 – 68,000
		Sector 27	51,000 – 60,000
		Sector 35	55,000 – 68,000
2.	**Chandigarh Rural**		
		Maloya	10,000 – 12,000
		Dhanas	14,500 – 16,500
		Sarangpur	21,500 – 24,000
		Khuda Jassu	16,500 – 18,000
3.	**Panchkula**		20,000 – 50,000
4.	**Mohali**		20,000 – 50,000

Source: indiaproperty.com

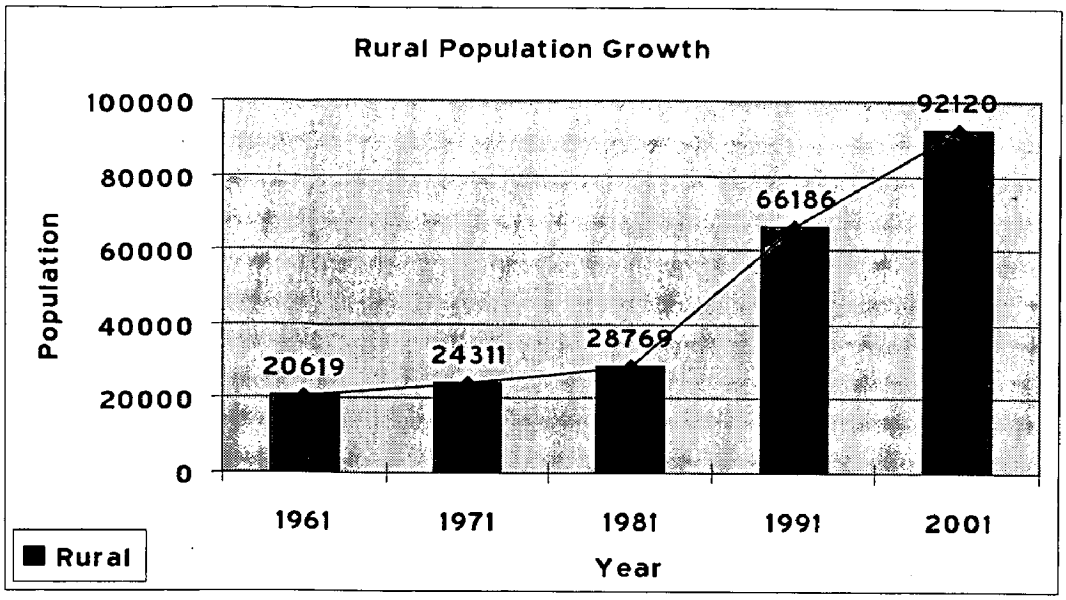
- In 1961 the rural population of Chandigarh was approximately 20619 which have increased to 1 lakh approx. in 2001. it has registered third highest (39.18) decadal growth rate after Daman & Diu & Lakshadweep

Table 1.2: Rural population growth in UT Chandigarh

	1961	**1971**	**1981**	**1991**	**2001**
Rural	20619	24311	28769	66186	92120

Source: *statistical Abstrct-2005, UT Chandigarh*

Fig 1.1: Rural population growth in UT Chandigarh



- The rapid growth in the population has put tremendous pressure on existing infrastructure which was already inferior. Further in absence of any planning & bye-lawas governing the growth, it is going on in haphazard manner, worsening the condition

Thus there is urgent need that rural population which is increasing rapidly be accommodated in such a way so that they may enjoy quality living

Infrastructure is the foundation and bedrock, on which the entire structure of communities, state and nation is built and made to stand. It is the framework from which all development activities by the industry and institutions draw their sustenance. Thus, provision, maintenance and quality of infrastructure assume critical importance in promoting sustainable growth and development.

Against this backdrop, it becomes essential that an appropriate level of infrastructure is planned and made available within the rural settlements, independent of the city, in order to make them effectively sustain themselves & contribute to the growth of the region and usher in an era of long-term prosperity.

1.3 AIM

To provide a plausible development proposal for rural settlements for achieving balanced development.

1.4 OBJECTIVES

- To assess the existing socio-physical condition of the rural settlements & their development status
- To forecast the demand of infrastructure facilities in the study area
- To ensure the provision of all basic amenities needed for rapidly growing rural population, simultaneously identifying & ensuring facilities which are needed at city level within the rural area, by incorporating proper land use planning.
- To improve living conditions in the settlements which will help in the balanced development of the region as a whole

1.5 SCOPE & LIMITATIONS

- The present study aims at providing an infrastructure development proposal for the rural settlements falling within Union Territory, Chandigarh.
- The villages falling within the municipal limits will not be included in the study
- Due to time constrain study & proposal for only one contiguous pocket of settlements, on the western limits of city will be done

1.6 METHODOLOGY

1.7.1 IDENTIFICATION OF THE PROBLEM

Through initial background studies & discussion with dissertation guide Identification of

the problem is done.

1.7.2 INFORMATION COLLECTION

A) SECONDARY DATA COLLECTION THROUGH LITERATURE STUDY

Access governmental and nongovernmental, national and local organizations as well as there portals for collecting relevant matter in the form of maps, drawings, figures, graphs, tables etc related to individual villages as well as the UT region

B) PRIMARY DATA COLLECTION THROUGH FIELD SURVEY

Views, issues and perspectives of the locals. Also include discussion with concerned village official & taking photographic record where necessary, of the existing physical condition of settlements.

C) LITERATURE STUDIES

Undertaking & researching case studies which are relevant to the objectives of the work as well as consulting norms & standards concerned

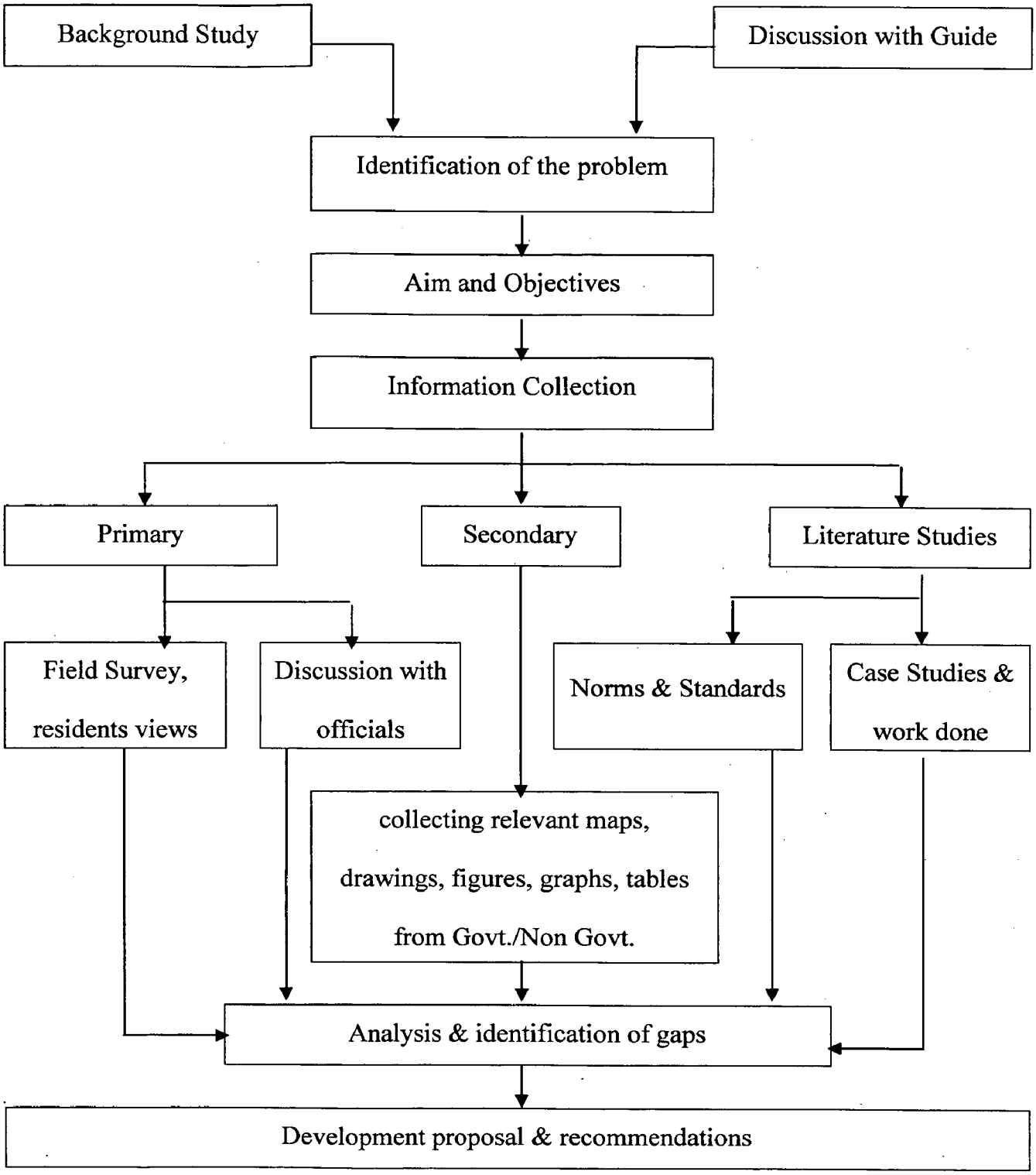
1.7.3 ANALYSIS & IDENTIFICATION OF GAPS

On the basis of data collected, norms / requirements & case studies the gaps in resources / infrastructure existing in the settlements are to be identified in this phase.

1.7.4 DEVELOPMENT PROPOSAL & RECOMMENDATIONS

This is the last phase and the plan proposal & recommendations for development of the settlements will be made, prepared on the basis of analysis of perception of the people recorded in phase-II and with reference to information available in phase -I and III.

Fig 1.2: Methodology of the study



2. LITERATURE STUDIES

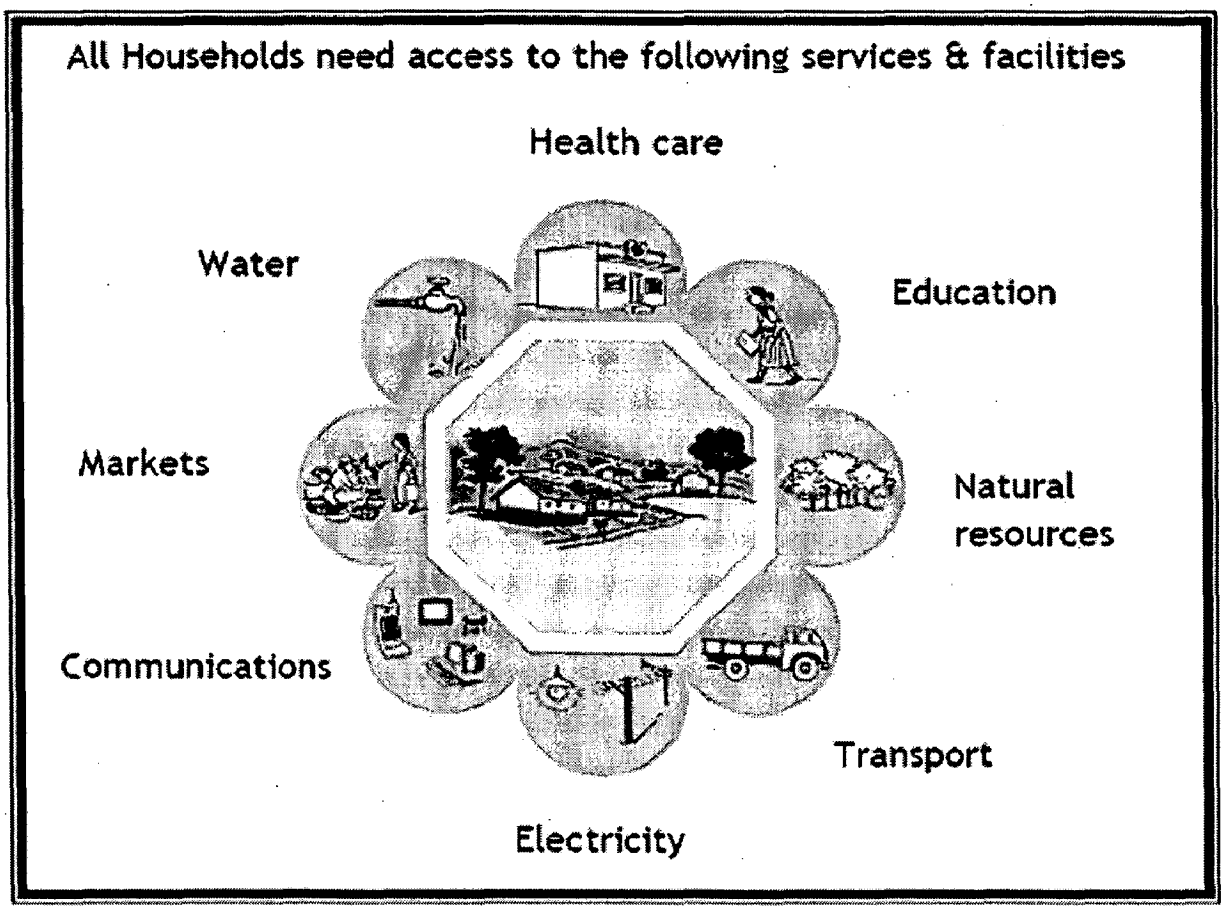
2.1 RURAL INFRASTRUCTURE

2.1.1 BACKGROUND

Infrastructure is the facilities or utilities which are fundamental & basic to the existence of the people (for comfortable living & working) and their settlements (for smooth functioning)

Provision of the facilities and services is important for survival, growth and well-being

Fig 2.1: Facilities & services needed for a household



2.1.2 TYPES OF INFRASTRUCTURE

Infrastructure is classified broadly into four types – physical, social, commercial & recreational, which are detailed below:

A) PHYSICAL

- Water supply
- Power
- Sewerage
- Drainage
- Solid waste disposal
- Road network

B) SOCIAL

- Education
- Health
- Socio-cultural or community facilities
  - Religious sites
  - Community hall
  - Socio cultural centre
  - Cremation/burial ground, cemetery
- Distributive services (LPG godown, fair price shops etc.)
- Others
  - Bus stop
  - Communication
  - Postal service
  - Security service
  - Fire services

C) COMMERCIAL

- Shopping
- Dairy
- Market
- Banks

D) RECREATIONAL

- Park & open spaces
- Sports centre & playgrounds
- Water bodies
- Cinema/theatre

2.1.3 DETERMINANTS OF INFRASTRUCTURE PROVISIONING

- Type & hierarchy of infrastructure varies from urban to rural settlement
- Besides level of Infrastructure required is decided generally by population size & area of the settlement
- Climate, physiographic, culture & available resources also may affect the requirements

2.1.4 RURAL DEVELOPMENT & INFRASTRUCTURE

Rural development is defined as structural changes in the socio-economic situation to achieve improved living standard of population residing in rural areas and making the process of their development self sustained.

It includes economic development with close integration among various sections and sectors; and economic growth specifically directed to the rural poor.

- Rural development is one of the important tasks of development planning in India.
- Development of rural areas is slow due to improper and inadequate provision of infrastructure with compare to urban areas.
- The planning and development of human settlements and provision of required infrastructure are much better in urban areas.
- Rural population migrates to near by City due to more employment opportunities and better facilities due to limited capacity of rural economy to accommodate the increasing population. Thus there is a need to encourage reverse migration to rural areas through proper development of rural infrastructure and basic amenities

Rural infrastructure is not only a key component of rural development but also an important ingredient in ensuring any sustainable poverty reduction program.

The proper development of infrastructure in rural areas improves rural economy and quality of life. It promotes better productivity, increased agricultural incomes, adequate

employment, etc.

2.1.5 RURAL AREA SPECIFIC INFRASTRUCTURE

- Water (hand-pumps, well,) and sanitation (sewerage, drainage, solid waste disposal)
- Power (electricity, street lighting)
- Transport (access road, internal roads, bus station & transport means)
- Communications (post & telegraph offices, public telephone, internet kiosk)
- Education, (nursery school, primary school, high school etc)
- Medical facilities (dispensary, health centre, veterinary centre)
- Community facilities (police post, fire, multipurpose/community centre, Panchayat Ghar, Anganwari, Dharamshala/ Barat Ghar, cemetery, cremation ground, burial ground)
- Recreational (parks & playgrounds, sports complex)
- Commercial (dairy, convenient shops, service shops, market, cooperative/agro banks)
- Religious (temple, mosque, Gurudwara etc.)
- Fair price shop

2.1.6 NEED OF RURAL INFRASTRUCTURE

- Two fifths of the rural Indians have no access to and/or are in no position to afford even basic infrastructure.
- Government has launched several programs for rural development like command area development ,special area development, minimum needs program, and many other poverty alleviation programs but physical & social infrastructure –roads, power, markets and storage facilities are most important for overall development
- Provision of rural infrastructure is prerequisite for self-reliance and development of rural areas

- Infrastructure and rural services are also central to agricultural and rural development.
- They expand opportunities for growth and make growth more diffused and equitable.
- Without proper infrastructure-physical and social like roads, electricity, water and sanitation, education neither the rural areas can contribute towards overall economy (by agriculture and allied activities and others) nor can become self-reliant.

2.1.7 ROLE OF DIFFERENT INFRASTRUCTURE

A) TRANSPORT

- Necessary for marketing of agricultural commodities and making raw materials available in centers of industrial activity
- Facilitates movement of agriculture produce to the market and fetches better price to farmers
- Purchasing of pesticides, fertilizers, better seeds-farm equipments becomes easy
- Increases agriculture production

B) POWER

- It supplies mechanical power for running tube-wells, pumping sets, threshers and chaff-cutters
- Modern facilities and innovations -linked to electricity-not only make life comfortable but also increase productivity in all economic activities
- For high yielding varieties of seeds /better crops etc. experts recommend controlled irrigation that is possible through tube wells and water-pumps-requirement of electricity
- Electricity has transformed rural economy in Tamil Nadu, Punjab, and Haryana.
- Besides contribution to agriculture it also contributes towards rural industrialization, power looms, electronic units etc.

C) MARKETS AND STORAGE

- Application of modern technological innovations in agriculture and industrial production cannot be sustained without proper marketing system.
- Required for agricultural products
- Inadequate and inefficient storage causes heavy losses to producer-wastage of commodities
- Storage facility needs to be planned-to keep transportation costs minimal-requires careful study of cropping pattern, existing communication system and markets in the area.

D) HEALTH

- Provision of health and sanitation facilities has significant effect on rural population
- Diseased, unfit and sick individuals cannot contribute towards any development process - neither agriculture, construction nor any service.
- Motivation and awareness of villagers towards small family norms

E) EDUCATION

- Knowledge of new technology- increases agriculture production
- Increase employment opportunities
- Increases awareness about world and real life scenarios, evils like bonded labor, chains of money lenders etc.
- Better contribution towards economic development of country

F) RURAL HOUSING

- Housing creates lot of employment opportunities
- Optimum use of local and indigenous technology and resources leads to saving of energy
- Has greater impact on standard of living, health, and way of life.

2.1.8 APPRAISAL OF GOVERNMENT SCHEMES

- Evaluations of schemes is carried out by the government; no regular studies, too much dependence on studies conducted through external agencies (no authenticity of data), little or no corrective measures
- Before evaluation of a certain program/ scheme is over - next program gets launched, afresh and without reference to possible lessons learnt through a thorough evaluation of a previous program
- The expenditure on development was meager in earlier plans
- Rural development work meant development of certain items only - number of wells sunk or repaired, supply of irrigation or drinking water, the supply of seeds or fertilizers, manure pits dug ,starting of rural credit societies etc- basically agriculture
- No separate address of rural infrastructure
- No detailed layout of outlays for infrastructure facilities in rural sector
- Address of bigger areas and neglect of smaller issues -Third plan aimed at development of infrastructure facilities at a mage scale but in metropolitan areas -Bombay, Madras, New Delhi, and Calcutta only.
- In 1957, about 29 per cent of rural habitations and about 17 per cent of the rural population were not served by any school.

2.1.9 INFERENCE

- Lack of or inadequate basic infrastructure, both social and physical, continues to remain a major constraint to progress in numerous villages and their habitations.
- Rural systems are still way underdeveloped despite 50 years of aforesaid Rural Development efforts

2.2 RECENT INITIATIVES IN RURAL INFRASTRUCTURE DEVELOPMENT

2.2.1 BACKGROUND

A) DR. A.P.J. ABDUL KALAM, honorable president of india

'There is a need for establishing, in the rural areas, the GRIDs namely

- Knowledge grid,
- Health grid,
- E-governance grid
- PURA (Providing Urban Amenities In Rural Area) grid.

This interconnecting grid will be known as societal grid, which is very vital by all constituents of the society for promoting nonlinear growth."

B) THE 2001 REPORT BY TASK FORCE, on knowledge economy of planning commission

"Experience in India has demonstrated that the true handicap suffered by rural areas is poor connectivity and little else. In addition several studies have brought out that rural poverty can be reduced by providing good rural connectivity. This lacuna may be rectified by linking together a loop of villages by a ring road and high quality transport. That transport connectivity creates in those linked villages a large enough market to support a variety of services, which the villages will not be able to do individually.

Thereby, the ring road and the transport service together convert those villages immediately into a virtual town with a market of tens of thousands of people. Such a well-connected rural space (combined with state of the art telecommunication connectivity) will have a high probability of attaining rapid growth ''

2.2.2 BHARAT NIRMAN

A time-bound plan for rural infrastructure by the Government of India in partnership with State Governments and Panchayati Raj Institutions (2005-2009)

Under Bharat Nirman, action is proposed in the areas of irrigation, road, rural housing, rural water supply, rural electrification and rural telecommunication connectivity. Specific targets have been set to be achieved under each of these goals, within stipulated period, so that there is accountability in the progress of this initiative.

Table 2.1: Status of infrastructure in rural India

S.No.	Infrastructure	Status
1	Irrigation	40 M. Ha. still to be provided irrigation
2	Drinking water	▪ 55,067 uncovered habitations ▪ 2.8 Lakh slipped back ▪ 2.17 Lakh water quality affected
3	Housing	Housing shortage in 2005-06 is 128 Lakh, Increasing at 9 Lakh per year
4	Electrification	1,25,000 villages and 7.78 Crore (56.5%) rural households un electrified
5	Roads	1.34 Lakh habitations to be covered
6	Telephone	66,822 villages to be provided village public telephone

Source: *www.bharatnirman.gov.in*

Table 2.2: Year wise infrastructure targets in Bharat Nirman project

Component	Total	2005-06	06-07	07-08	08-09
Irrigation Capacity	10 M. Ha.	1.90	2.40	2.85	2.85
Drinking Water	55,067 habitations	11,897	18,120	25,050	
Housing	60 Lakh units	14.41	15.33	15.26	15.00

Electrification	1,25,000 villages and 2.3 Crore households	10,000	40,000	Program approved only for 2 years	
Roads	66,802	7,034	16,130	20,071	23,567
Telephone	66,822	11,905	20,000	34,917	—

Source: *www.bharatnirman.gov.in*

A) TASKS

Irrigation

Goal - 10 million hectares (100 Lakh) of additional irrigation capacity to be created by 2009

Table 2.3: Irrigation targets in Bharat Nirman project

S.No.	Component	Target
1.	Completion of ongoing Major & medium Irrigation Projects	4.2 M.Ha
2.	Minor irrigation schemes	2.8 M.Ha
	• Surface water	1.0 M.Ha
	• Ground Water	1.8 M.Ha
3.	Enhancing utilization of completed projects	2.0 M.Ha
	• ERM of major & medium projects	1.0 M.Ha
	• Repair, renovation and restoration of water bodies/ERM of minor irrigation schemes.	1.0 M.Ha
4.	Ground water development in area with unutilized ground water potential (for benefit of small and marginal farmers and Tribal & Dalits)	1.0 M.Ha
	TOTAL	**10.0 M.Ha**

Source: *www.bharatnirman.gov.in*

Drinking Water

Goal - Every habitation to have a safe source of drinking water

55,067 uncovered habitations to be covered by 2009. In addition all habitations, which have slipped back from full coverage to partial coverage due to failure of source and which have water quality problems, to be addressed

The Ministry of Rural Development, Department of Drinking Water Supply has the responsibility in partnership with state governments, under centrally sponsored program of 'Accelerated Rural Water Supply Program' under implementation since 1972-73, funded on a 50% matching share basis between the Government of India and the State Government.

Norms - While implementing the Rural Water Supply Schemes, the following norms may be adopted for providing potable drinking water to the population:

Table 2.4: Domestic water supply norms under Rural Water Supply scheme

S.No.	Purpose	Quantity (lpcd)
1	Drinking	3
2	Cooking	5
3	Bathing	15
4	Washing utensils & house	7
5	Ablution	10

Source: *www.bharatnirman.gov.in*

- 40 liters per capita per day (lpcd) for humans to meet the following requirements:
- 30 lpcd for animals in hot and cold desert/ecosystems in 227 blocks of 36 DDP districts

already identified in the States of Andhra Pradesh, Gujarat, Haryana, H.P., J&K, Karnataka and Rajasthan.

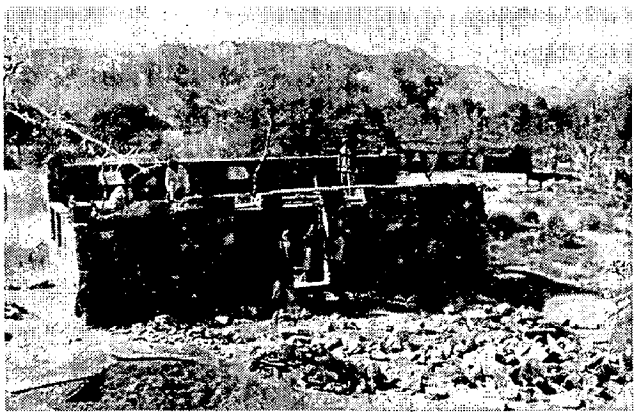
- One hand pump or stand post for every 250 persons
- The water source should exist within 1.6 km in the plains and within 100 Metres elevation in the hilly areas

Management - Habitation survey for the categories of uncovered villages, slipped- back villages and villages affected with a problem of water quality.

Slipped- back villages are so on account of a number of factors like

- Sources going dry or lowering of the ground water table
- Sources becoming quality affected
- Systems outliving their lives
- Systems working below rated capacity due to poor operation and maintenance
- Increase in population resulting in lower per capita availability
- Emergence of new habitations

Housing



Goal - 60 Lakh houses to be constructed for the rural poor by 2009

The Ministry of Rural Development has the responsibility under the 'Indira Awaas Yojana' launched in 1985-86

Centrally Sponsored Scheme where the cost is shared between the Centre and States on 75:25 basis.

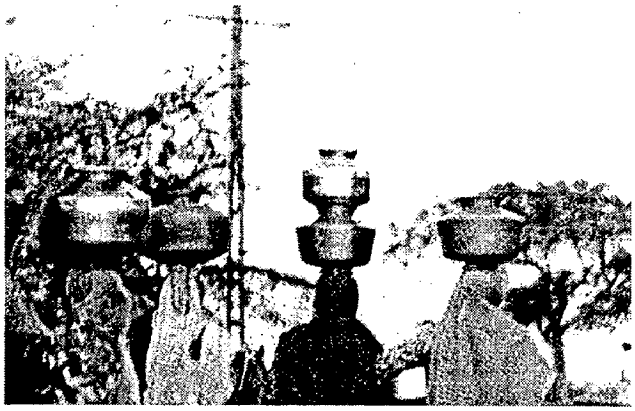
Prioritization - Implementation guidelines of the scheme specifically target

- The rural below poverty line (BPL) households. The respective Gram Sabha does the

selection of beneficiaries from the BPL list and no higher approval is required.

- Physically and mentally challenged persons, ex-servicemen,
- Widows and freed bonded laborers
- SC/ST communities, It is stipulated that at least 60% of the beneficiaries should belong to the community

Electricity



Goal - Every village to be provided electricity - Remaining 1,25,000 (Census of 2001) villages to be covered by 2009 as well as connect 2.3 Crore households

- The Ministry Of Power has the responsibility under the program 'Rajiv Gandhi Grameen Vidhyutikaran Yojana' (RGGVY) launched in April 2005, which aims at providing electricity in all villages and habitations in four years and provides access to electricity to all rural households.

Components Of Infrastructure - To achieve this objective, Rural Electricity Distribution Backbone to be developed with

- at least a 33/11 KV sub-station in each block,
- At least one Distribution Transformer in each habitation of every village or hamlet as Village Electrification Infrastructure,
- Also, Stand-alone grid with generation, where grid supply is not feasible, to be set up in partnership with the Ministry of Non-Conventional Energy.

Norms

- A village will be deemed electrified if the following conditions are met.
- Basic infrastructure such as distribution transformer and distribution lines is provided in the inhabited locality as well as the Dalits basti/hamlet where it exists. (For

electrification through non-conventional energy sources a Distribution Transformer may not be necessary)

- Electricity is provided to public places like schools, Panchayat offices, health centers, dispensaries, community centers, etc. and
- Number of households electrified should be at least 10% of the total number of households in the village".

Management

- Rural Electrification Corporation would be the agency for implementation.
- The Management of Rural Distribution will be franchisees that could be Users Associations, individual entrepreneurs, Cooperatives, Non-Governmental organizations, Panchayat Institutions.
- Services of Central Services undertakings like National Thermal Power Corporation Limited (NTPC), Power Grid Corporation of India Limited (PGCIL), National Hydro Electric Power Corporation Limited (NHPC) and Damodar Valley Corporation (DVC) will be made available for the execution of rural electrification projects.
- These CPSUs have been allocated districts in each state wherein they will implement the rural electrification network.

Prioritization - For creation of village electrification infrastructure, first priority will be given to

- Non-electrified villages.
- Preference for electrification will be given to Dalit Bastis, Tribal settlements and habitations of weaker sections.

Roads

Goal - Every habitation over 1000 population and above (500 in hilly and tribal areas) to be provided an all-weather road

Remaining 66,802 habitations to be covered by 2009.

The Ministry Of Rural Development has the responsibility under the program 'Pradhan Mantri Gram Sadak Yojana' (PMGSY) launched in 2000, which has been modified to address the above goals within the stipulated time-frame

Magnitude Of The Task

- 1,46,185 Kms. road length is proposed to be constructed by 2009.
- This will benefit 66,802 unconnected eligible habitations in the country. To ensure full farm-to-market connectivity,
- It is also proposed to upgrade 1,94,132 Kms. of the existing Associated Through Routes.

Management

- Formulation of District Rural Roads Plan listing out complete network of all roads in the district that has village roads, major district roads, state roads and national highways
- Consultation, with public representatives, ranging from the Panchayat level up to Parliament.
- A Rural Roads Manual to guides the implementation & a Book of Specification and a Standard Data Book to enable standard bidding documents
- Computerized Online Management and Monitoring Accounting System.

Telephone

Goal - Every village to be connected by telephone

remaining 66,822 villages to be covered by November 2007

The Department of Telecom in the Ministry of Communications and Information Technology has the responsibility

Village Public Telephones (VPTs) to be provided on satellite and other technologies

Additional Incentives - Telecom service providers to penetrate into the rural areas for the following activities:

- Maintenance of existing village public telephones (VPTs).
- Provision of an additional rural community phone in villages with a population of more than two thousand and where no public call office exists.
- Replacement of village public telephones installed on Multi Access Radio Relay (MARR) technology.
- Telephone lines installation in household in specified rural areas.

Knowledge Connectivity

The Government is committed to expanding rural connectivity through a slew of measures so that rural users can access information of value and transact business. This will include

- Connecting block headquarters with fiber optic network,
- Using wireless technology to achieve last mile connectivity
- Operating information kiosks through a partnership of citizens, Panchayats, civil society organizations, the private sector and Government.

B) ISSUES COMMON TO ALL COMPONENTS OF BHARAT NIRMAN

While the agenda is not new, the effort here is to impart a sense of urgency to these goals, make the program time-bound, transparent and accountable.

- States to provide required funds as per sharing formula of the scheme to utilize central allocation fully.
- Monitoring at Centre by Ministries, Planning Commission, and Committee on Rural Infrastructure chaired by Prime Minister.
- States to strengthen field reporting and monitoring systems to ensure full data capture.
- On line monitoring system for Bharat Nirman has been web hosted by Ministries (www.bharatnirman.gov.in). States should regularly update the progress on monthly basis by 15th of following month. Verification on quarterly basis.
- Independent agencies to be involved in monitoring and verification.

2.2.3 SMART VILLAGE PROJECT

A) INTRODUCTION

The project came out of the need to empower the people by enriching them with information and enhancing their capacity to communicate with one another and with the rest of the world. Such empowerment, if achieved, can truly strengthen the other development efforts.

To complement it, recent developments in Information and Communication Technologies (ICTs) have introduced a plethora of opportunities for development in every conceivable area

NIC proposed the 'smart village project' as part of its Xth Plan (2002-07). The smart village Project has been approved under the Xth Plan and an amount of Rs. 2 Crore has been allocated under the budget. The project is presently in the initial stage of detailed conceptualization and planning

B) THE NEED

Rural areas and the people living there face certain unique challenges that are not faced by their urban counterparts. The major ones include

- Physical remoteness & Lack of digital infrastructure
- unstructured and unorganized sector
- Illiteracy & Inability to access and use content in English language
- are information poor and service poor
- Lack of adequate skill to use and maintain the latest technologies

C) OPPORTUNITIES OFFERED BY THE ICT's.

- Can reduce time & space boundaries.
- Have a tendency to standardize, organize, streamline, & integrate
- Helps in bridging the divide between the illiterate and the literate though it's multiple media and multiple modes of interaction with its users.
- Offer tremendous potential as an effective vehicle for information dissemination and service delivery through its capabilities to reach out to a vast majority of people through wired and wireless technologies.

D) VISION

To develop and empower Indian villagers by making them part of the evolving knowledge society

E) OBJECTIVES

- Introduce & promote Information and Communication Technologies (ICTs) that are cost effective and appropriate for use in rural areas.
- Building, maintaining and delivering the information and knowledge base to facilitate development and empowerment of the village community.

- Explore & strengthen avenues to make the service model self-sustainable at village level.
- Ensuring civil and electrical infrastructure availability.
- Encouraging villagers to use the ICT infrastructure to:
  - Access information service related resources
  - Actively participate in building the local knowledge base
  - Voice their opinion on issues relevant to them
  - Learn new skills
  - Communicate with people within and outside their villages
  - Communicate their needs to governments at various levels

2.2.4 PURA

A) INTRODUCTION

- Announced by The President on the eve of 57th Republic day of India, 2003
- Aims at providing amenities similar to urban areas to the rural people
- Cluster based approach, to identify clusters of villages around small towns (population 20,000 to I lakh) for this program. Integrating minimum 8 to 10 villages of the same 60 km2 area
- In the first phase of its implementation, the villages within 5-10 km around these towns to be selected.
- PURA is to be implemented in 4,130 rural clusters across the country in the next five years
- Each PURA complex, a network of villages connected over 60 Kms, would be self-sustaining with industry, educational institutions and other amenities and entail an investment of Rs.100 Crore.
- Creating following types of connectivity within them:

- Physical connectivity
- Electronic connectivity
- Knowledge connectivity
- Economic connectivity

B) CONNECTIVITY

Physical Connectivity

- To improve the existing roads & transportation link thereby ensuring
  - Safe & fast movement of people and goods.
  - saved transportation time and substantial costs cuts
  - access to outside market and processing centers
  - Improved access to schools and health care centers,
  - Increased job opportunity
  - Reduced investment in distribution of power, water & communication network
- To develop health infrastructure, ensuring a healthy life to the villages.
- To improve Power infrastructure enabling improvement in input and output of livelihood
- To improve other physical infrastructure like education

Electronic Connectivity

- To establish mass communication systems such as telephone, community radio, internet etc., ensuring the latest information exchange.
  - Making the people aware of daily market rate for their products, weather, Agri information, Government schemes and latest technology that could be adopted.
  - Making the villagers interact with experts on agriculture, doctors and other officials.
  - reducing time-wastage due to bureaucracy
- To setup Village Internet kiosks for -

- E-Government access
- E-market access
- E-Banking/ ATM centers
- Tele-Training on farming
- Tele-education

Knowledge Connectivity

- To establish need based education and enable all the villagers including children to learn & improve literacy
- To offer training and guidelines to the villagers, to do cultivation and allied professions intensively.
- To offer IRS Imagery for
  - Land & Crop Mgmt
  - Water Mgmt
  - Forest Mgmt
  - Environment
- To apprise the villagers about various government schemes and employment opportunities through electronic connectivity

Economic Connectivity

- To create job awareness by providing training on entrepreneurship and handicrafts.
- To provide opportunities for marketing the products of agriculture and allied professions imparting technical skills.
- To undertake developmental activities instilling the concept of saving and utility.
- To encourage the villagers to involve in simple new and profitable business.

C) CLASSIFICATION OF PURA CLUSTERS

- Type A - situated closer to an urban area and having minimal road connectivity, limited

infrastructure, limited support - school, primary health centre.

- Type B - situated Closer to urban area but has sparsely spread infrastructure and no connectivity,
- Type C - located far interior with no infrastructure, no connectivity and no basic amenities.

D) STRUCTURE PLAN

Structure plan under PURA take care of utility infrastructure: water supply, sewerage, drainage, low cost sanitation, power, transport, solid waste management, etc.

Social Infrastructure: Health, Education, Community Halls, Parks, Play Grounds, etc.

Commercial Infrastructure: Shopping Centre, Markets, Theatres, Trade Centre, etc.

2.2.5 INFERENCE

- There is urgent need of provision of urban infrastructure in rural areas
- Of which physical & electronic connectivity is an essential & integral part.
- The formation of cluster of rural settlements, which acts as a viable planning unit is a viable solution.
- Such Model of establishing a circular connectivity among the rural village complexes will accelerate rural development process

3. CASE STUDIES

3.1 CASE STUDY I - NATIONAL CAPITAL TERRITORY, DELHI

3.1.1 INTRODUCTION

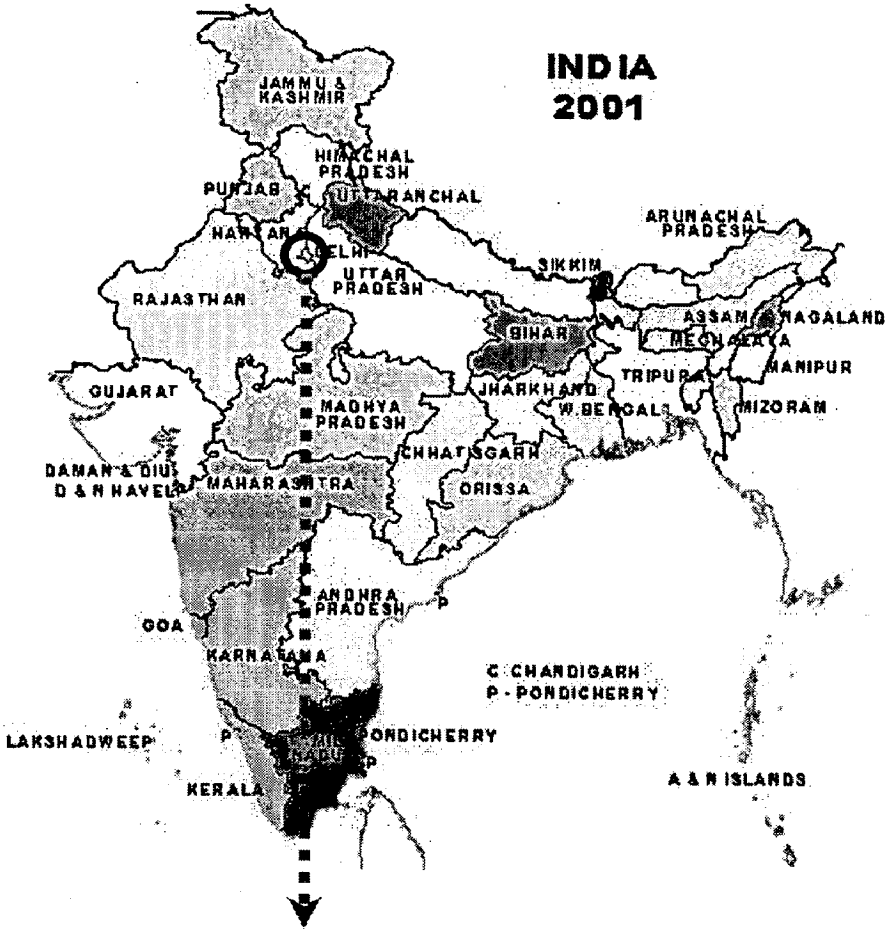
Delhi is the capital of the country and also the biggest business centre of Northern India. Five national Highways (NH-1, NH-2, NH-8, NH-10 and NH-24) converge on Delhi's Ring Road. It is also a major junction on the rail map of India.

3.1.2 LOCATION

The national capital territory of Delhi is situated between the Himalayas and Aravalis range in the northern part of India, at Coordinates 28.38° N 77.12° E, surrounded by Haryana on 3 sides and on the east, across the river Yamuna by Uttar Pradesh. The major part of the territory lies on the western side of the river Yamuna, except some villages and the urban area of Shahdara

Of the four major Indian metropolitan cities, Delhi is the least densely populated, least urbanized and covers the largest geographical area.

Map 3.1: Location of NCT, Delhi in India



Source: *www.mapsofindia.com*

Map 3.2: NCT Delhi

Source: *www.mapsofindia.com*

3.1.3 CLIMATE

The average annual rainfall in the territory is 612 mm. Maximum rainfall occurs in July.

Monthly mean temperatures range from 14.3°C in January (minimum 3°C) to 34.5°C in June (maximum 47°C).

Northwesterly winds usually prevail; however, in June and July southeasterly predominate.

3.1.4 TOPOGRAPHY

The river Yamuna flows from north to south. A hard rocky ridge runs from the southern border of NCT in a south-west to north-east direction, towards the western banks of the river Yamuna.

The eastern low-lying side of Delhi was originally part of the flood plain of the River Yamuna and considered uninhabitable. Today, however, this eastern part, known as the trans-Yamuna area, houses about 20% of the total population of Delhi

3.1.5 DEMOGRAPHY

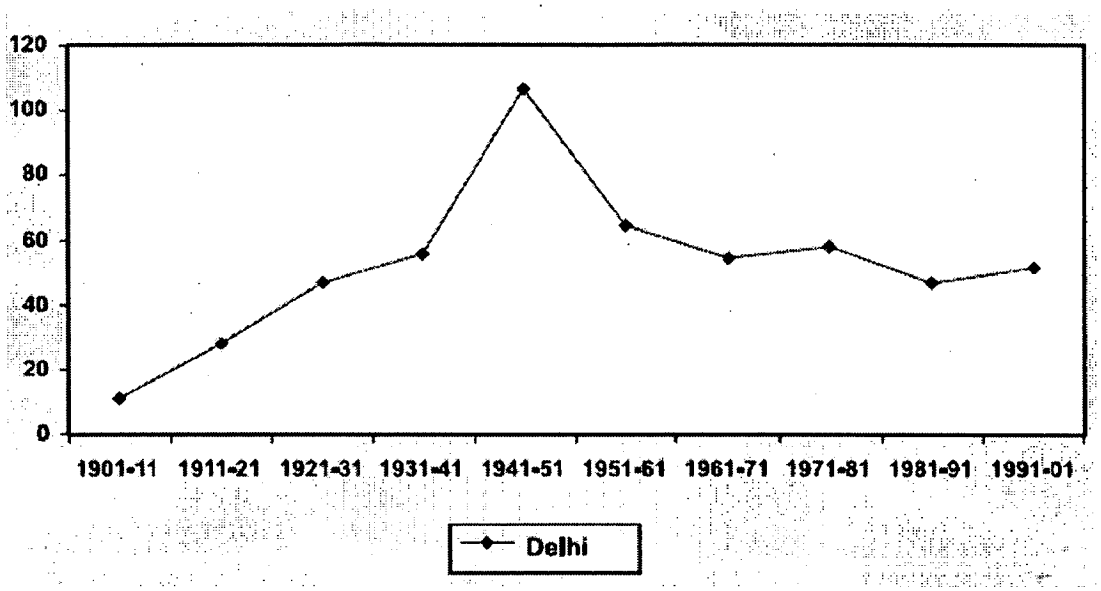
Table 3.1: Demographic profile, NCT Delhi

Area	1,483 KMS
Rural Urban	558 sq. km. (37.63%) 925 sq. km. (62.37 %) 685 sq. km. (1991)
Languages	Hindi, Punjab and Urdu
Population	1,37,82,976 (2001 census) 94,20,614 (1991 census)

Rural	9,63,215
Urban	1,28,19,761
Decadal Growth 1991 - 2001	46.31 %
Density	9,294/Km
Literacy	81.82%

Source: *Economic Survey Of Delhi, 2005-2006*

Fig 3.1: Decennial growth in urban population, NCT Delhi

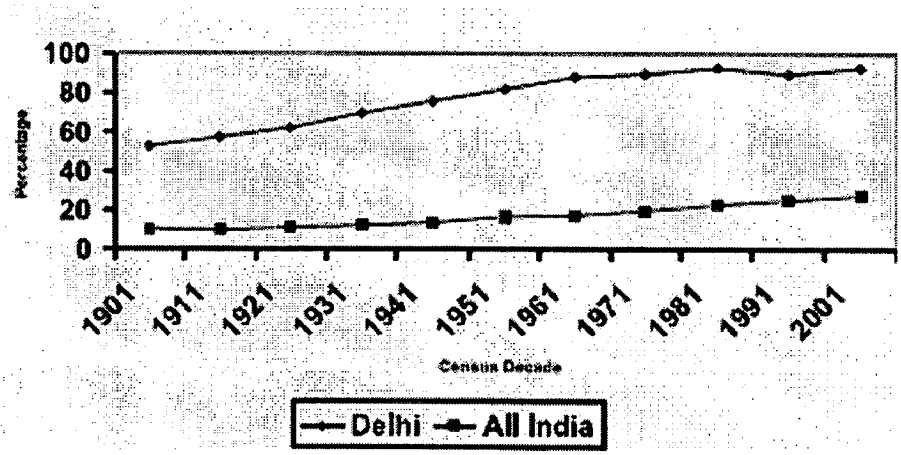


Source: *Economic Survey Of Delhi, 2005-2006*

- Delhi was a small town in 1901 with a population 0.4 million. Delhi's population started increasing after it became the capital of British India in 1911, to reach a population of .92 million in 1941
- During the Partition of the country, a large number of people migrated from Pakistan and settled in Delhi. raising the population from 920,000 in 1941 to 1.74 million in 1951, registering a decadal growth of approximately 90%
- Migration into the city continued even after Partition. The 2001 Census recorded 138.51 lakh population of Delhi with 3.85% annual growth rate and 47.02% decennial growth rate during 1991-2001.

- As the country's capital, with vibrant trade and commerce and excellent employment opportunities, Delhi has attracted people from all over the country
- It is revealed that only 0.21 million persons were living in urban areas in 1901 and it increased to 12.82 million in 2001. In terms of percentage, urban population was 52.76% in 1901 and it rose to 93.18 % in 2001. It shows that fast urbanization has taken place in the capital city.
- With the rapid pace of urbanization the rural area of Delhi is shrinking. The number of rural villages has decreased from 314 in 1921 to 165 in 2001 census. The percentage of rural population of Delhi has also declined from 47.24% in 1901 to 6.99% in 2001.

Fig 3.2: Trends of urbanization in India & NCT Delhi



Source: *Economic Survey Of Delhi, 2005-2006*

- The population of Delhi is becoming denser, increasing from 4,200 inhabitants/sq. km. in 1981 to about 6,352 inhabitants/sq. km. in 1991. The census of 2001 implies an average density of 9340 inhabitants/sq. km.

3.1.6 TOWNS AND VILLAGES

The NCT was set up as a federally administered Union Territory on -11-01-1956. There are three local bodies namely, Municipal Corporation of Delhi New Delhi Municipal Committee and Delhi Cantonment Board

In Delhi, there are 8 community development blocks comprising of 165 rural villages. There are close to 135 urbanized villages in Delhi. Bodies providing for civic supplies and infrastructure

- Municipal Corporation (MCD)
- Irrigation Department
- Electricity Board (DVB)
- Water Board (Jal Board)
- Sewerage Board
- Public Works Department (PWD)
- Public Telephone Company (e.g. MTNL)

3.1.7 PRESENT SCENARIO

Possibility of finding jobs in Delhi has attracted a large number of migrants into the city

A majority find employment in the unorganized sector (Trade, hotels, and restaurants manufacturing sector, Construction). A large percentage of the migrants have been flocking into the rural periphery within and beyond NCT, as access to land and basic services within the central areas of the city have become increasingly difficult.

Migrants move to the relatively inexpensive fringe areas of cities, where clusters of slums are emerging. These environments are characterized by poor sanitation, lack of water and electricity services, and substandard housing. Simultaneous Urban expansion is also occurring at the expense of agricultural land in the rural-use zones.

In the absence of any specific controls and political will, industries came up in a big way in select pockets within the city as well as its immediate hinterland. A large number of informal units, both in manufacturing as in the trading sector, came up mostly in residential areas, The Court (in civil writ petition no. 4677/85) passed a directive for immediate closure of these industries and shifting.

The move to shift industrial units was not backed by appropriate provisioning of

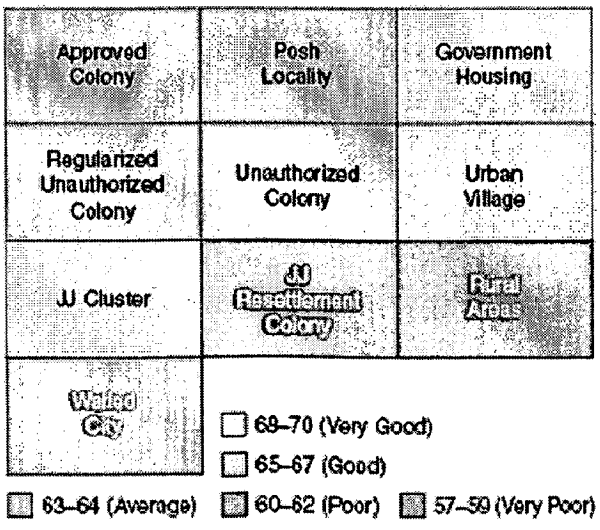
infrastructural facilities and a system of environmental monitoring, the small towns and villages around the metropolitan city thus, emerged as convenient locations for industrial units despite serious infrastructural deficiencies.

In the rural villages typically, a builder or house-owner is not required to get the building plan formally cleared as is the requirement within the urban limits. The unemployment problem has got accentuated with the liquidation of most of the traditional household industries due to the penetration of the city market

It is in these settlements and surrounding vacant lands that a large majority of migrants, who seek employment in central Delhi, have been absorbed, contributing to worsening of the employment situation in these villages, also created tensions between the locals and the immigrants as the local residents lost their traditional jobs but were not able to take advantage of the newly created job opportunities.

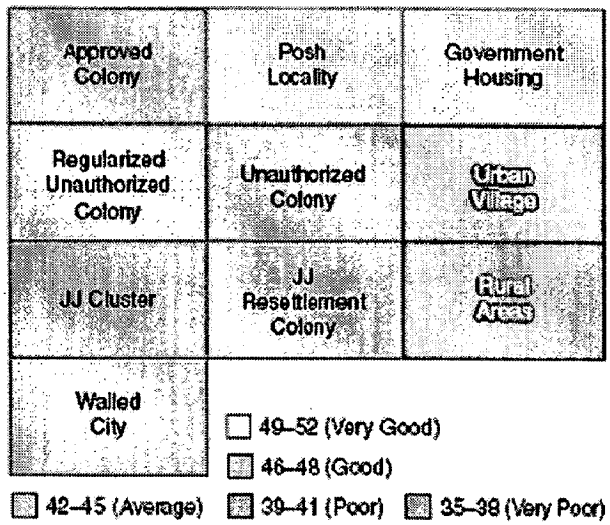
3.1.8 INFRASTRUCTURE CONDITION IN DIFFERENT LOCALITIES IN COMPARISON

Fig 3.3: Rating of public transport facilities in Delhi



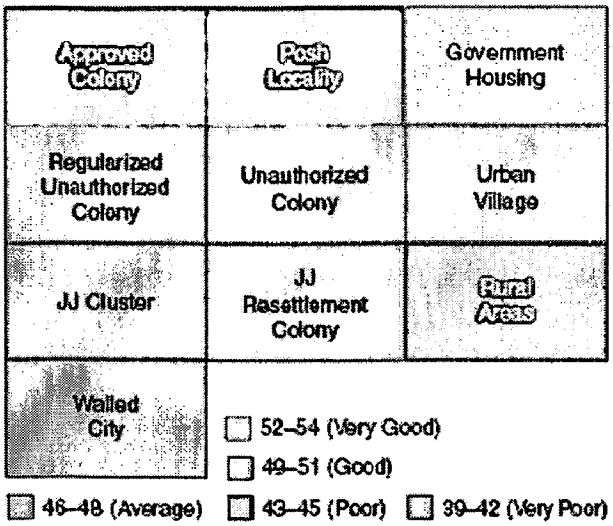
Source: *Delhi human dev. report 2006*

Fig 3.4: Assessment of roads by locality in Delhi



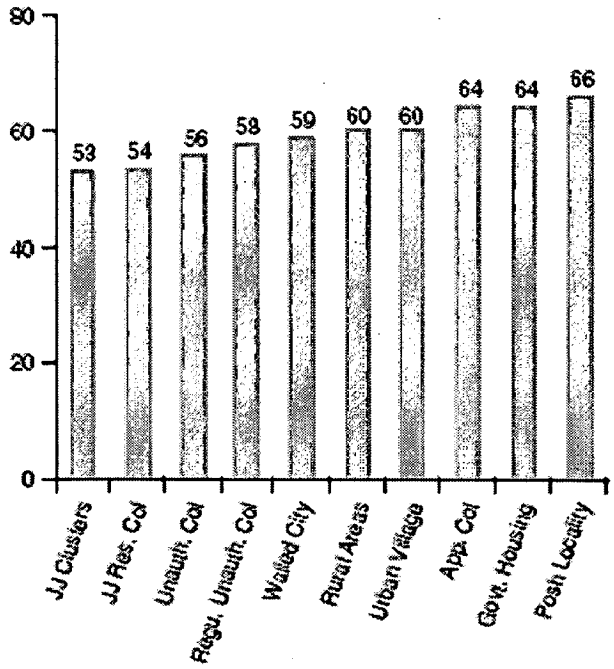
Source: *Delhi human dev. report 2006*

Fig 3.5: Rating of health services availability across localities of Delhi



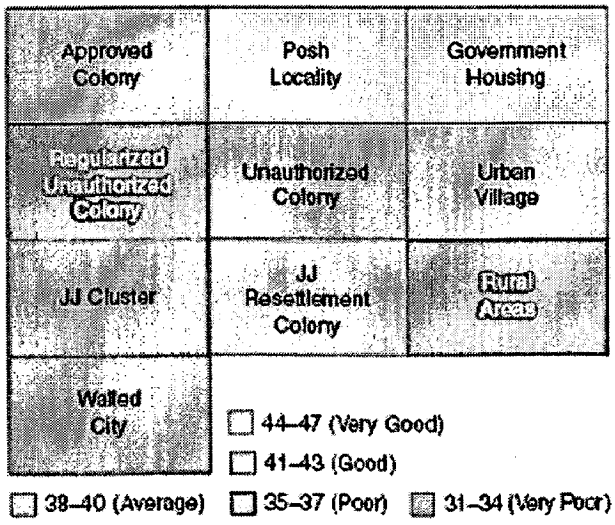
Source: *Delhi human dev. report 2006*

Fig 3.6: Assessment of quality of schools across localities in Delhi



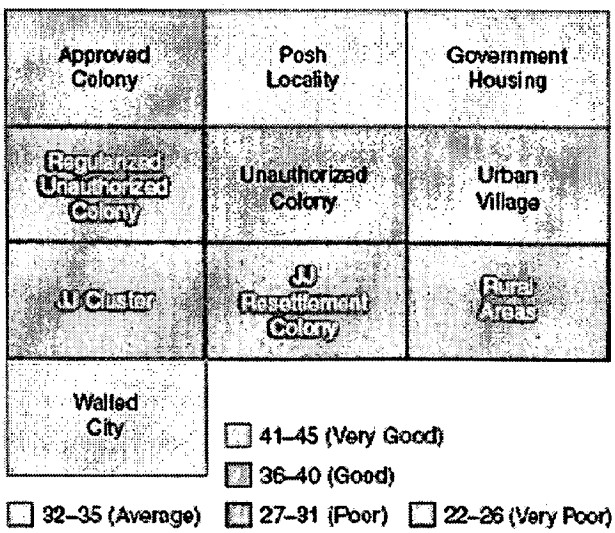
Source: *Delhi human dev. report 2006*

Fig 3.7: Rating of water supply across localities of Delhi



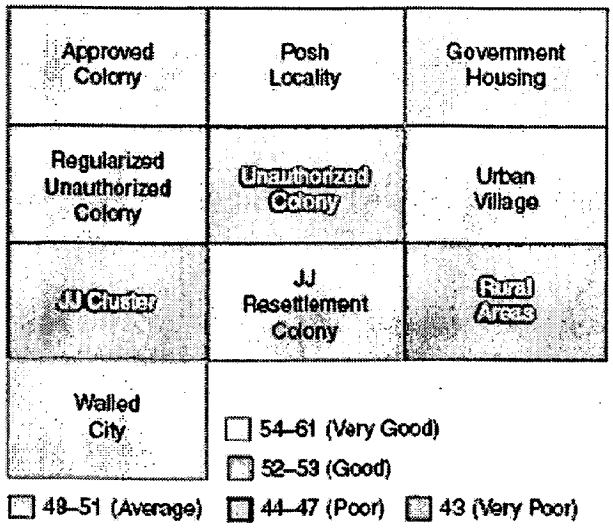
Source: *Delhi human dev. report 2006*

Fig 3.8: Rating of sanitation & garbage disposal services across localities of Delhi



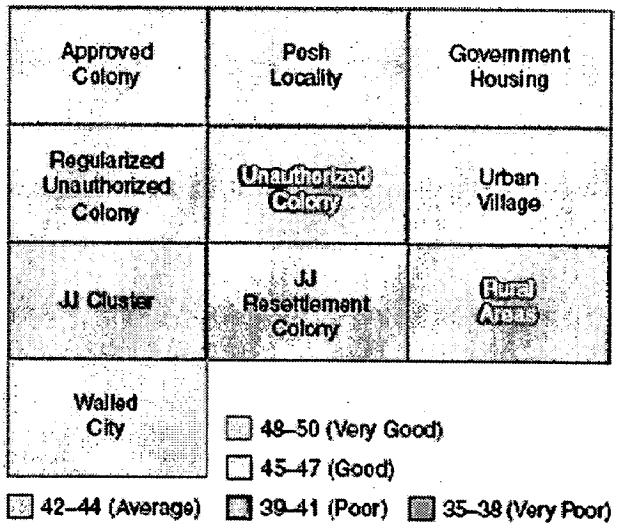
Source: *Delhi human dev. report 2006*

Fig 3.9: Rating of power supply across localities of Delhi



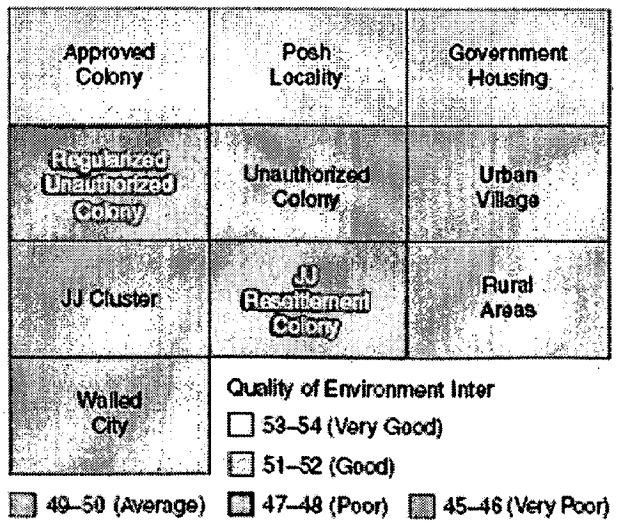
Source: *Delhi human dev. report 2006*

Fig 3.10: Rating of availability of housing across localities of Delhi



Source: *Delhi human dev. report 2006*

Fig 3.11: Quality of environment across localities of Delhi



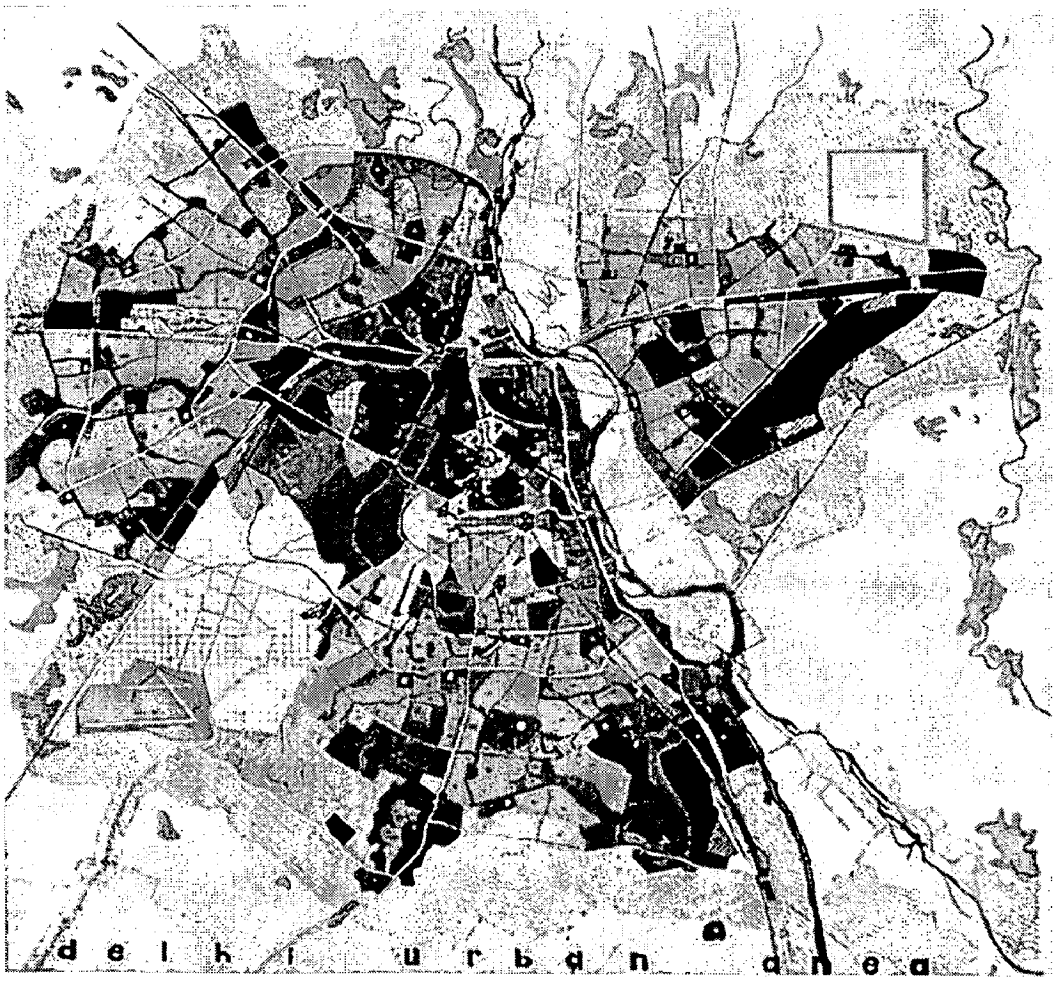
Source: *Delhi human dev. report 2006*

SUMMING UP Fig. (3.3-3.11) JJ resettlement colonies, unauthorized colonies, JJ clusters, and rural areas register lower than state average ratings in aggregate performance ratings (42 to 44 against the average of 46).

3.1.9 RECOMMENDATION IN DIFFERENT MASTER PLANS OF DELHI

A) MPD 1962

Map 3.3: Delhi master plan, 1962



Source: *www.dda.org.in*

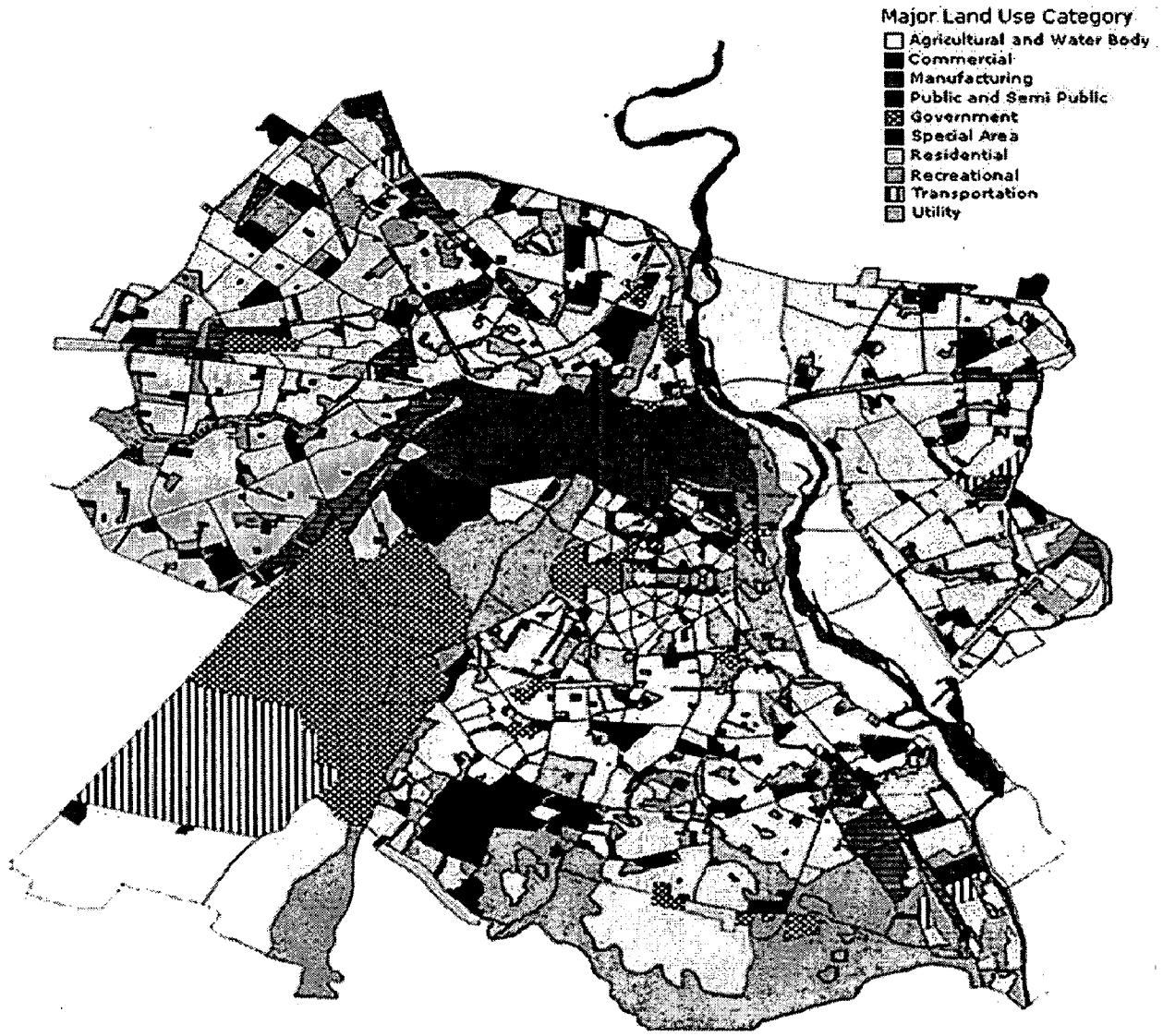
- In 1979-80, Government of Delhi introduced a scheme to improve the civic services in the villages.
- For the development of rural areas outside the urbanized limit, MPD 1962 recommended 8 large division (District Rural Centres) expecting that each DRC will

ultimately be developed into a small rural township by 1981 with each having a population of 7,000-10,000

- Also proposed inner rural zone, also called the green/agriculture belt in the form of 1.6 km wide area around the proposed urban area
- Agricultural belt was subject to protection of its rural character

B) MPD 2001

Map 3.4: Delhi master plan, 2001

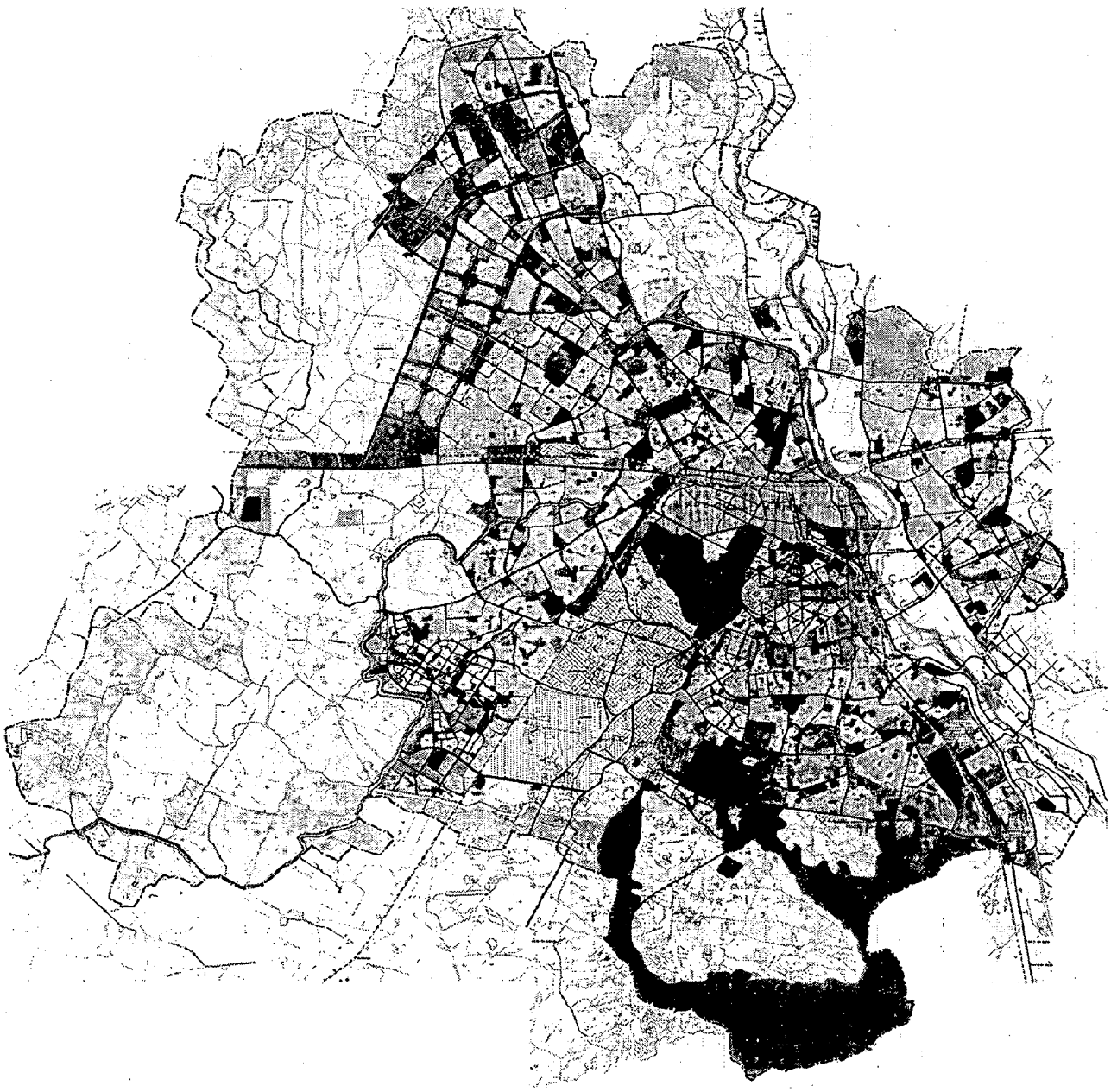


Source: *www.dda.org.in*

- Considerable part of previous green belt was utilized for urban extension
- Green belt of 2 km wide proposed all along the UT

- Proposed for integrated development of rural areas of Delhi
- Construction of physical, social, economic & ecological infrastructure
- Included 195 villages that were divided in 3 tiers to be developed
  - 15 as growth centre
  - 33 as growth points
  - 147 as basic villages

Map 3.5: Delhi master plan, 2021



Source: *www.dda.org.in*

3.1.10 INFERENCE

- Although there is a lot of population pressure on rural areas surrounding a large city but urbanizing the rural areas is not the solution
- There is dearth of level of services in every field in villages which can't cater to the increasing population. the urbanized villages slightly scores over the rural villages in almost all the services but they lag in housing & health
- Besides providing the proper infrastructure considering the future needs, It is important to articulate a clear development regulation & bye-laws in rural villages & also ensure their proper implementation.
- Developing the villages in different level of facilities hierarchy is widely used approach.

3.2 CASE STUDY II-PERIYAR PURA, TAMIL NADU

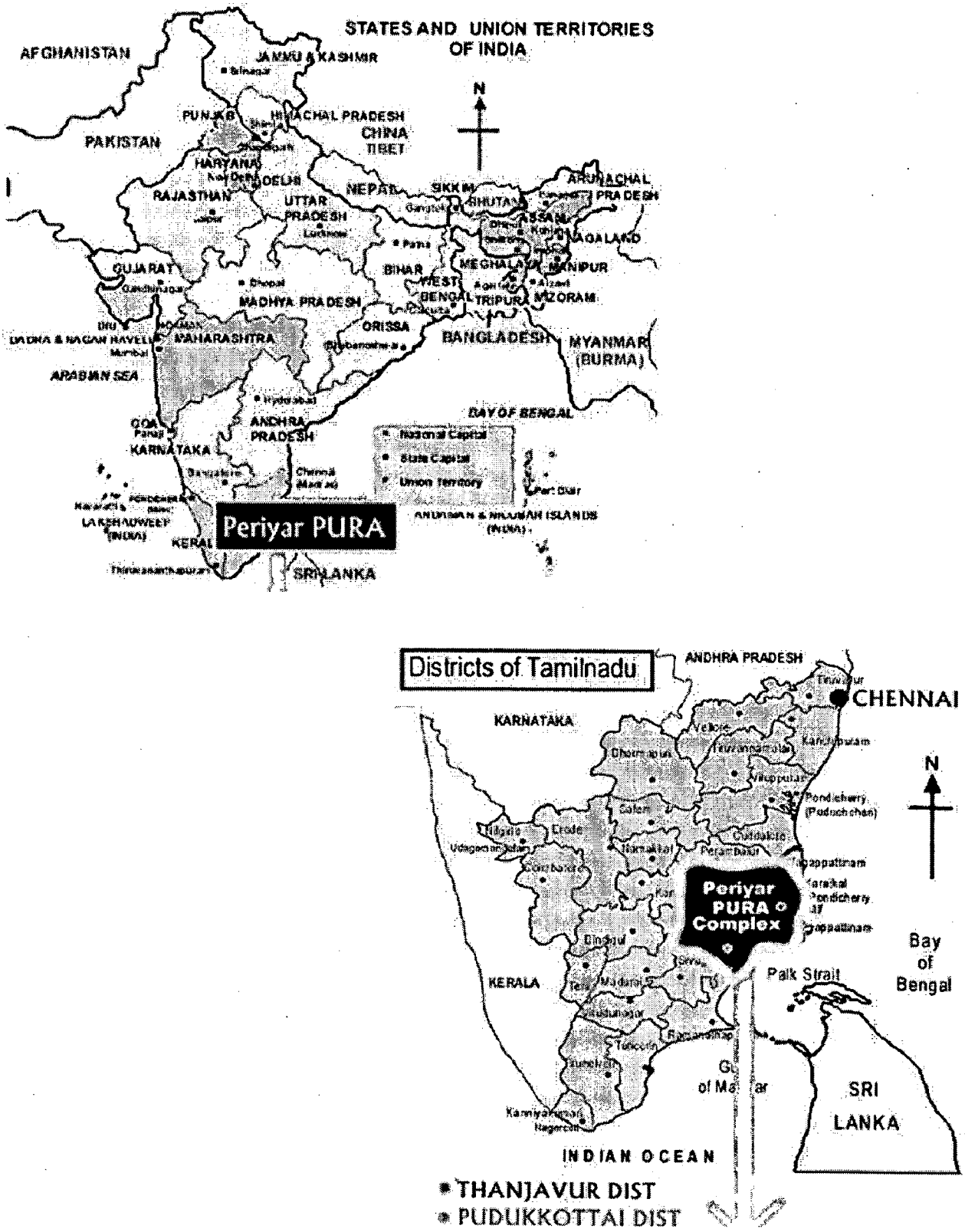
3.2.1 BACKGROUND

'Periyar PURA' scheme covers 57 villages of Thanjavur district and 8 villages of Pudukkottai district. These villages encircle the institution at the radial distance of 22 KM.

This is a rain-fed and drought prone area consisting of abundant land, which is unutilized. As this is predominantly an agrarian region, large-scale industrialization has not taken place and the manpower remains idle. Socioeconomic status of the people remains in an extreme poor condition.

3.2.2 LOCATION

Map 3.6: location of Periyar PURA in India



Source: www.periyarpura.org

3.2.3 VILLAGE CLUSTERS IN PERIYAR PURA

In the 65 Periyar PURA villages 7 are selected as nodal villages and those seven villages are identified as economic cluster in Periyar PURA. The main economic activities of the seven villages are

Table 3.2: Village Clusters based on economic activity, Periyar PURA

S.No.	VILLAGE	ECONOMIC ACTIVITY
1.	Achampatti	Coconut and Coir Products
2.	Boodalur	Alternate Building material
3.	Komapuram	Bamboo Applications
4.	Palayapatti	Medicinal Plants
5.	Rayamundanpatti	Integrated Diary
6.	Vallam	Bio-fertilizer and Bio-energy
7.	Veeramarasanpettai	Food processing

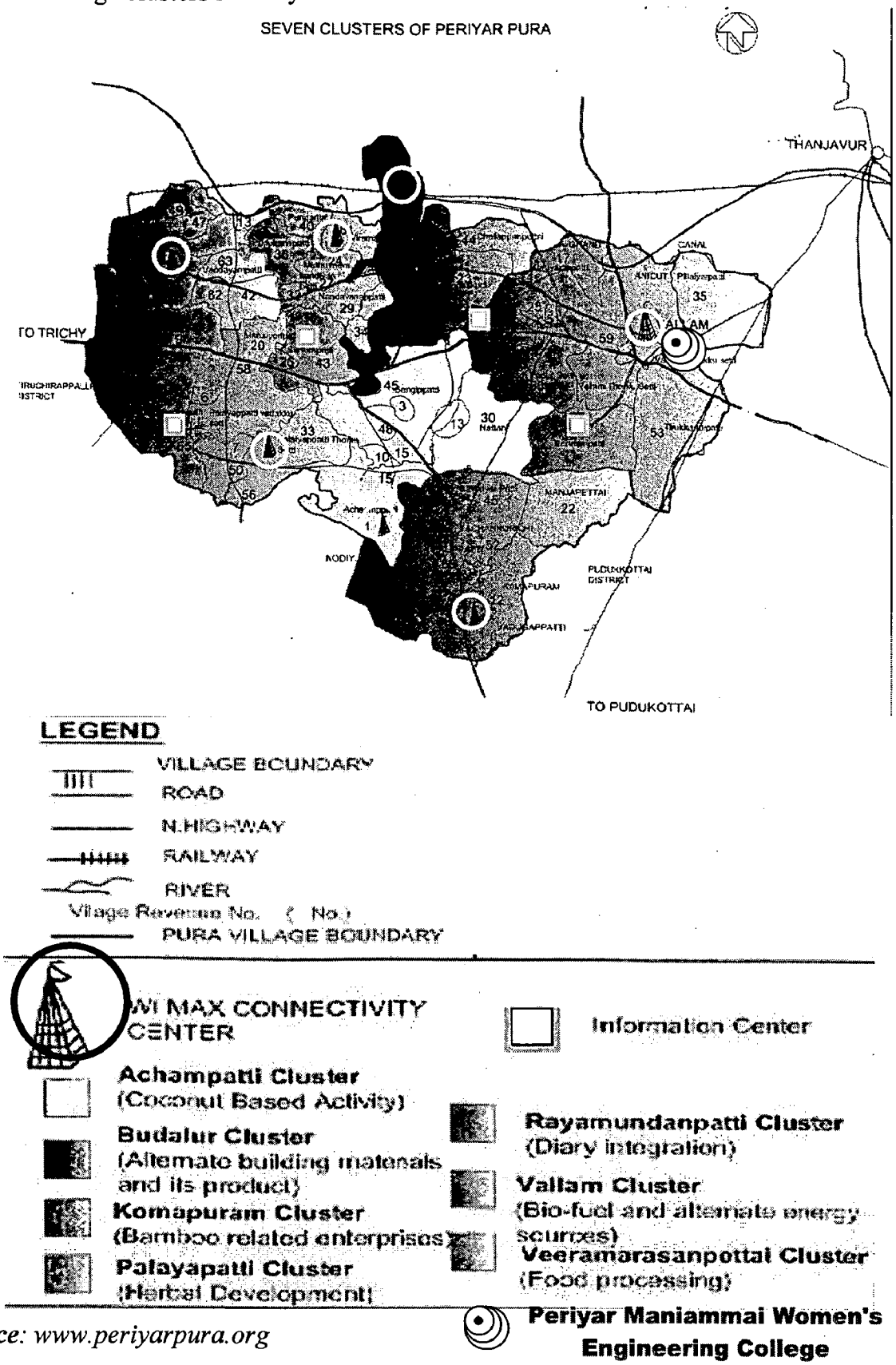
***Source**: www.periyarpura.org*

3.2.4 MAIN FEATURES

- Hub of Periyar PURA is Periyar Maniammai Women's Engineering College, Vallam, Tanjore, TN
- Different clusters performs different activities
- Main physical connectivity is provided between the focal villages
- These also act as knowledge centers for their cluster, through the provision of Internet Kiosk/village knowledge centre (VKC),
- Focal villages are also provided with urban amenities such as
  - school, hospital, Police station
  - Park, theatre, library

- radio, good transport facilities, bus stand
- Stationery and departmental stores, etc.

Map 3.6: village clusters in Periyar PURA



Source: www.periyarpura.org

- Also biomass & solar energy are used for power generation at one of the cluster level
- Further development of six percolation ponds and five check dams to harness rainwater has been done

3.2.5 INFERENCE

- Importance of the cluster formation, providing hierarchy of services like health care centers, primary to post graduate level education and vocational training centers
- The connectivity - physical, electronic and knowledge (village Knowledge Centers are the essential component) should be emphasized upon
- The centre of activity emanates from the women engineering college that provides the electronic and knowledge connectivity.
- Decentralization of infrastructure facilities & setup for alternate energy resources & resource conservation is an integral part of planning

4. STUDY AREA PROFILE

4.1 BACKGROUND

Chandigarh, the dream city of India's first Prime Minister, Sh. Jawahar Lal Nehru, was planned by the famous French architect Le Corbusier. Picturesquely located at the foothills of Shivaliks, it is known as one of the best experiments in urban planning and modern architecture in the twentieth century in India.

Chandigarh derives its name from the temple of "Chandi Mandir" located in the vicinity of the site selected for the city. The deity 'Chandi', the goddess of power and a fort or 'garh' lying beyond the temple gave the city its name "Chandigarh-The City Beautiful".

The city has a pre-historic past. The gently sloping plain, on which modern Chandigarh exists, was in the ancient past, a wide lake ringed by a marsh. The fossil remains found at the site indicate a large variety of aquatic and amphibian life, which was supported by that environment. About 8000 years ago the area was also known to be a home to the Harappans.

Since the medieval through modern era, the area was part of the large and prosperous Punjab Province which was divided into East & West Punjab during partition of the country in 1947. Subsequently, the city was conceived, not only to serve as the capital of East Punjab, but also to resettle thousands of refugees who had been uprooted from West Punjab. In March, 1948, the Government of Punjab approved the area of the foothills of the Shivaliks as the site for the capital. It was built in 1953

Presently the city serves as a capital to both Punjab & Haryana states & is administered by the Central Government and hence classified as a union territory. Since 1986 there has been

much talk about officially handing it to Punjab on the basis of demography. The issue however continues to be a matter of discussion with many political disputes.

Table 4.1: City profile, Chandigarh

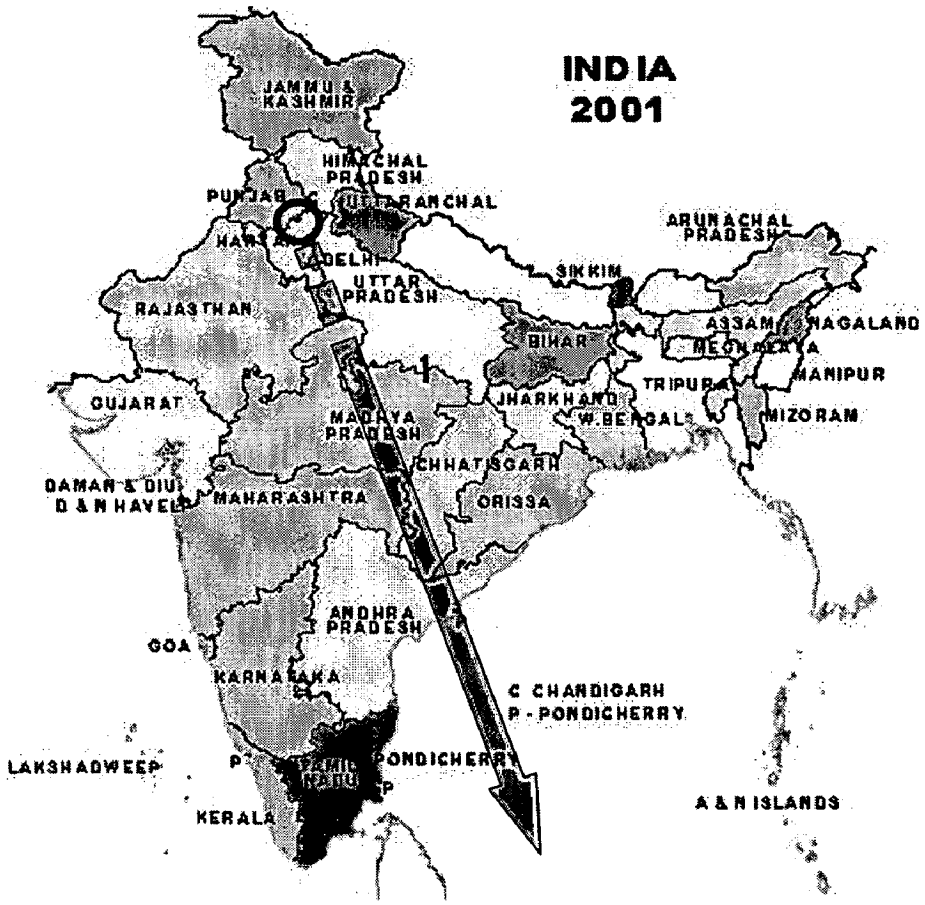
S.No.	Aspect	Value
1.	Longitude Latitude	76° 47' 14E 30° 44' 14N
2.	Altitude	304 – 365 meters above MSL with 1% drainage gradient
3.	Population	9,00,635
4.	Total Area	114 sq. km
5.	Density	7,900 sq. km.
6.	Decennial Growth	40.33% (1991-2001)
7.	Birth Rate	21.95 (per 1000) (2004)
8.	Death Rate	9.37(per 1000) (2004)
9.	Infant Mortality	33.14 (per 1000) (2004)
10.	Sex Ratio	777 (females per 1000 males)
11.	Literacy Rate	81.9%
12.	Annual Rainfall	104.8 cm/year average (April-2004 to March-2005)
13.	Monsoon	July – September
14.	Temperature	Winter Min. (Nov.-Jan.,2005) 3^0C –14^0C Summer Max. (April-July,2004) 31oC – 44^0C
15.	Prevalent Winds	From the North West to South East in Winter and reverse in Summer.
16.	Total Villages	22
17.	urban villages	4
18.	Rural villages	`
Source: *statistical Abstrct-2006, UT Chandigarh*		

4.2 REGIONAL

4.2.1 LOCATION

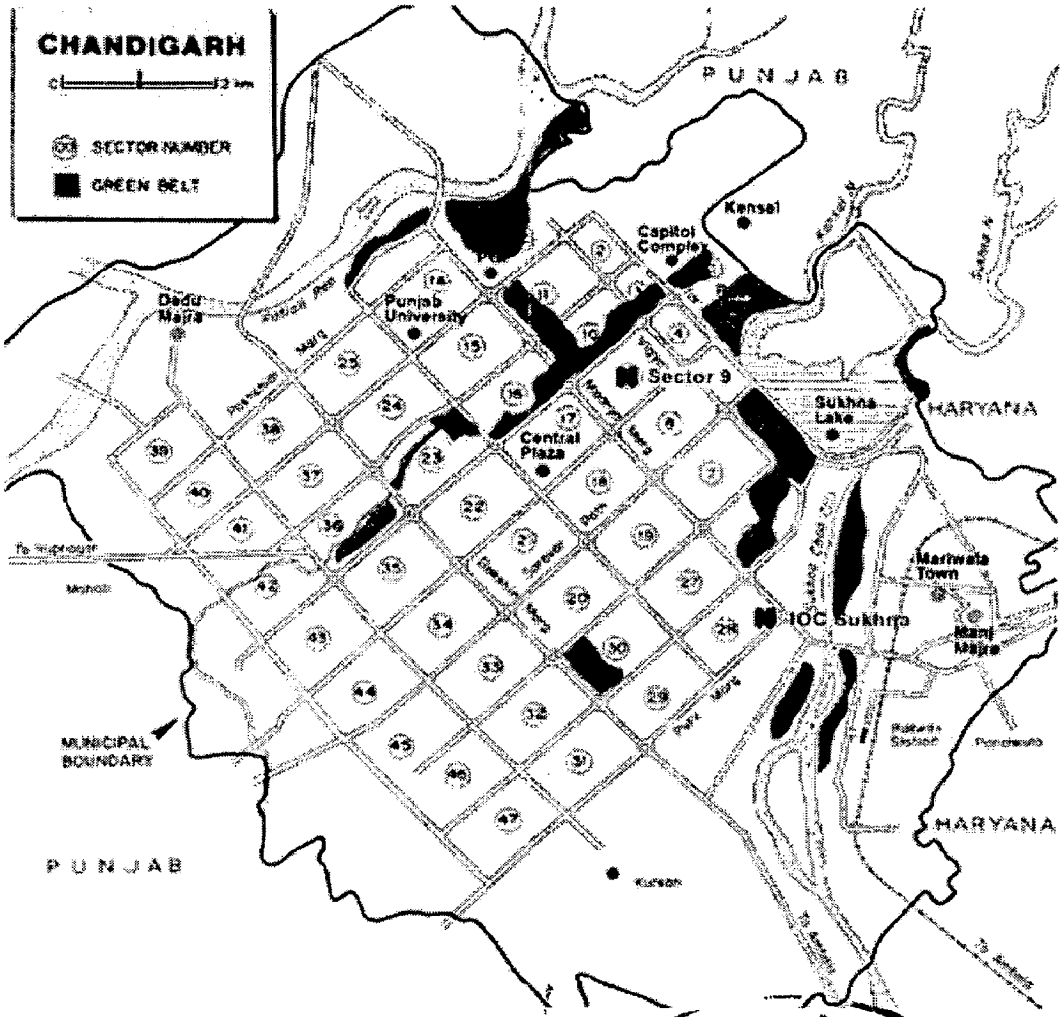
Chandigarh, the capital of Punjab & Haryana state, lies in the north of India on the foothills of the Shivalik hills. It is situated at an altitude of about 365 meters above the sea level at Longitude of 76° 47' 14E & Latitude of 30° 44' 14N. It is enclosed by three states, namely, Punjab, Haryana and Himachal Pradesh. Punjab on north-west, Himachal on north & Haryana on south-east

Map 4.1: Location of Chandigarh in India



Source: *www.mapsofindia.com*

Map 4.2: Chandigarh city



Source: www.chandigarh.nic.in

4.2.2 LINKAGES

Chandigarh is well linked by roads, railways and airways to the rest of the country

By Air: Chandigarh has a domestic airport 11 km away from the ISBT. Jet Airways, Air Deccan and Indian (airline) operate regular flights from Chandigarh to major cities like New Delhi, Mumbai, Jammu and Amritsar.

By Road: The city can boast of an excellent road-network. The two main National Highways (NH) connecting Chandigarh with the rest of the country are: NH 22 (Ambala - Kalka - Shimla - Kinnaur) and NH 21 (Chandigarh - Leh). Chandigarh has two Inter-State

Bus Terminus (ISBT), one for the North, East and South located in Sector 17, which has regular bus services to most major cites in Haryana, Himachal Pradesh, and Uttarakhand, & Delhi. And a second in Sector 43 for the Western section, mainly Punjab, some parts of Himachal and Jammu and Kashmir. It is also conveniently located within motor-able distance from a number of major cities of North India like Delhi at 240, Simla at 110, Ludhiana at 160 km and Kasauli at 77 km.

By Rail: Chandigarh has a small railway station located about 10 km. away from the ISBT. Regular train connections are available to the national capital and to some other junctions like Kalka, Ambala, Amritsar, Bhiwani, Howrah, and Sri Ganganagar.

4.2.3 TOPOGRAPHY & CLIMATE

A) TOPOGRAPHY

The Union Territory of Chandigarh is located in the foothills of the Shivalik hill ranges in the north, which form a part of the fragile Himalayan ecosystem. It is occupied by Kandi (Bhabhar) in the north east and Sirowal (Tarai) and alluvial plains in the remaining part. The subsurface formation comprises of beds of boulders, pebbles, gravel, sand, silt, clays and some kankar. The area is drained by two seasonal rivulets viz. Sukhna Choe in the east and Patiala-Ki-Rao Choe in the west. The central part forms a surface water divide and has two minor streams. The stream passing through the central part is called N-Choe and the other is Choe Nala which initiates at Sector 29.

B) CLIMATE

Chandigarh falls under Koeppen's Cwa category i.e. it has cold dry winter, hot summer and sub tropical monsoon. Evaporation usually exceeds precipitation and the weather is generally dry. The area experiences four seasons:

- Summer or hot season (mid-March to Mid-June)

- Rainy season (late-June to mid-September);
- Post monsoon autumn/transition season (mid September to mid-November);
- Winter (mid November to mid-March).

May and June are the hottest months of the year with mean daily maximum & minimum temperatures being about 37^0C & 25^0C respectively. Maximum temperatures can rise up to 44^0C Southwest monsoons with high intensity showers commence in late June. The weather at this time is hot and humid. The variation in annual rainfall on year to year basis is appreciable i.e. 700 mm to 1200 mm. The 20 year average rainfall for Chandigarh is 1100.7 mm. January is the coldest month with mean maximum and minimum temperatures being around 23^0C and 3.6^0C respectively. Winds are generally light and blow from northwest to southeast direction with exception of easterly to southeasterly winds that blow on some days during the summer season.

4.2.4 HISTORICAL BACKGROUND

Map 4.3: Partition of Punjab, 1947

- India attained Independence in 1947 & the territory of British India was partitioned to form India and Pakistan. But with it the large Province of Punjab was also divided and Lahore, its capital, fell within the borders of Pakistan leaving East Punjab (India) without a capital.

A) After partition, the population of all the existing towns in East Punjab had more than doubled on account of the migration of displaced persons from Pakistan. There was

further a large influx of migrants from other parts of Pakistan.

- Initially Amritsar was considered as the new capital but was rejected as it was very near to Pakistan border Thus, In March 1948, the Government of Punjab put forward the proposal of the new capital at the foot of the Shivalik Hills, to serve as the capital of East Punjab & also to resettle thousands of refugees who had been uprooted from West Punjab. The area was a flat, gently sloping plain of agricultural land which originally marked the site of about 59 villages dotted with groves of mango trees, with a 1 per cent grade towards southwest & rising Shivalik hills on the northeast. Prime Minister Jawaharlal Nehru laid the foundation stone of Chandigarh on 02 April 1952 at a spot which is now in Sector 9
- Initially American architects Albert Mayer & Matthew Nowicki were inducted for the master plan. Nowicki died in a plane crash & Mayer felt that he could not handle the monumental project alone and withdrew. Le Corbusier, a French architect and urban theorist. & his team finally completed the project. One important feature of the plan was that the city was to be surrounded by a 16 kilometer wide greenbelt that was to ensure that no development could take place in the immediate vicinity of the town

The city was to be developed in three phases

- The first phase of the plan (1950-1965) comprised twenty-nine residential sectors, (sectors 1-12 and 14-30), 3610 ha and accommodating 150,000 persons.
- The second phase (1965-1985) was planned to accommodate 350,000 persons in seventeen sectors, (sectors 31-47), 2425 ha.
- The third phase was for future expansion, namely, to "redensify" the sectors developed in the first two phases, which is now underway

Table 4.2: Phase wise development status, Chandigarh city

Phase	Year	Sectors	Area	Population
Phase I	1950-65	1-30	3610 ha	1.5 lakhs
Phase II	1965-85	31-47	2425 ha	3.5 lakhs
Phase III	1991-	48-56	625 ha	

Source: *statistical Abstrct-2006, UT Chandigarh*

- Subsequently, at the time of reorganization of the state in 1966 (01.11.1966) into Punjab, Haryana and Himachal Pradesh, the city assumed the unique distinction of being the capital city of both, Punjab and Haryana while it itself was declared as a Union Territory and under the direct control of the Central Government.

4.2.5 SATELLITE TOWNS

The Chandigarh Periphery Controlled area was created with the twin objectives of ensuring a planned future expansion of the New Capital City and to prevent mushrooming of unplanned construction around it. The Punjab New Capital (Periphery) Control act, 1952 accordingly aimed at regulating the use of land and preventing unauthorized and unplanned urbanization in a 16 km periphery.

Since then, planned satellite townships of SAS Nagar (Mohali) and Panchkula have come up in the Periphery in addition to a large cantonment. Further in 1990, the State Government declared an area of 10,000 Acres near Dera Bassi, falling within 23 villages of Patiala district, to be a Free Enterprise Zone (FEZ), where the setting up of industries was to be permitted.

Notwithstanding the regulatory framework, enforcement has been patchy. Appreciating the emerging ground realities, the Punjab Government had in 1998 decided to permit an across-the-board regularization of all unauthorized constructions, which had already come up

within the Periphery up to and including 7.12.1998. Simultaneously, it was also decided to evolve a policy framework which would permit the setting up of institutions related to education, health etc., with low density of built-up area, within the Periphery, apart from permitting activities related to leisure and tourism.

4.2.6 DEMOGRAPHY

Chandigarh was planned for a finite population of half-a-million. In Phase I, 36 sq km of land was acquired by the city administration for construction of 30 sectors. Land for seventeen additional sectors (Sector 31 to 47) was acquired and developed during the second phase to cater for a population of 350,000. The predominance of 3/4 storey apartments in the second phase provide for higher population dimension. At later stage development in the third phase has started in sectors 48 and beyond.

Table 4.3: Decadal Population Growth, UT Chandigarh

	1961	1971	1981	1991	2001
Total	119881	257251	451610	642015	900635

Source: *statistical Abstrct-2006, UT Chandigarh*

Fig 4.1: Decadal Population Growth, UT Chandigarh

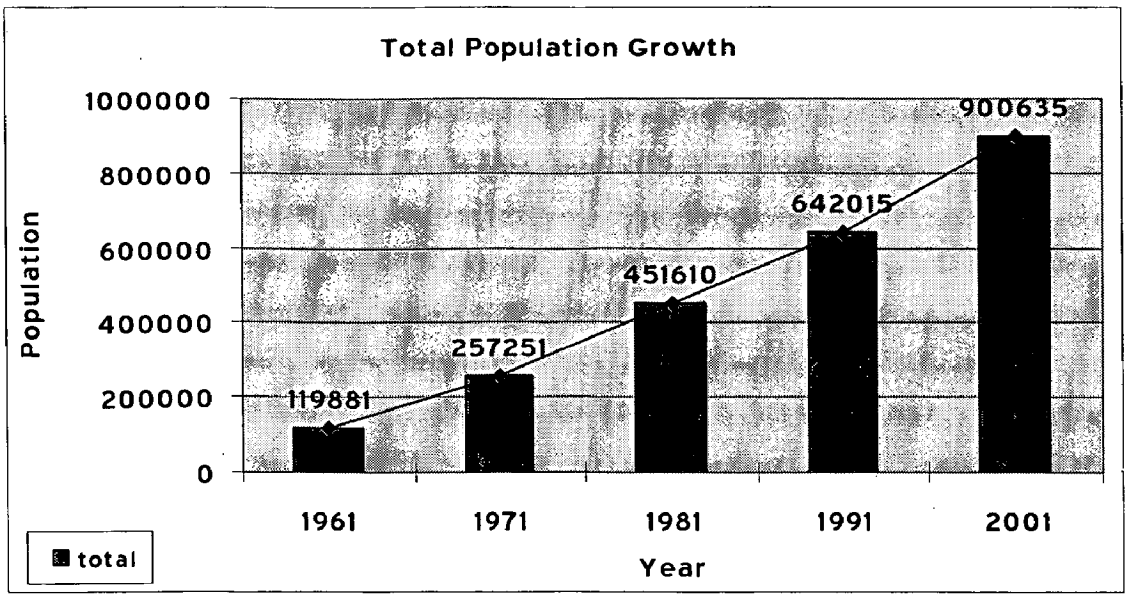


Table 4.4: Decadal Population Growth Rate, UT Chandigarh

	1951-1961	1961-1971	1971-1981	1981-1991	1991-2001
Total	+394.13	+114.59	+75.55	+42.16	+40.33

***Source**: statistical Abstrct-2006, UT Chandigarh*

Demographic data indicate that between 1961 and 1971, the population increased by 144.59 percent, one of the highest for urban areas in India. The growth rate in the subsequent decades has also been very high and a large share of growth is due to migration from the region. According to 1981 census, it grew by another 75.55 percent, followed by 42.16 percent in 1991 and by 40.33 per cent in 2001 (with a total population of 9,00,635). By 2021 the total population of Chandigarh is projected to be around 19.5 lakh (at current rate of growth) almost four times for which it was originally built.

4.2.7 PRESENT SCENARIO

- Chandigarh which was initially planned for 5 lakh people has already accommodated more than double that no. in spite of the fact that it has two satellite cities in Panchkula (Haryana) and SAS Nagar or Mohali (Punjab), built on the lines and design of Chandigarh, which house a major population operating in Chandigarh.
- On account of increasing pressure to provide for even larger numbers, Phase 3 is being developed and comprising Sectors 48 and beyond. At present the population of Chandigarh has already grown to 9.5 Lakh.
- Chandigarh's infrastructure, proximity to Delhi and Punjab, and the IT talent pool attracts IT businesses looking for office space in the area. Chandigarh IT Park (also called Kishangarh IT Park) has come up. Major Indian firms and multinational corporations including Dell, Infosys, Quark, Ranbaxy, Reliance and Satyam have offices in the park.
- It is a also a major study hub for students all over Punjab, Haryana and Himachal

Pradesh, and students from South-East Asia

- A three-day convention held during the golden jubilee celebrations (2003-04) was attended by 800 delegates from around the world. The meetings shed new light on the potential of the city to cope with her condition. Many innovative ideas emerged:
  - The opening up to one another of the sectors,
  - The creation of mixed uses for the streets;
  - The repopulating of the now isolated Capitol Complex area by - creating institutions to attract the public; and
  - **Infrastructure development in neighboring villages to improve quality of life & stem the unmanageable flow of migrants into the city.**

4.3 STUDY AREA

4.3.1 BACKGROUND

The rural area of Chandigarh comprises of 16 villages spread over an area of about 35 sq. km. out of the total 114 sq. km. area of Union Territory. As per census 2001, the population of these villages is 92,120.

- From the very inception of the Chandigarh there were 59 villages coming under the master plan which was to be carried out in three different phases. In the year 1968, rehabilitation for rural settlements falling under Phase-I & northern Phase -II was done but some settlements were allowed to remain in the southern area of the city. As later Phase -II & phase -III development of the sectors has progressed, these villages have been engulfed by the city.
- These villages are exempted from architectural and sanitation controls. Population density in these villages is now extremely high, while water, electricity, sanitation and other services for this population remain grossly inadequate. These are ready market for

milk with the result that the cattle population of these villages has grown although the villages have no grazing land left

- In September 1966 Along with trifurcated of Punjab, the City of Chandigarh (Area under phase-I, II & III) and additional 18 adjoining villages were made into a union territory & capital of both Punjab & Haryana. Thus in the final scheme these 18 rural settlements have to retain their original character.

4.3.2 LOCATION

In the jurisdiction of Chandigarh, there are 16 rural villages & 6 urban villages

Table 4.5: Rural villages in Chandigarh

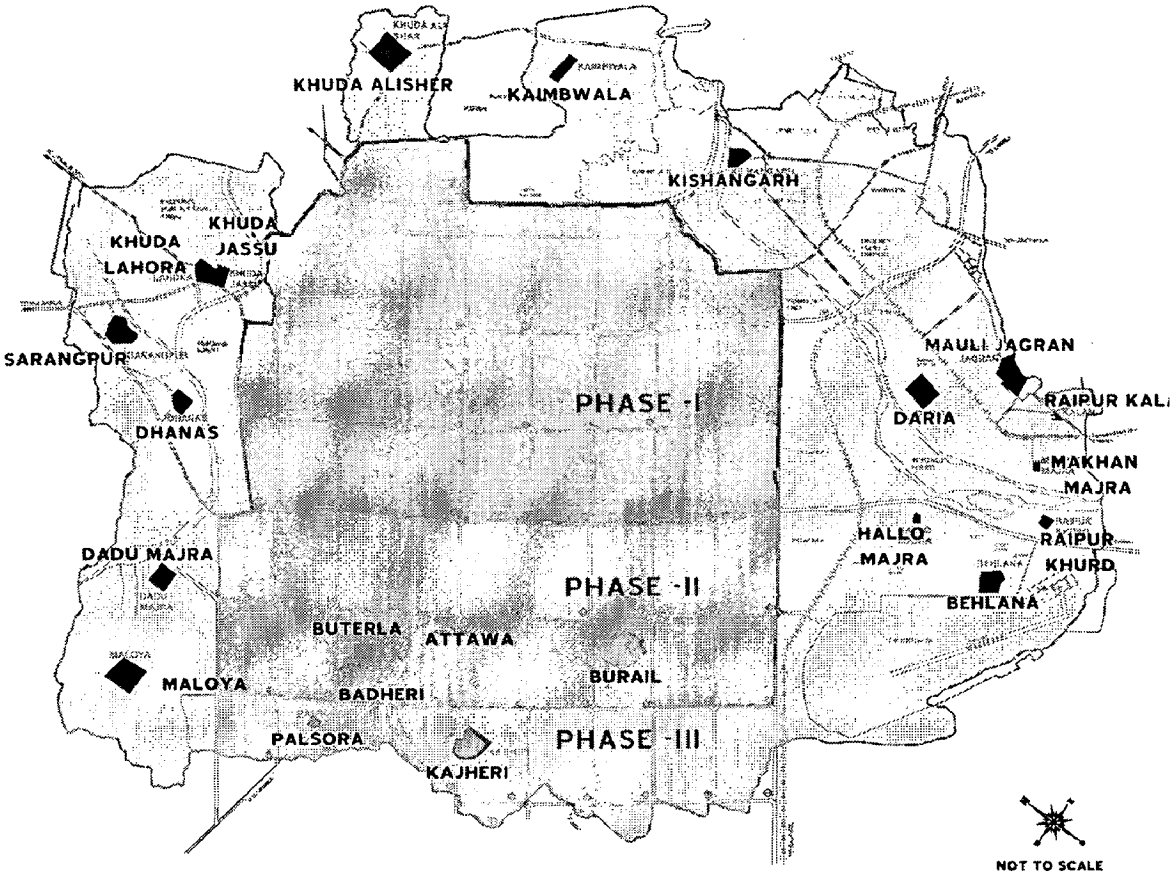
Behlana	Khuda Ali Sher	Mauli Jagran
Dadu Majra	Khuda Jassu	Raipur Kalan
Daria	Khuda Lahora	Raipur Khurd
Dhanas	Kishangarh	Sarangpur
Hallomajra	Makhan Majra	
Kaimbwala	Maloya	

***Source**: statistical Abstrct-2006, UT Chandigarh*

Attawa, Badheri, Burail, Buterla, Kajheri & Palsora are the urban villages

The following map shows the villages engulfed in phase wise developed urban area i.e. urban villages & the rural settlements in UT chandigarh

Map 4.4: villages in UT Chandigarh



Source: *updation of Town planning dept. UT Chandigarh*

The economic activities and the employment opportunities have increased many fold in the Chandigarh region due to which most of the work force from the other states migrate to the region for seeking employment. These low income people have no means to live in the urban area as there is no sufficient affordable accommodation available in the urban area. Hence, in search of affordable accommodation, these migratory forces mostly move & reside in the settlements within the vicinity of Chandigarh.

4.3.3 DEMOGRAPHY

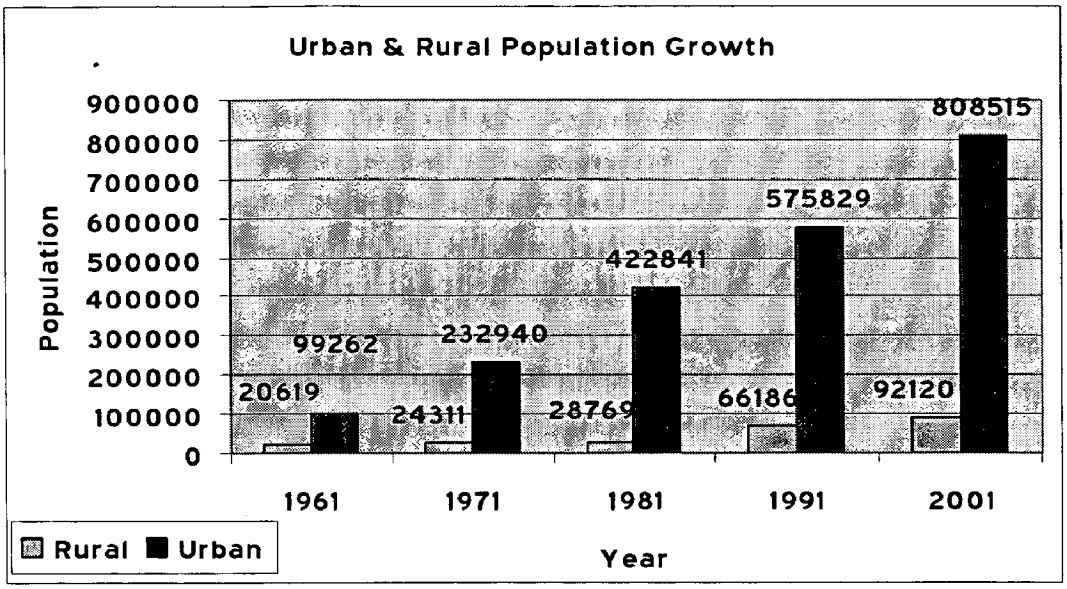
Table 4.6: Rural & urban population growth, UT Chandigarh

	1961	1971	1981	1991	2001
Total	119881	257251	451610	642015	900635

Rural	20619	24311	28769	66186	92120
Urban	99262	232940	422841	575829	808515

***Source**: statistical Abstrct-2006, UT Chandigarh*

Fig 4.2: Rural & urban population growth, UT Chandigarh



In 1961 the rural population of Chandigarh was approximately 20619 which have increased to 1 lakh approx. in 2001.

Table 4.7: Rural & urban population growth rate, UT Chandigarh

	1951-1961	**1961-1971**	**1971-1981**	**1981-1991**	**1991-2001**
Total	+394.13	+114.59	+75.55	+42.16	+40.33
Rural	-15.01	+17.91	+18.34	+130.06	+39.18
Urban	-	+134.67	+81.52	+36.18	+40.46

***Source**: statistical Abstrct-2006, UT Chandigarh*

- In terms of rural population it has registered third highest (39.18) after Daman & Diu & Lakshadweep

Table 4.8: Rural & urban area scenario, UT Chandigarh (in sq.km.)

	1961	1971	1981	1991	2001
Total	114	114	114	114	114
Rural	78	56.40	45.67	36.00	34.66
Urban	36	57.60	68.33	78.00	79.34

***Source**: statistical Abstrct-2006, UT Chandigarh*

- The table shows how the rural area is shrinking with the development of phases II & III of Chandigarh master plan, with rural area shrinking to less than one third of total UT area

Table 4.9: Rural & urban population density, UT Chandigarh (p/sq. km.)

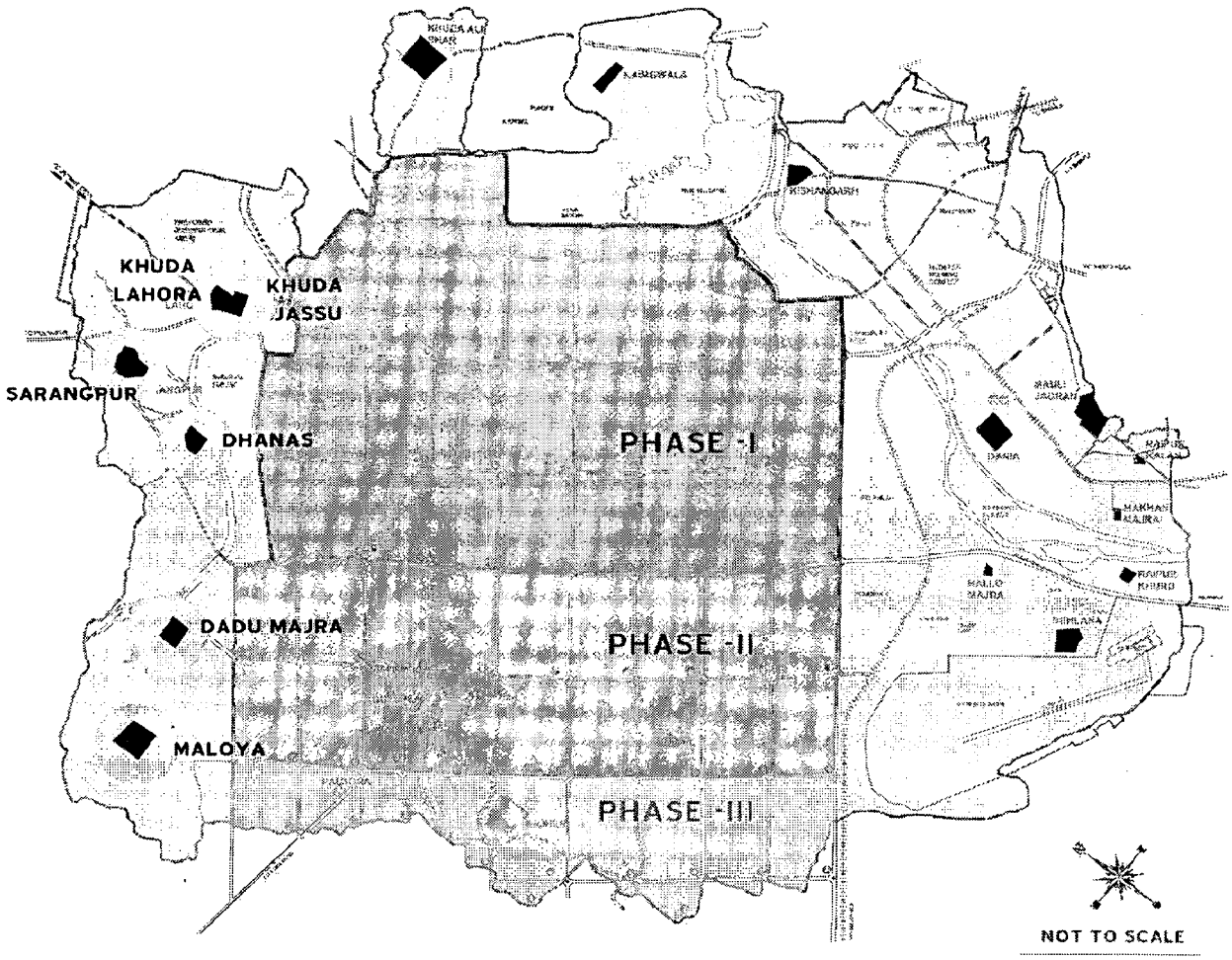
	1961	1971	1981	1991	2001
Total	1051.59	2256.59	3961.49	5631.71	7900.31
Rural	264.35	431.05	629.93	1838.50	2657.82
Urban	2757.28	4044.10	6188.22	7382.42	10190.51

***Source:** statistical Abstrct-2006, UT Chandigarh*

The study area for this research is restricted to six rural settlements namely

- Dadu Majra
- Dhanas
- Khuda Jassu
- Khuda Lahora
- Maloya
- Sarangpur

Map 4.5: Rural settlements under study, UT Chandigarh



Source: *updation of Town planning dept. UT Chandigarh*

5.1.3 PRESENT INFRASTRUCTURE LEVEL

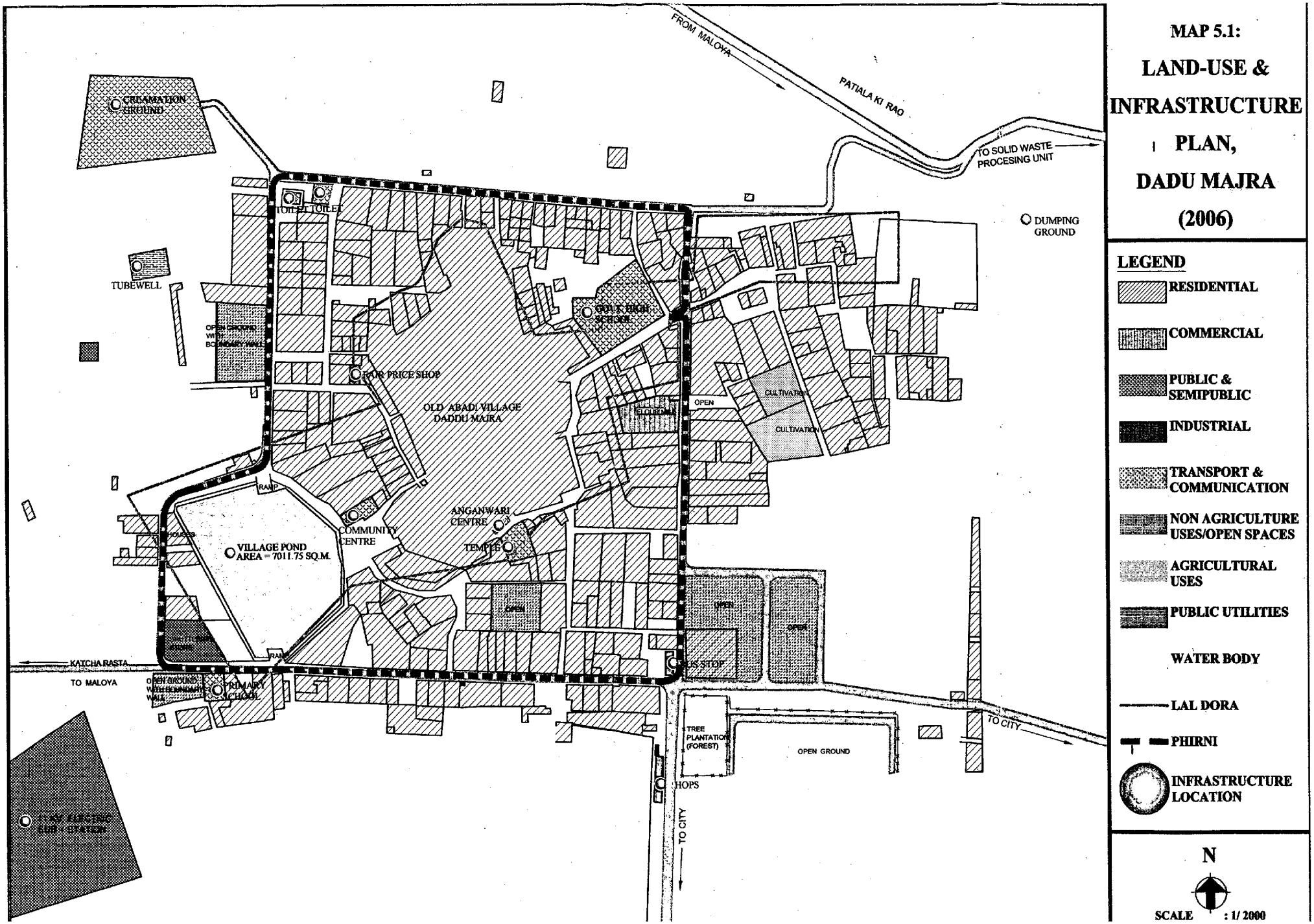
Table 5.2: Infrastructure status, Dadu Majra

GENERAL	
Name Of Rural Settlement	Dadu Majra
Tehsil	Chandigarh
Location	Located at a distance of 7 Km. From Chandigarh Bus stand
Population	3396 (2001 Census)
Total Area	242.81 ha
Panchayat land (land under Lal Dora)	47504.01 sq.m. = 4.75 ha
Major crops	Wheat, Maize, Paddy and fodder crops.
Irrigated area (Up to 25%, 25%-50%, 50%-75%, 75%-100%)	75%-100%
Water body	Pond area = 7011.75 SQ.M.
Use of water body	Washing
INFRASTRUCTURE SERVICES & FACILITIES	
A) PHYSICAL	
Access road (Metalled, Non-Metalled)	Metalled
Streets	60% paved with surface drains
Drinking water	
Tap	Yes
well	Yes
Hand-pumps	Yes
Irrigation	

tube well	Govt. T/well 1 no., private t/well 4.
Electricity	
Street Lighting	Yes
For domestic purpose	Yes
For agriculture purpose	Yes
Gobar Gas plant	No
Solid waste collection & disposal	Dumping ground Solid waste processing unit at 1 km
Sewage disposal	Septic tanks
Flush type toilets	2 blocks with 34 w.c. Provided.
B) SOCIAL	
Education	
Primary school	One govt.
High school	One govt.
Secondary school	No
Integrated School with Hostel Facility	No
Health	
Dispensary	No
Health sub-centre	No
Primary Health Centre	No
Veterinary centre	No
Community facilities	
Community centre/ Panchayat Ghar	One
Anganwari centre	One
Religious sites	

Temple	One
Mosque	No
Gurudwara	No
Church	No
Burial ground	No
:mation ground	One
Cemetery	No
Distributive	
Milk Booth/ Dairy	No
Fair price shop	Yes
LPG godown	No
Others	
Bus station	Yes
Post-office with telephone	No
Police-post	No
Fire station	No
C) COMMERCIAL	
Repair/service shops/daily need shops	7
Credit facility /Banks	
Co-op/agri./SBI & its branches	No

Source: *Field survey & Google earth images & maps from Town planning dept., UT Chandigarh*



MAP 5.1:

LAND-USE & INFRASTRUCTURE PLAN, DADU MAJRA (2006)

LEGEND

- RESIDENTIAL
- COMMERCIAL
- PUBLIC & SEMIPUBLIC
- INDUSTRIAL
- TRANSPORT & COMMUNICATION
- NON AGRICULTURE USES/OPEN SPACES
- AGRICULTURAL USES
- PUBLIC UTILITIES
- WATER BODY
- LAL DORA
- PHIRNI
- INFRASTRUCTURE LOCATION

N

SCALE : 1/ 2000

5.2 DHANAS

5.2.1 PHYSICAL SETTING

The settlement is situated on the western side of UT boundary. Seasonal stream (choe) 'Patiali ki Rao' abuts the east side of the settlement. The settlement has Sarangpur (1.5 km) in the north-west & Dadu Majra (2.75 km) in the south. The settlement of Dhanas comprises of total Lal Dora area of around 13 acres further there is area under habitation outside Lal Dora

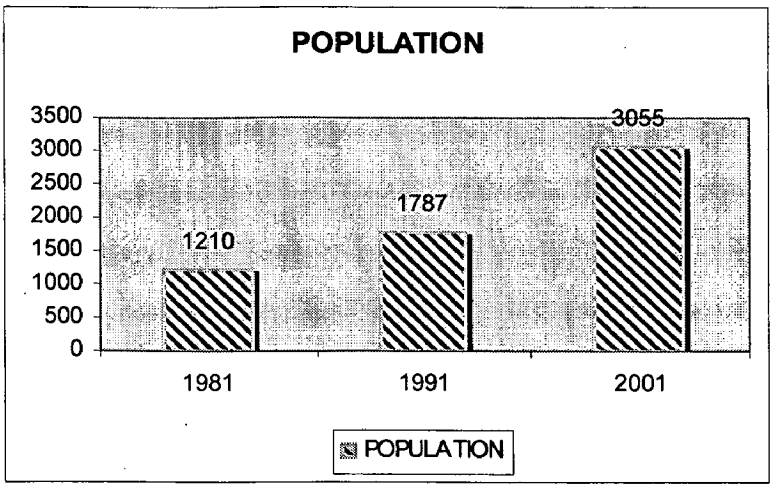
5.2.2 DEMOGRAPHY

Table 5.3: Decade wise population growth, Dhanas

	1981	1991	2001
Population	1210	1787	3055

Source: *statistical Abstrct-2006, UT Chandigarh*

Fig. 5.2: Decade wise population growth, Dhanas



5.2.3 PRESENT INFRASTRUCTURE LEVEL

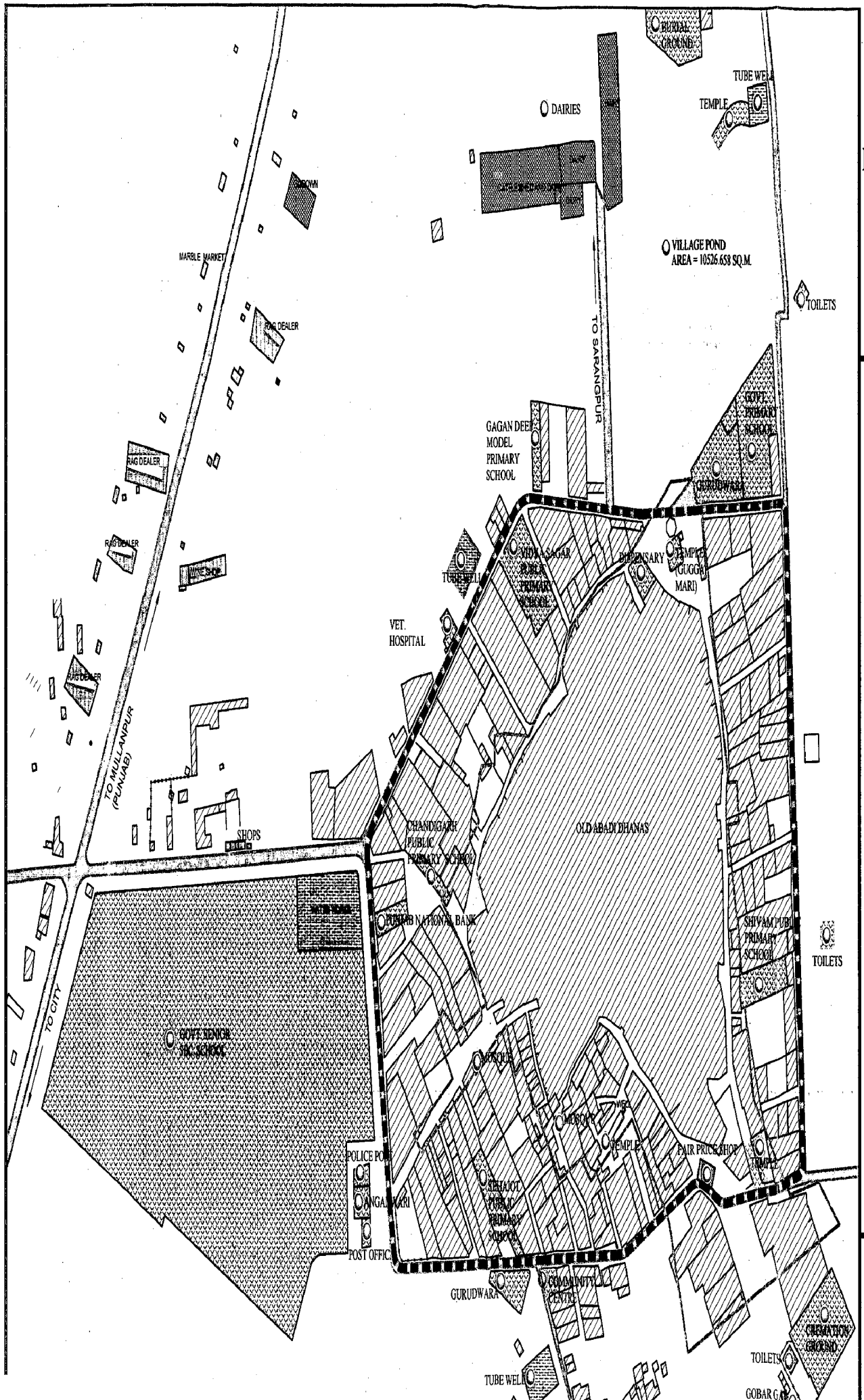
Table 5.4: Infrastructure status, Dhanas

GENERAL	
Name Of Rural Settlement	Dhanas
Tehsil	Chandigarh
Location	Located at a distance of 5 Km. From Chandigarh Bus stand
Population	3055 (2001 Census)
Total Area	292.6 ha
Panchayat land (land under Lal Dora)	52473.65 sq.m. = 5.25 ha
Major crops	Wheat, Maize, Paddy and fodder crops.
Irrigated area (Up to 25%, 25%-50%, 50%-75%, 75%-100%)	75%-100%
Water body	Pond area = 10526.66 SQ.M.
Use of water body	Fishery
INFRASTRUCTURE SERVICES & FACILITIES	
A) PHYSICAL	
Access road (Metalled, Non-Metalled)	Metalled
Streets	80% paved with surface drains
Drinking water	
Tap	Yes
well	Yes
Hand-pump	Yes
Irrigation	
tube well	Govt. T/well 3 no, private t/well 4.

Electricity	
Street Lighting	Yes
For domestic purpose	Yes
For agriculture purpose	Yes
Gobar Gas plant	One
Solid waste collection & disposal	Dumping ground
Sewage disposal	Septic tanks
Flush type toilets	3 blocks with 50 w.c. Provided.
B) SOCIAL	
Education	
Primary school	One govt., five private
High school	No
Secondary school	One govt.
Integrated School with Hostel Facility	No
Health	
Dispensary	One
Health sub-centre	No
Primary Health Centre	No
Veterinary centre	One
Community facilities	
Community centre/ Panchayat Ghar	One
Anganwari centre	One
Religious sites	
Temple	Four
Mosque	Two

Gurudwara	Two
church	No
Burial ground	One
Cremation ground	One
Cemetery	
Distributive	
Milk Booth/Dairy	Yes
Fair price shop	Yes
LPG godown	No
Others	
Bus station	No
Post-office with telephone	Yes
Police-post	One
Fire station	No
C) COMMERCIAL	
Repair/service shops/daily need shops	5
Credit facility /Banks	
Co-op/agri./SBI & its branches	Branch of Punjab national bank

Source: *Field survey & Google earth images & maps from Town planning dept., UT Chandigarh*



MAP 5.2:

LAND-USE & INFRASTRUCTURE PLAN, DHANAS (2006)

LEGEND

- RESIDENTIAL
- COMMERCIAL
- PUBLIC & SEMIPUBLIC
- INDUSTRIAL
- TRANSPORT & COMMUNICATION
- NON AGRICULTURE USES/OPEN SPACES
- AGRICULTURAL USES
- PUBLIC UTILITIES
- WATER BODY
- LAL DORA
- PHIRNI
- INFRASTRUCTURE LOCATION

N

SCALE : 1/ 2000

5.3 KHUDA JASSU

5.3.1 PHYSICAL SETTING

The settlement is situated on the north-western side of UT boundary. Seasonal stream 'Patiali ki Rao' passes from the south-eastern side of the settlement. The settlement has Khuda Lahora abutting on the west & Sarangpur (1.5 km) in the south-west. The settlement of Khuda Jassu comprises of total Lal Dora area of around 3 acres, further there is area under habitation outside Lal Dora

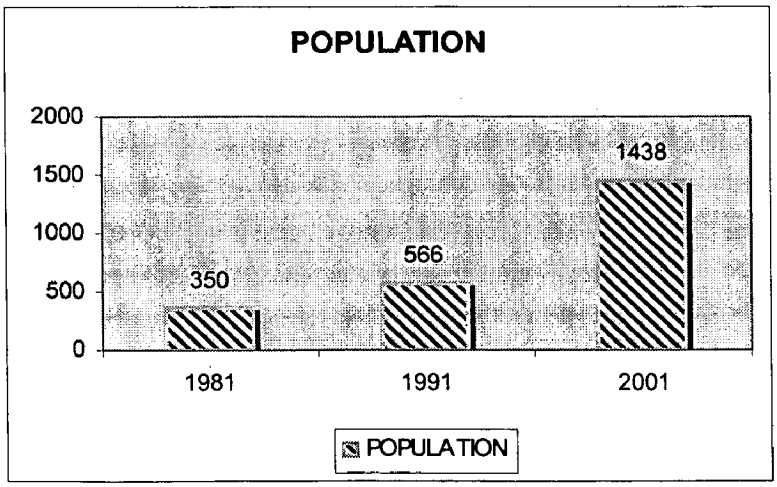
5.3.2 DEMOGRAPHY

Table 5.5: Decade wise population growth, Khuda Jassu

	1981	1991	2001
Population	350	566	1438

Source: *statistical Abstrct-2006, UT Chandigarh*

Fig. 5.2: Decade wise population growth, Khuda Jassu



5.3.3 PRESENT INFRASTRUCTURE LEVEL

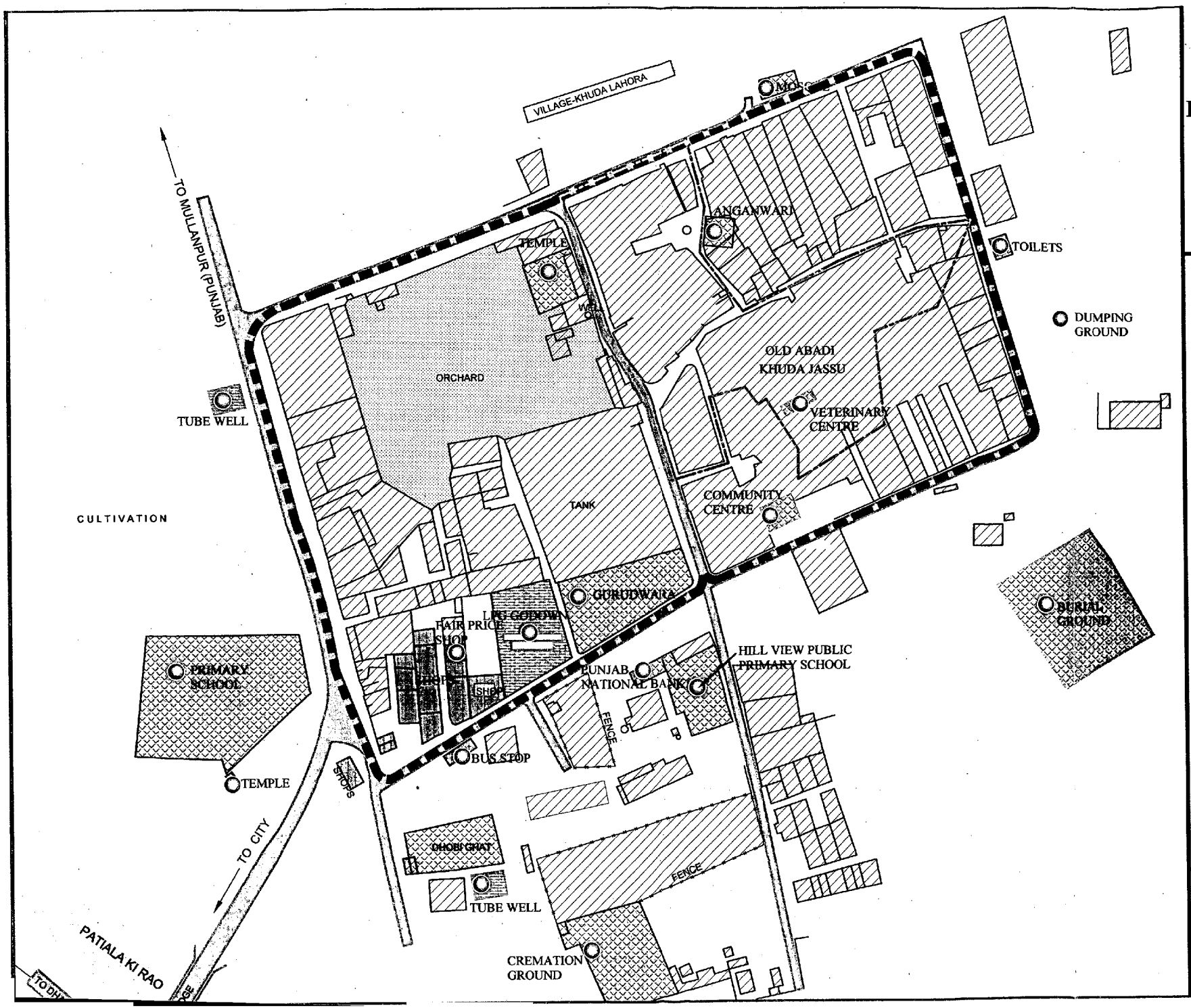
Table 5.6: Infrastructure status, Khuda Jassu

GENERAL	
Name Of Rural Settlement	Khuda Jassu
Tehsil	Chandigarh
Location	Located at Chandigarh-Mullanpur road at a distance of 5.5 Km. From Chandigarh Bus stand
Population	1438 (2001 Census)
Total Area	195.1 ha
Panchayat land (land under Lal Dora)	11869.01 sq.m. = 1.19 ha
Major crops	Wheat, Maize and fodder crops.
Irrigated area (Up to 25%, 25%-50%, 50%-75%, 75%-100%)	75%-100%
Water body	No
Use of water body	-
INFRASTRUCTURE SERVICES & FACILITIES	
A) PHYSICAL	
Access road (Metalled, Non-Metalled)	Metalled
Streets	80% paved with surface drains
Drinking water	
Tap	Yes
well	Yes
Hand-pump	Yes
Irrigation	

tube well	Govt. T/well 2 no.
Electricity	
Street Lighting	Yes
For domestic purpose	Yes
For agriculture purpose	Yes
Gobar Gas plant	No
Solid waste collection & disposal	Dumping ground
Sewage disposal	Septic tanks
Flush type toilets.	1 block provided (14 nos. w.c.)
B) SOCIAL	
Education	
Primary school	One govt., one private
High school	No
Secondary school	No
Integrated School with Hostel Facility	No
Health	
Dispensary	No
Health sub-centre	No
Primary Health Centre	No
Veterinary centre	Yes
	Medical needs of this settlement are catered by the health centre in Khuda Lahora
Community facilities	
Community centre/ Panchayat Ghar	One
Anganwari centre	One

Religious sites	
Temple	Two
Mosque	One
Gurudwara	One
church	No
Burial ground	One
Cremation ground	One
Cemetery	No
Distributive	
Milk Booth	No
Fair price shop	Yes
LPG godown	Yes
Others	
Bus station	Yes
Post-office with telephone	No
Police-post	No
Fire station	No
C) COMMERCIAL	
Repair/service shops/daily need shops	5
Credit facility /Banks	
Co-op/agri./SBI & its branches	Branch of Punjab national bank

Source: *Field survey & Google earth images & maps from Town planning dept., UT Chandigarh*



MAP 5.3:
LAND-USE & INFRASTRUCTURE PLAN, KHUDA JASSU (2006)

LEGEND

- RESIDENTIAL
- COMMERCIAL
- PUBLIC & SEMIPUBLIC
- INDUSTRIAL
- TRANSPORT & COMMUNICATION
- NON AGRICULTURE USES/OPEN SPACES
- AGRICULTURAL USES
- PUBLIC UTILITIES
- WATER BODY
- LAL DORA
- PHIRNI
- INFRASTRUCTURE LOCATION

N

SCALE : 1/ 1500

5.4 KHUDA LAHORA

5.4.1 PHYSICAL SETTING

The settlement is situated on the north-western side of UT boundary. Seasonal stream 'Patiali ki Rao' passes from the south-eastern side of the settlement. The settlement has Khuda Jassu abutting on the east & Sarangpur (1.5 km) in the south-west. Settlement of Khuda Lahora comprises of total Lal Dora area of around 7 acres, further there is area under habitation outside Lal Dora

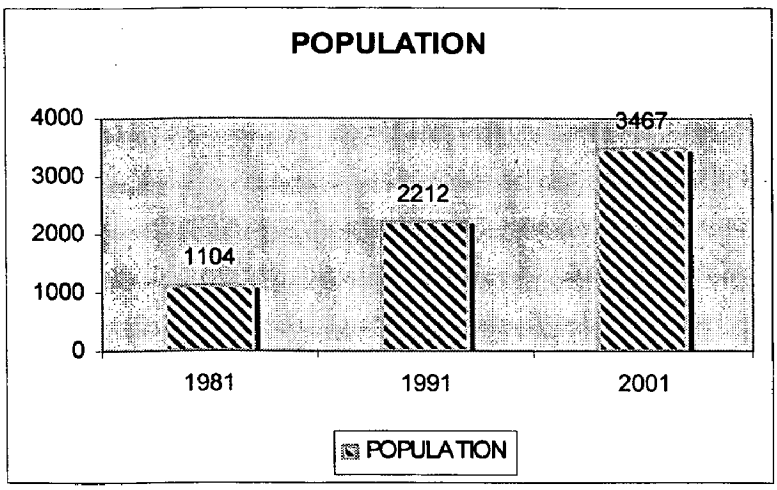
5.4.2 DEMOGRAPHY

Table 5.7: Decade wise population growth, Khuda Lahora

	1981	1991	2001
Population	1104	2212	3467

Source: *statistical Abstrct-2006, UT Chandigarh*

Fig. 5.4: Decade wise population growth, Khuda Lahora



5.4.3 PRESENT INFRASTRUCTURE LEVEL

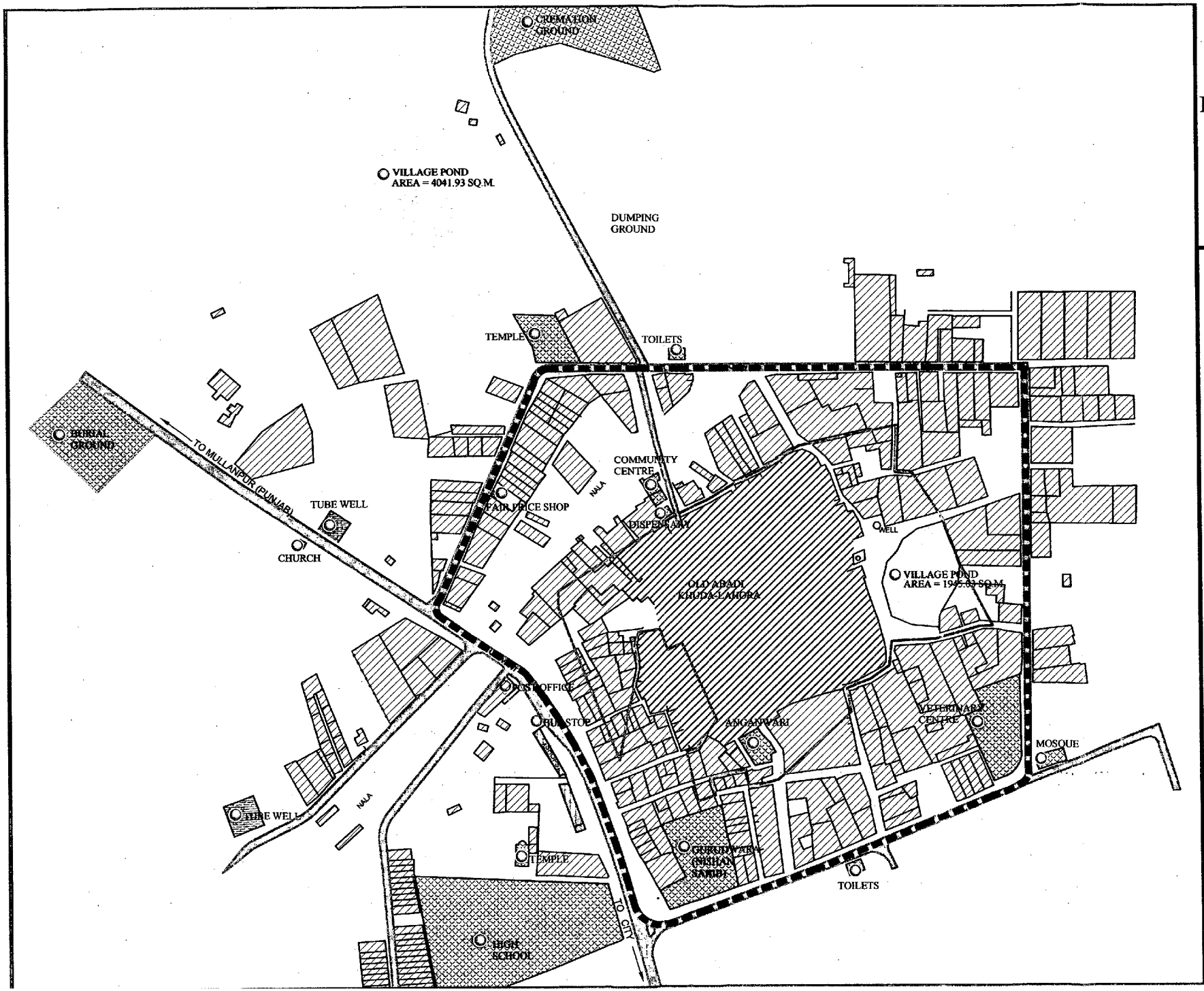
Table 5.8: Infrastructure status, Khuda Lahora

GENERAL	
Name Of Rural Settlement	Khuda Lahora
Tehsil	Chandigarh
Location	Located at at chandiarh_mullanpur road at a distance of 6 km. From chandigarh bus stand
Population	3467 (2001 census)
Total Area	314.04 ha
Panchayat land (land under Lal Dora)	28063.46 sq.m. = 2.81 ha
Major crops	Wheat, maize, paddy and fodder crops.
Irrigated area (Up to 25%, 25%-50%, 50%-75%, 75%-100%)	75%-100%
Water body	2 ponds, area = 1945 sq.m. & 4041.93 sq.m.
Use of water body	Washing
INFRASTRUCTURE SERVICES & FACILITIES	
A) PHYSICAL	
Access road(Metalled, Non-Metalled)	Metalled
Streets	80% paved with surface drains
Drinking water	
Tap	Yes
well	Yes
Hand-pump	Yes
Irrigation	

tube well	Govt. T/well 2 n0.,
Electricity	
Street Lighting	Yes
For domestic purpose	Yes
For agriculture purpose	Yes
Gobar Gas plant	No
Solid waste collection & disposal	Dumping ground
Sewage disposal	Septic tanks
Flush type toilets	2 blocks with 20 w.c. Provided
B) SOCIAL	
Education	
Primary school	No
High school	One
Secondary school	No
Integrated School with Hostel Facility	No
Health	
Dispensary	One
Health sub-centre	No
Primary Health Centre	No
Veterinary centre	One
Community facilities	
Community centre/ Panchayat Ghar	One
Anganwari centre	One
Religious sites	
Temple	Two

Mosque	One
Gurudwara	One
church	One
Burial ground	One
Cremation ground	One
Cemetery	No
Distributive	
Milk Booth	No
Fair price shop	Yes
LPG godown	No
Others	
Bus station	Yes
Post-office with telephone	Yes
Police-post	None
Fire station	No
C) COMMERCIAL	
Repair/service shops/daily need shops	10-12
Credit facility /Banks	
Co-op/agri./SBI & its branches	No

Source: *Field survey & Google earth images & maps from Town planning dept., UT Chandigarh*



MAP 5.4:
LAND-USE & INFRASTRUCTURE PLAN, KHUDA LAHORA (2006)

LEGEND

- RESIDENTIAL
- COMMERCIAL
- PUBLIC & SEMIPUBLIC
- INDUSTRIAL
- TRANSPORT & COMMUNICATION
- NON AGRICULTURE USES/OPEN SPACES
- AGRICULTURAL USES
- PUBLIC UTILITIES
- WATER BODY
- LAL DORA
- PHIRNI
- INFRASTRUCTURE LOCATION

N

SCALE : 1/ 2000

5.5 MALOYA

5.5.1 PHYSICAL SETTING

The settlement is situated on the south-western side of UT boundary. The settlement has Dadu Majra (1.5 km) in the north. The settlement of Maloya comprises of total Lal Dora area of around 27 acres, which is largest within the study area, further there is area under habitation outside Lal Dora

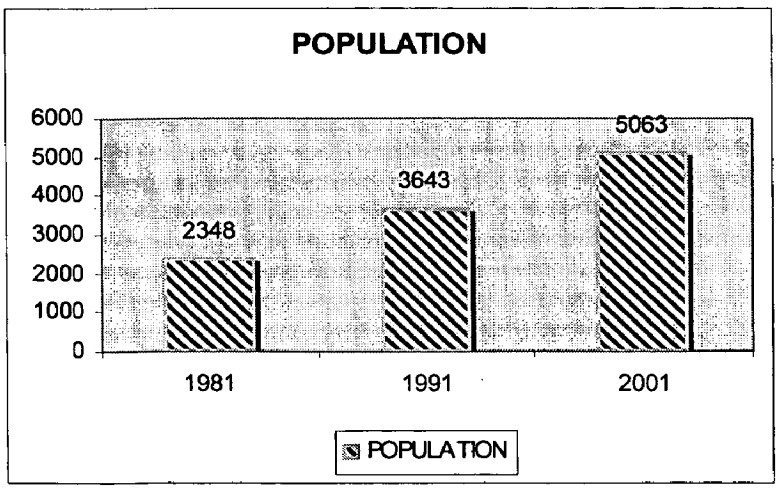
5.5.2 DEMOGRAPHY

Table 5.9: Decade wise population growth, Maloya

	1981	1991	2001
Population	2348	3643	5063

Source: *statistical Abstrct-2006, UT Chandigarh*

Fig. 5.5: Decade wise population growth, Maloya



5.5.3 PRESENT INFRASTRUCTURE LEVEL

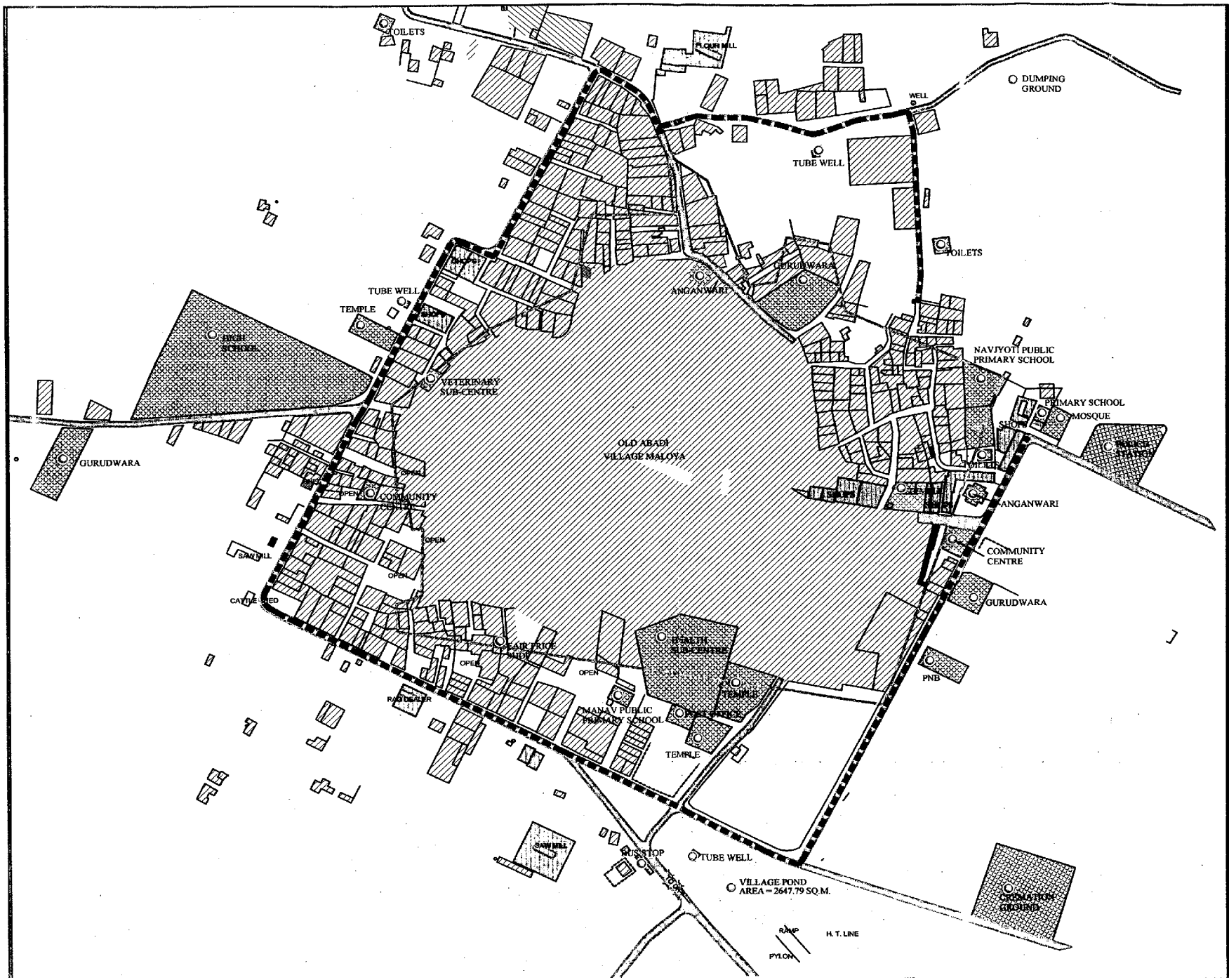
Table 5.10: Infrastructure status, Maloya

GENERAL	
Name Of Rural Settlement	Maloya
Tehsil	Chandigarh
Location	Located at a distance of 8 km. From Chandigarh bus stand
Population	5063 (2001 census)
Total Area	292.6 acre
Panchayat land (land under Lal Dora)	108784.78 sq.m. = 10.88 ha
Major crops	Wheat, maize, paddy and fodder crops.
Irrigated area (Up to 25%, 25%-50%, 50%-75%, 75%-100%)	75%-100%
Water body	Ponds, area = 2647.79 sq.m.
Use of water body	Washing
INFRASTRUCTURE SERVICES & FACILITIES	
A) PHYSICAL	
Access road (Metalled, Non-Metalled)	Metalled
Streets	70% paved with surface drains
Drinking water	
Tap	Yes
well	Yes
Hand-pump	Yes
Irrigation	

tube well	Govt. T/well 3 no., private t/well 4.
Electricity	
Street Lighting	Yes
For domestic purpose	Yes
For agriculture purpose	Yes
Gobar Gas plant	No
Solid waste collection & disposal	Dumping ground
Sewage disposal	Septic tanks
Flush type toilets	3 blocks with 50 w.c. Provided.
B) SOCIAL	
Education	
Primary school	One govt., two private
High school	One govt.
Secondary school	No
Integrated School with Hostel Facility	No
Health	
Dispensary	No
Health sub-centre	One
Primary Health Centre	No
Veterinary centre	One
Community facilities	
Community centre/ Panchayat Ghar	Two
Anganwari centre	Two
Religious sites	
Temple	Four

Mosque	One
Gurudwara	Three
church	No
Burial ground	No
Cremation ground	One
Cemetery	No
Distributive	
Milk Booth	No
Fair price shop	Yes
LPG godown	No
Others	
Bus station	Yes
Post-office with telephone	Yes
Police-post	One police station
Fire station	No
C) COMMERCIAL	
Repair/service shops/daily need shops	15-18
Credit facility /Banks	
Co-op/agri./SBI & its branches	Branch of Punjab national bank

Source: *Field survey & Google earth images & maps from Town planning dept., UT Chandigarh*



MAP 5.5:

LAND-USE & INFRASTRUCTURE PLAN, MALOYA (2006)

LEGEND

- RESIDENTIAL
- COMMERCIAL
- PUBLIC & SEMIPUBLIC
- INDUSTRIAL
- TRANSPORT & COMMUNICATION
- NON AGRICULTURE USES/OPEN SPACES
- AGRICULTURAL USES
- PUBLIC UTILITIES
- WATER BODY
- LAL DORA
- PHIRNI
- INFRASTRUCTURE LOCATION

N

SCALE : 1/ 2500

5.6 SARANGPUR

5.6.1 PHYSICAL SETTING

The settlement is situated on the north-west end of UT boundary. Seasonal stream 'Patiali ki Rao' abuts the north-east side of the settlement. The settlement has settlements Khuda Jassu & Khuda Lahora (1.5 km) on the north-east side & settlement Dhanas (1.5 km) on the south-east. The settlement Sarangpur comprises of total Lal Dora area of around 17 acres, further there is area under habitation outside Lal Dora

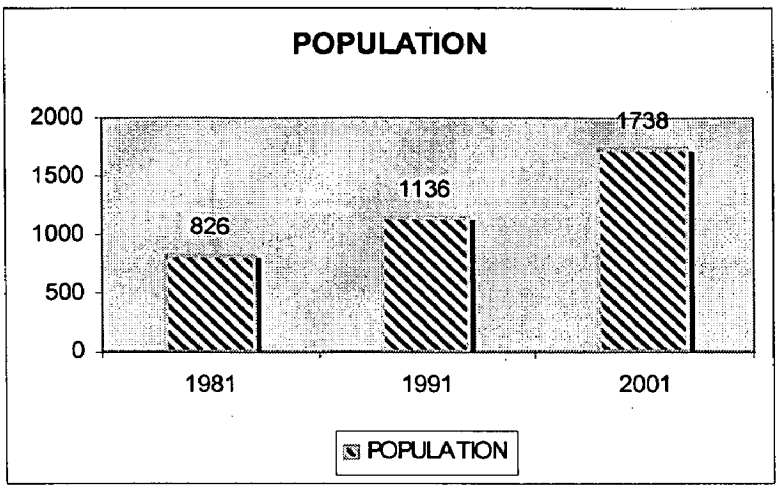
5.6.2 DEMOGRAPHY

Table 5.11: Decade wise population growth, Sarangpur

	1981	1991	2001
Population	826	1136	1738

Source: *statistical Abstrct-2006, UT Chandigarh*

Fig. 5.6: Decade wise population growth, Sarangpur



5.6.3 PRESENT INFRASTRUCTURE LEVEL

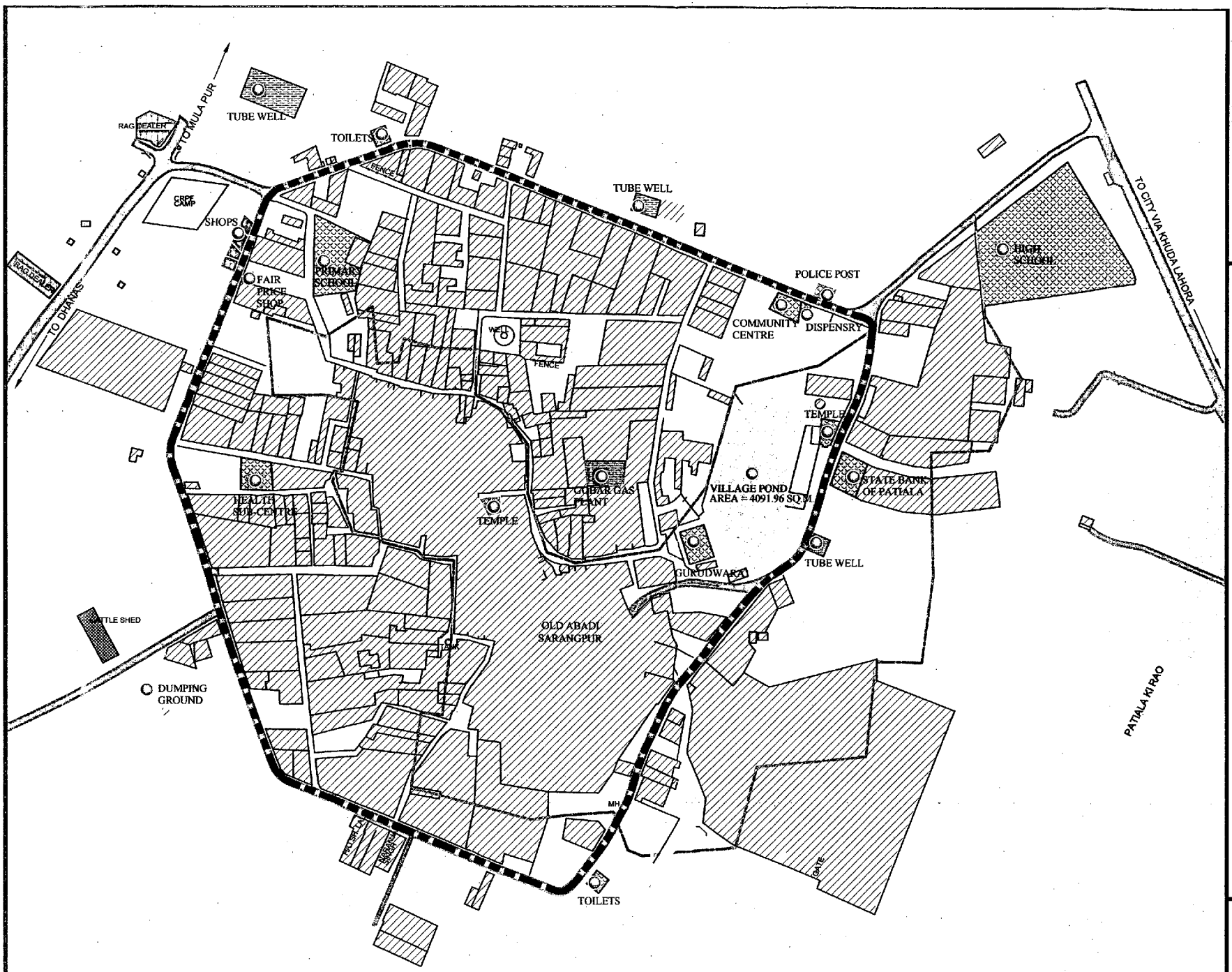
Table 5.12: Infrastructure status, Sarangpur

GENERAL	
Name Of Rural Settlement	Sarangpur
Tehsil	Chandigarh
Location	Located at a distance of 7.5 km. From Chandigarh bus stand
Population	1738 (2001 census)
Total Area	673 acre
Panchayat land (land under Lal Dora)	68037.99 sq.m. = 6.80 ha
Major crops	Wheat, maize and fodder crops.
Irrigated area (Up to 25%, 25%-50%, 50%-75%, 75%-100%)	75%-100%
Water body	Pond, area = 4091.96 sq.m.
Use of water body	Fishery
INFRASTRUCTURE SERVICES & FACILITIES	
A) PHYSICAL	
Access road (Metalled, Non-Metalled)	Metalled
Streets	70% paved with surface drains
Drinking water	
Tap	Yes
well	Yes
Hand-pump	Yes
Irrigation	
tube well	Govt. T/well 3 no., private t/well 4.

Electricity	
Street Lighting	Yes
For domestic purpose	Yes
For agriculture purpose	Yes
Gobar Gas plant	one
Solid waste collection & disposal	Dumping ground
Sewage disposal	Septic tanks
Flush type toilets	2 blocks with 30 w.c. Provided.
B) SOCIAL	
Education	
Primary school	One govt.
High school	One govt.
Secondary school	No
Integrated School with Hostel Facility	No
Health	
Dispensary	One
Health sub-centre	One
Primary Health Centre	No
Veterinary centre	No
Community facilities	
Community centre/ Panchayat Ghar	One
Anganwari centre	No
Religious structure	
Temple	Two
Mosque	No

Gurudwara	One
church	No
Burial ground	No
Cremation ground	No
Cemetery	No
Distributive	
Milk Booth	No
Fair price shop	Yes
LPG godown	No
Others	
Bus station	No
Post-office with telephone	No
Police-post	One
Fire station	No
C) COMMERCIAL	
Repair/service shops/daily need shops	3-4
Credit facility /Banks	
Co-op/agri./SBI & its branches	A branch of state bank of Patiala

Source: *Field survey & Google earth images & maps from Town planning dept., UT Chandigarh*



MAP 5.6:

LAND-USE & INFRASTRUCTURE PLAN, SARANGPUR (2006)

LEGEND

- RESIDENTIAL
- COMMERCIAL
- PUBLIC & SEMIPUBLIC
- INDUSTRIAL
- TRANSPORT & COMMUNICATION
- NON AGRICULTURE USES/OPEN SPACES
- AGRICULTURAL USES
- PUBLIC UTILITIES
- WATER BODY
- LAL DORA
- PHIRNI
- INFRASTRUCTURE LOCATION

N

SCALE : 1/ 2000

6. INFRASTRUCTURE FORECASTING

6.1 INTRODUCTION

It deals with forecasting the infrastructure facilities required, for the year 2031 A.D. The population is projected for the year 2031 by using suitable statistical methods. Depending on increase in population, extra facilities, & requirements are calculated by using suitable planning standards.

6.2 FORECASTING FOR THE YEAR 2031

There are few methods available for population projections such as, geometric increment method, regression method, arithmetic increment method, incremental increase method, logistic curve method, etc. in this investigation population is considered as the focal point. Considering the population, other requirements are calculated by employing relevant standards, which have been set for different variables by different concerned organizations. To have plausible projections, the planning standards which are given in the UDPFI (Urban Development Plan Formulation & Implementation) guidelines have also been referred.

To project the population availability for the year 2031, geometric increment method is employed by considering the population increment from 1981 to 1991 and 1991 to 2001 census and then taking average decadal growth rate. The method, which is followed, for population's calculation for the study is as follows:

6.3 POPULATION PROJECTIONS

Table 6.1: Decade Wise Population Growth In study area Settlements

S. No.	Name of settlement	Population 1981	Population 1991	Population 2001
1	Dadu Majra	1217	2163	3396
2	Dhanas	1210	1787	3055
3	Khuda Jassu	350	566	1438
4	Khuda Lahora	1104	2212	3467
5	Maloya	2348	3643	5063
6	Sarangpur	826	1136	1738

Source: *statistical Abstrct-2006, UT Chandigarh*

6.3.1 DADU MAJRA

Total population in the year 1981 = 1217

Total population in the year 1991 = 2163

Total population in the year 2001 = 3396

Using geometric increment method

$P_n = P_o (1+r)^n$

Where

P_o = population at base year

P_n = forecasted population n years hence from base year

n = number of years

r = population growth rate

Population Growth rate (1981-1991)

$R1 = (p_n/p_0)^{1/n} - 1$

$= (2163/1217)^{0.1} - 1$

$= 0.0592 =$ **5.92 %**

Population Growth rate (1991-2001)

$R2 = (p_n/p_0)^{1/n} - 1$

$= (3396/2163)^{0.1} - 1$

$= 0.0461 =$ **4.61 %**

Average growth rate (1981-2001)

$R = (5.92+4.61)/2$

=5.27%

Therefore,

Projected population for 2031

$P_{2031} = P_o (1+R)^n$

$= 3396 (1+ .053)^{30}$

$=$ **15830**

Similarly,

Projected population for 2006, P_{2006} **= 4389**

6.3.2 DHANAS

Total population in the year 1981 = 1210

Total population in the year 1991 = 1787

Total population in the year 2001 = 3055

Population Growth rate (1981-1991)

$R1 = (p_n/p_0)^{1/n} - 1$

$= (1787/1210)^{0.1} - 1$

$= 0.0398 =$ **3.98%**

Population Growth rate (1991-2001)

$R2 = (p_n/p_0)^{1/n} - 1$

$= (3055/1787)^{0.1} - 1$

$= 0.0551 =$ **5.51 %**

Average growth rate (1981-2001)

$R = (3.98+5.51)/2$

=4.75%

Therefore,

Projected population for 2031

$P_{2031} = P_o (1+R)^n$

$= 3055 (1+ .047)^{30}$

= 12275

Similarly

Projected population for 2006, P_{2006} **= 3852**

6.3.3 KHUDA JASSU

Total population in the year 1981 = 350

Total population in the year 1991 = 566

Total population in the year 2001 = 1438

Population Growth rate (1981-1991)

$R1 = (p_n/p_0)^{1/n} - 1$

$= (566/350)^{0.1} - 1$

$= 0.0492 =$ **4.92 %**

Population Growth rate (1991-2001)

$R2 = (p_n/p_0)^{1/n} - 1$

$= (1438/566)^{0.1} - 1$

$= 0.0977 =$ **9.77 %**

Average growth rate (1981-2001)

$R = (4.92+9.77)/2$

$=$ **7.35%**

Therefore,

Projected population for 2031

$P_{2031} = P_o (1+R)^n$

$= 1438 (1+ .074)^{30}$

$=$ **12056**

Similarly,

Projected population for 2006, P_{2006} **= 2050**

6.3.4 KHUDA LAHORA

Total population in the year 1981 = 1104

Total population in the year 1991 = 2212

Total population in the year 2001 = 3467

Population Growth rate (1981-1991)

$R1 = (p_n/p_0)^{1/n} - 1$

$= (2212/1104)^{0.1} - 1$

$= 0.0612 =$ **6.12%**

Population Growth rate (1991-2001)

$R2 = (p_n/p_0)^{1/n} - 1$

$= (3467/2212)^{0.1} - 1$

$= 0.0566 =$ **5.66%**

Average growth rate (1981-2001)

$R = (6.12+5.66)/2$

$=$ **5.89%**

Therefore,

Projected population for 2031

$P_{2031} = P_o (1+R)^n$

$= 3467 (1+ .059)^{30}$

$=$ **19302**

Similarly,

Projected population for 2006, P_{2006} = 4616

6.3.5 MALOYA

Total population in the year 1981 = 2348

Total population in the year 1991 = 3643

Total population in the year 2001 = 5063

Population Growth rate (1981-1991)

$R1 = (p_n/p_0)^{1/n} - 1$

$= (3643/2348)^{0.1} - 1$

$= 0.0449 =$ **4.49 %**

Population Growth rate (1991-2001)

$R2 = (p_n/p_0)^{1/n} - 1$

$= (5063/3643)^{0.1} - 1$

$= 0.035 =$ **3.35 %**

Average growth rate (1981-2001)

$R = (4.49+3.35)/2$

$=$ **3.92%**

Therefore,

Projected population for 2031

$P_{2031} = P_o (1+R)^n$

$= 5063 (1+ .039)^{30}$

$=$ **16047**

Similarly,

Projected population for 2006, P_{2006} = 6136

6.3.6 SARANGPUR

Total population in the year 1981 = 826

Total population in the year 1991 = 1136

Total population in the year 2001 = 1738

Population Growth rate (1981-1991)

$R1 = (p_n/p_0)^{1/n} - 1$

$= (1136/826)^{0.1} - 1$

$= .0324 =$ **3.24 %**

Population Growth rate (1991-2001)

$R2 = (p_n/p_0)^{1/n} - 1$

$= (1738/1136)^{0.1} - 1$

$= 0.0434 =$ **4.34 %**

Average growth rate (1981-2001)

$R = (3.24+4.34)/2$

=3.79%

Therefore,

Projected population for 2031

$P_{2031} = P_o (1+R)^n$

$= 1738 (1+ .038)^{30}$

= 5305

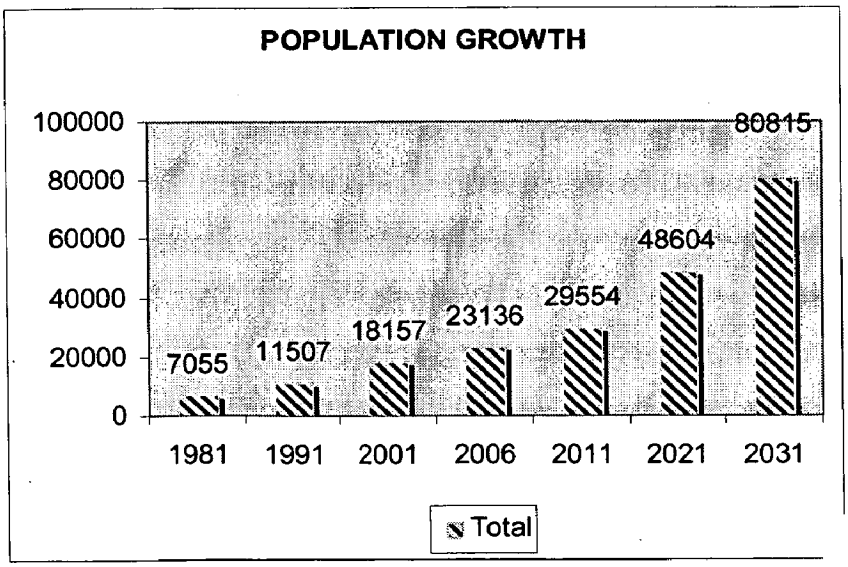
Similarly,

Projected population for 2006, P_{2006} **= 2093**

Table 6.2: Decadal Population Growth & Projections in study area Settlements

Name of settlement	1981	1991	2001	2011	2021	2031
Dadu Majra	1217	2163	3396	5673	9476	15830
Dhanas	1210	1787	3055	4857	7721	12275
Khuda Jassu	350	566	1438	2921	5935	12056
Khuda Lahora	1104	2212	3467	6145	10891	19302
Maloya	2348	3643	5063	7437	10924	16047
Sarangpur	826	1136	1738	2521	3657	5305
Total	**7055**	**11507**	**18157**	**29554**	**48604**	**80815**

Fig 6.1: Decadal Population Growth & Projections in study area Settlements



6.4 INFRASTRUCTURE FORECAST

The important amenities needed for proper functioning of a rural settlement, considered for projections in this present research are:

6.4.1 PHYSICAL INFRASTRUCTURE

Table 6.3: Physical infrastructure norms & projection for the year 2031

Amenities/ Facilities	Norms/ Standards	Total Requirement (2031)	Unit
Water supply domestic	40 lpcd	3,232,600	LPD
	1 source per 50-300	323	NO.
Electricity	one sub-station (11 kv) per 15000	5	NO.
Solid waste	.25 kg per person per day	20,204	KGPD
Sewage	80% of water supply	2,586,080	LPD
	1 toilet for 4-5 families	3,233	NO.

6.4.2 SOCIAL INFRASTRUCTURE

Table 6.4: Education infrastructure norms & projection for the year 2031

Amenities/ Facilities	Norms/ Standards	Total Requirement (2031)	Unit
Primary school	1 per 2500	32	NO.
High school	1 per 5000	16	NO.
Senior secondary school	1 per 7500	11	NO.
Integrated school with hostel facility	1 per 90000-100000	1	NO.

Table 6.5: Health infrastructure norms & projection for the year 2031

Amenities/ Facilities	Norms/ Standards	Total Requirement (2031)	Unit
Health sub-centre	1 per 5000	16	NO.
Dispensary	1 per 15000	5	NO.
Primary health centre	1 per 30000	3	NO.
Veterinary centre	1 per 30000	3	NO.

Table 6.6: Community Facilities norms & projection for the year 2031

Amenities/ Facilities	Norms/ Standards	Total Requirement (2031)	Unit
Community centre	1 per 5000	16	NO.
Anganwari centre	1 per 1000	81	NO.
Religious sites	each religion as per settlement	24	NO.
Cremation/ burial/ cemetery	each religion as per settlement	18	NO.

Table 6.7: Distributive Facilities norms & projection for the year 2031

Amenities/ Facilities	Norms/ Standards	Total Requirement (2031)	Unit
Milk Booth	1 per 5,000	16	NO.
Fair Price Shop	every settlement	6	NO.
LPG Godown	1 per 40,000-50,000	2	NO.

Table 6.8: Other Social Facilities norms & projection for the year 2031

Amenities/ Facilities	Norms/ Standards	Total Requirement (2031)	Unit
Bus stop	every settlement	6	NO.
Post-office with telephone	every settlement	6	NO.

Police post	1 per 40,000-50,000	2	NO.
Fire station	1 per 200,000	0	NO.

6.4.3 COMMERCIAL INFRASTRUCTURE

Table 6.9: Commercial infrastructure norms & projection for the year 2031

Amenities/ Facilities	Norms/ Standards	Total Requirement (2031)	Unit
Convenient Shops	1 per 200 (population 5000-20000)	404	NO.
Bank	every settlement	6	NO.

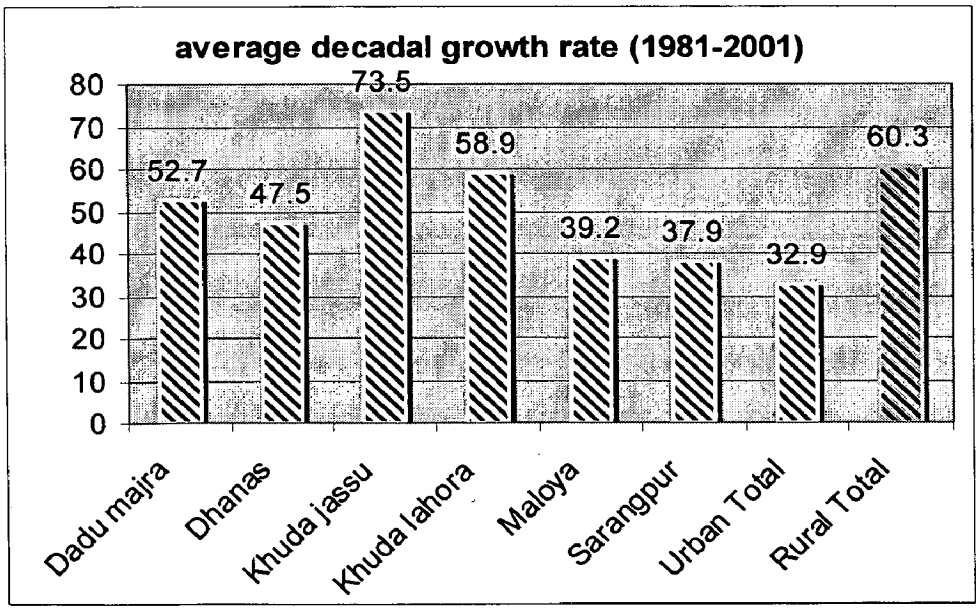
7. ANALYSIS AND FINDINGS

7.1 POPULATION SCENARIO

Table 7.1: Average Decadal Growth Rate for the study area settlements (1981-2001)

Dadu Majra	Dhanas	Khuda Jassu	Khuda Lahora	Maloya	Sarangpur	Urban Total	Rural Total
52.7	47.5	73.5	58.9	39.2	37.9	32.9	60.3

Fig 7.1: Average Decadal Growth Rate for the study area settlements (1981-2001)

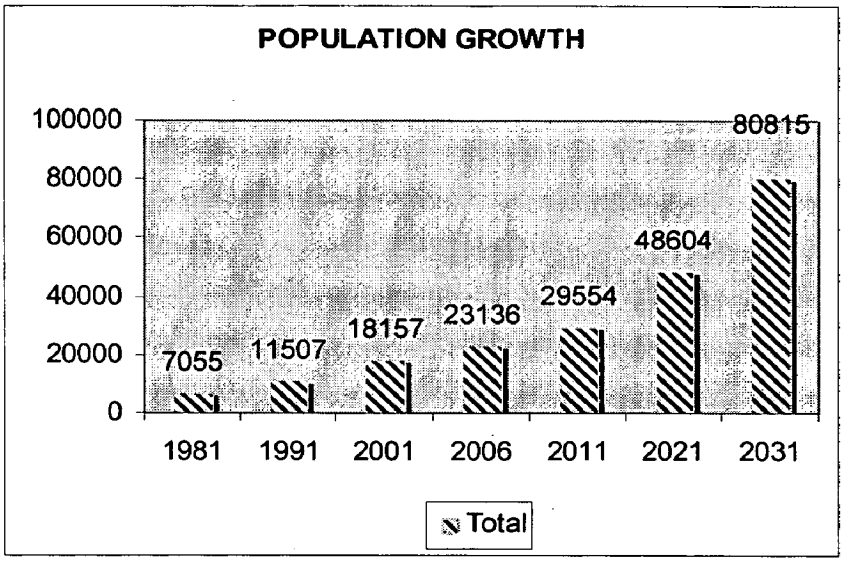


The fig. 7.1 shows all the villages registering higher decadal growth rate than the urban areas which is 33 %. Thus the rural settlements in UT Chandigarh are under tremendous population pressure which is truly a spill over from the city

Table 7.2: Overall Population Projection & Growth of Study Area

	1981	1991	2001	2006	2011	2021	2031
Total	7055	11507	18157	23136	29554	48604	80815

Fig 7.2: Overall Population Projection & Growth of Study Area



The chart shows how the population of the study area is growing & would be four times the current population in 2031

7.2 INFRASTRUCTURE SCENARIO

7.2.1 PHYSICAL INFRASTRUCTURE

A) WATER SUPPLY

Earlier the villages used to depend upon the community wells for the much required water for their domestic needs. Now piped water supply has been provided in all the villages in the form of community taps for domestic use. The hand pumps & wells acts as private

source.

B) SEWERAGE

There is no sewerage system existing in any village. Some of the affluent people have constructed the septic tanks or soak pits in their households

C) DRAINAGE

all the village has brick lined drains lined around both sides of the streets, except some interior 'kutcha' streets where the drains are 'kutcha' and overflowing. The problems of overflowing, clogging and bad odor exist in these parts. The open drains act a very conducive house to the mosquitoes, flies etc., which in turn lead to various diseases like malaria, dengue etc.

D) ELECTRICITY

The villages are electrified with metered connections and the bills are collected on once every two months basis but there are minor cases of pilferage of the electricity, even among those who have legal metered connection.

E) SOLID WASTE DISPOSAL

All the villages have some open ground which has been earmarked for dumping field for waste. There is a Solid waste processing unit at 1 km from village Dadu Majra where the the villages is processed & converted to manure.

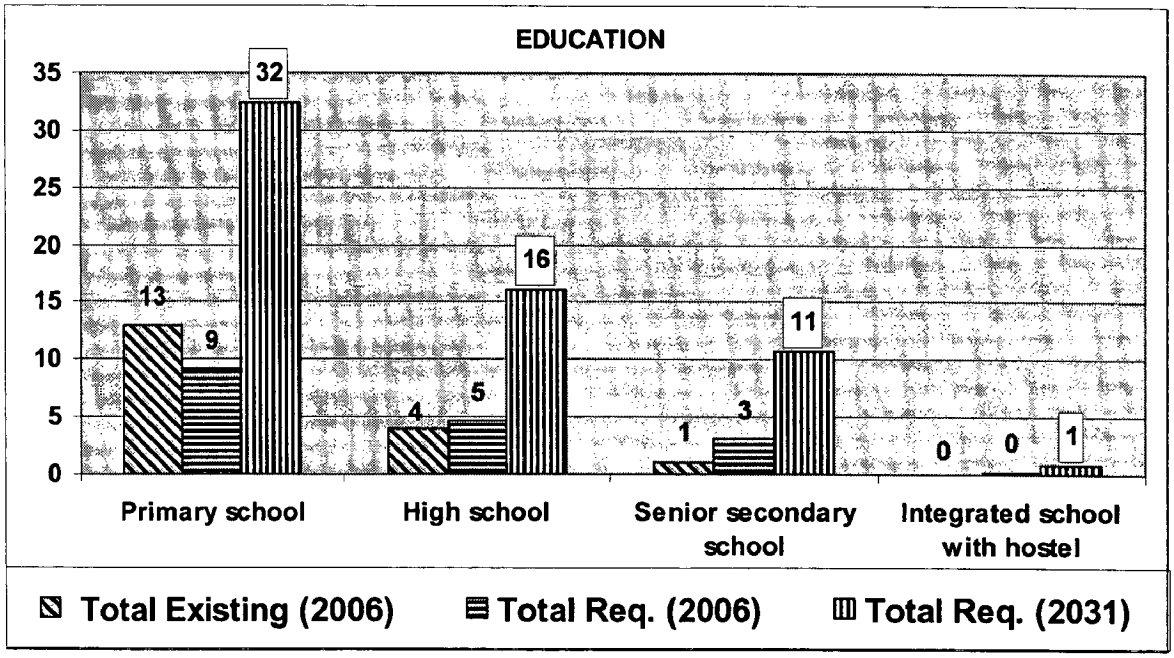
7.2.2 SOCIAL INFRASTRUCTURE

A) EDUCATION

Table 7.3: Education infrastructure – present & future demand

Amenities/ facilities	Total Existing (2006)	Total Required (2006)	Total Required (2031)	Additional Required (2006)	Additional Required (2031)
Primary school	13	9	32	-4	19
High school	4	5	16	1	12
Senior sec. school	1	3	11	2	10
Integrated school with hostel facility	0	0	1	0	1

Fig 7.3: Education infrastructure – present & future demand



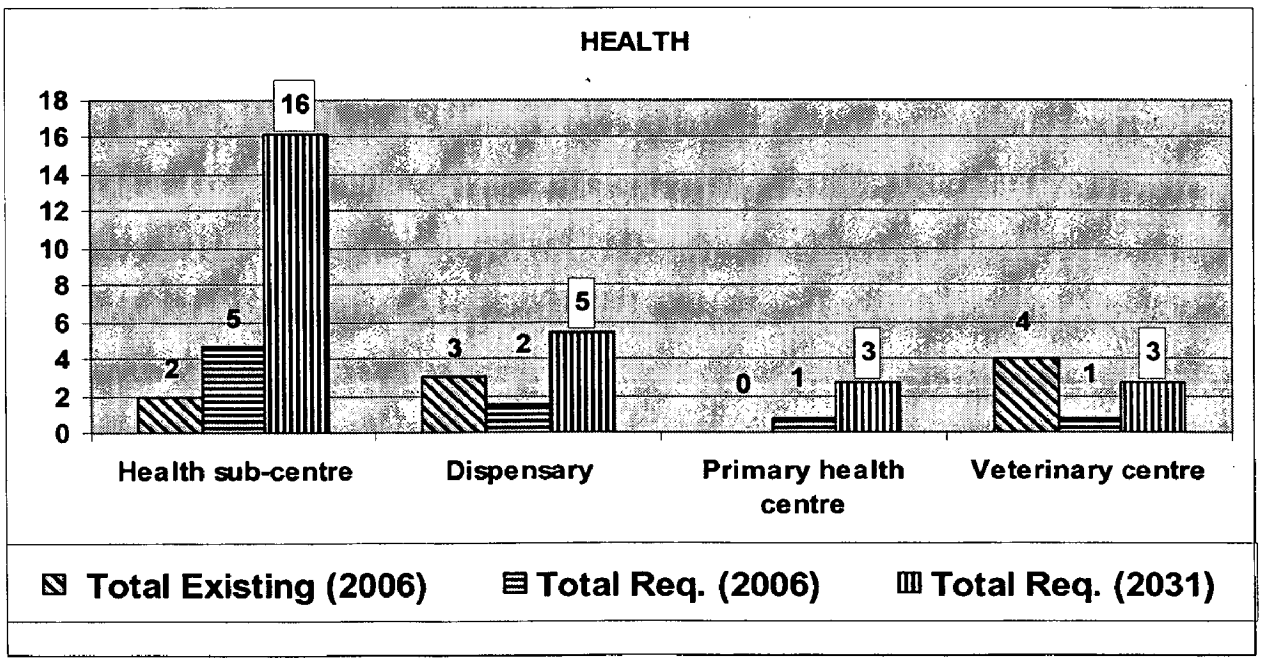
There are enough primary schools in the villages to cater the present population but shortage of high school & secondary school. The shortage can be fulfilled by upgrading the primary schools which have land available to high school & secondary school level. Further they need augmentation for the future population. There will also be need of one integrated school with hostel facility at cluster level for 2031

B) HEALTH

Table 7.4: Health infrastructure – present & future demand

Amenities/ facilities	Total Existing (2006)	Total Required (2006)	Total Required (2031)	Additional Required (2006)	Additional Required (2031)
Health sub-centre	2	5	16	3	14
Dispensary	3	2	5	-1	2
Primary health centre	0	1	3	1	3
Veterinary centre	4	1	3	-3	-1

Fig 7.4: Health infrastructure – present & future demand



Health facilities, to cater even the present population, are not sufficient. Most are forced to approach PGI, a govt. hospital. There is urgent need of three extra health sub-centres, there is no primary health center run by the government or any N.G.O. & one is needed. Although there are few private clinics but level of medical care provided by them is yet another story of dismay

But no. of dispensary are sufficient for existing population & only two more dispensaries are to be augmented for increased population in 2031. Present no. of veterinary centre will

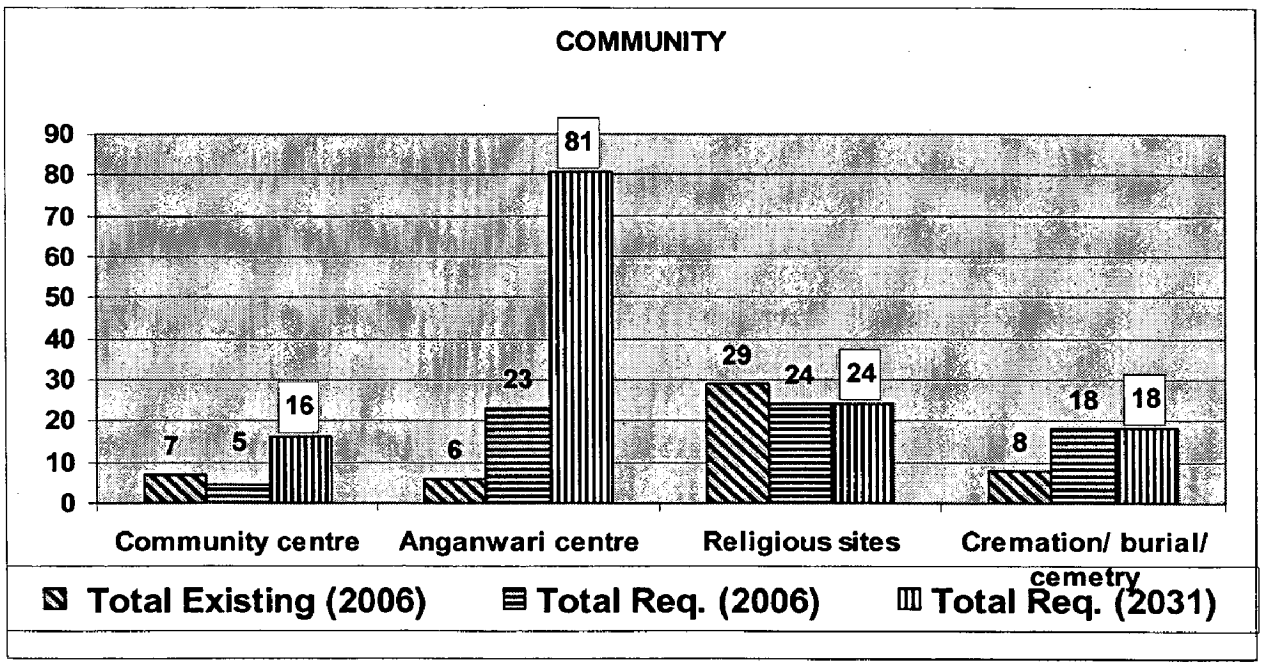
sufficiently fulfil the needs of population in 2031 also. Most emphasis for 2031 would be on health sub-centre, 14 of which will be required in the future.

C) COMMUNITY

Table 7.5: community facilities – present & future demand

Amenities/ facilities	Total Existing (2006)	Total Required (2006)	Total Required (2031)	Additional Required (2006)	Additional Required (2031)
Community centre	7	5	16	-2	9
Anganwari centre	6	23	81	17	75
Religious sites	29	24	24	-5	-5
Cremation/ burial/cemetery	8	18	18	10	10

Fig 7.5: Community facilities – present & future demand



There is a dearth of Anganwari centres even in the present & proper augmentation is needed for the future population. 9 more community centres/ panchayat ghar will also be required for 2031. There is also lack of religious sites, which seemed sufficient but are not

evenly distributed religion-wise. This is probably due to the caste system prevalent in the villages, with majority of population consisting of Hindus except village Khuda Jassu.

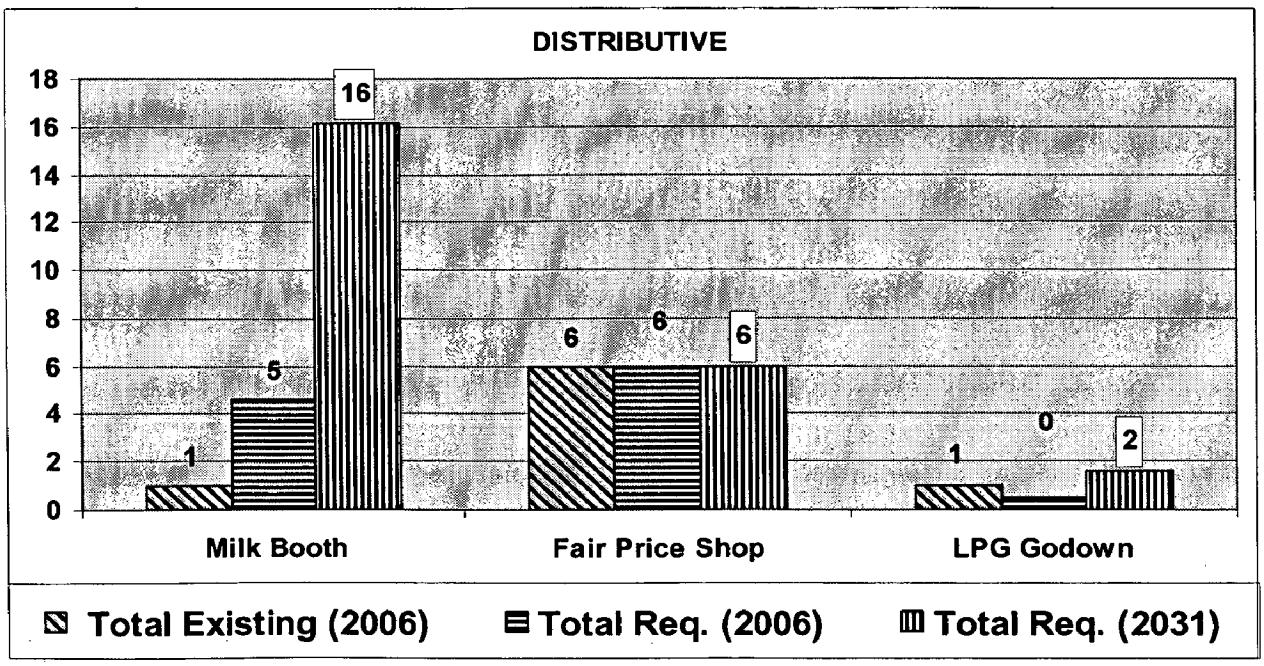
Also 'harijans' have their separate 'mandir' while the upper caste Hindus have their separate.

D) DISTRIBUTIVE

Table 7.6: Distributive facilities – present & future demand

Amenities/ facilities	Total Existing (2006)	Total Required (2006)	Total Required (2031)	Additional Required (2006)	Additional Required (2031)
Milk Booth	1	5	16	4	15
Fair Price Shop	6	6	6	0	0
LPG Godown	1	0	2	-1	1

Fig 7.6: Distributive facilities – present & future demand



The concept of milk booths is not prevalent in the villages as there are generally dairies & private cattle, which provide for the requirement, but slowly the population is shifting from

primary occupation to other. Starting planning for the milk booths will be a good option.

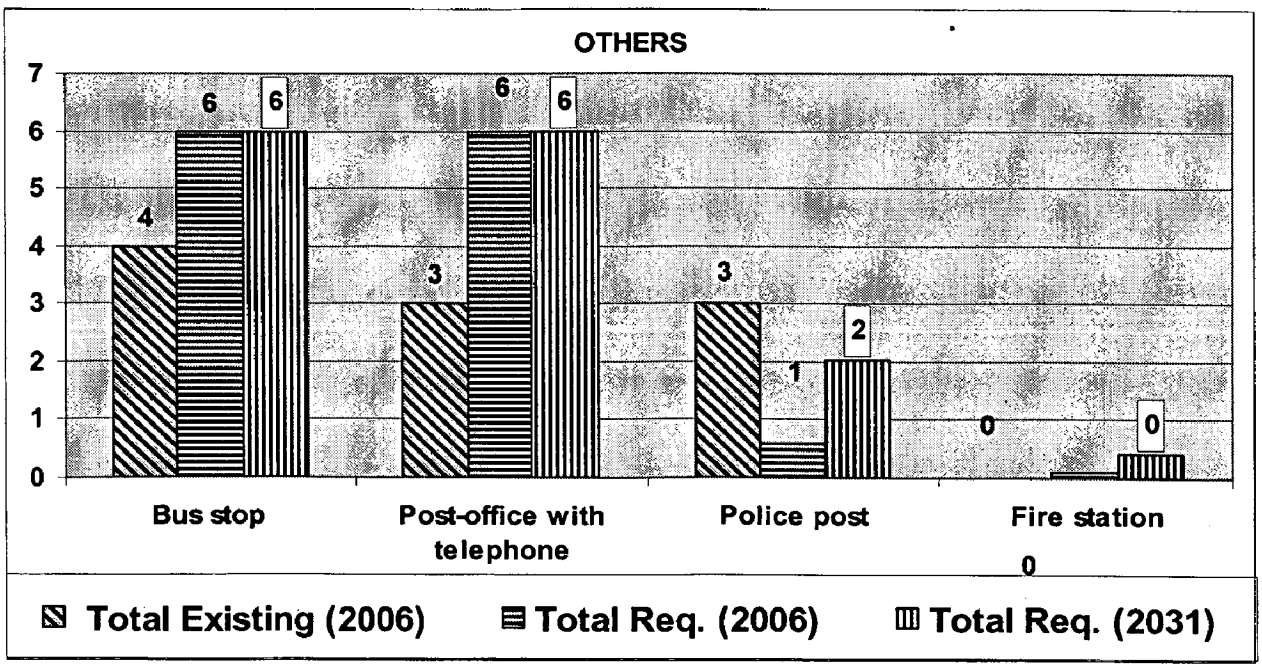
All villages have fair-price shops, where ration, kerosene oil etc is distributed on subsidized rates to the ration card holders, & are functioning properly. There is also an LPG godown in the settlement Khuda Jassu, which is catering to the villages & nearby city areas but it is located in the middle of 'abadi' area, which is dangerous & must be shifted outside.

E) OTHERS

Table 7.7: Other social facilities – present & future demand

Amenities/ facilities	Total Existing (2006)	Total Required (2006)	Total Required (2031)	Additional Required (2006)	Additional Required (2031)
Bus stop	4	6	6	2	2
Postoffice with telephone	3	6	6	3	3
Police post	3	1	2	-2	-1
Fire station	0	0	0	0	0

Fig 7.7: Other social facilities – present & future demand



Two settlements, Sarangpur & Dhanas, don't have a permanent bus stop structure although

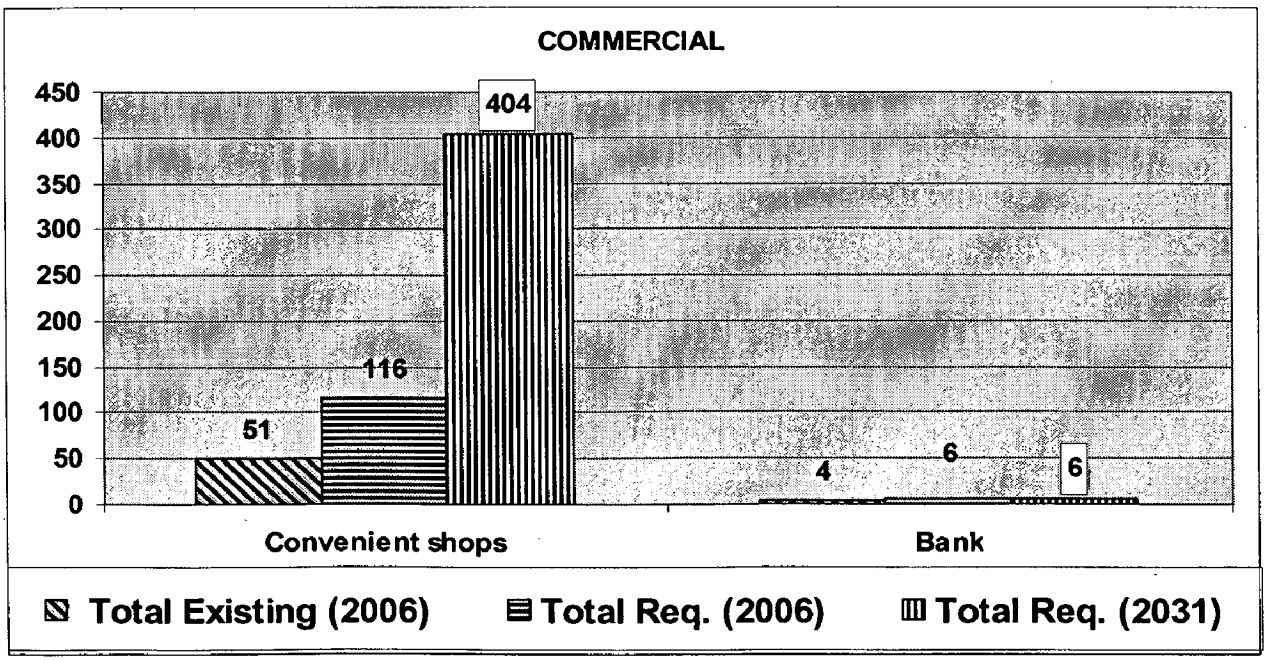
local transport buses operate through them. There is also deficiency of post –offices with half of the settlements not having it. On security front, the villages are better equipped with 3 police posts.

7.2.3 COMMERCIAL INFRASTRUCTURE

Table 7.8: Commercial infrastructure – present & future demand

Amenities/ facilities	Total Existing (2006)	Total Required (2006)	Total Required (2031)	Additional Required (2006)	Additional Required (2031)
Convenient shops	51	116	404	65	353
Bank	4	6	6	2	2

Fig 7.8: Commercial infrastructure – present & future demand



Village Khuda Lahore has no banking facility but abutting village Khuda Jassu fulfills the need for that. But village Dadu Majra is in need of opening of a banking/co-op facility. On convenient shopping front there is deficiency of shops according to standards but there provisioning mostly governed by market forces

Among the facilities discussed above, in addition to facilities at settlement level certain facilities are required to be provided for at cluster level:

- One integrated school with hostel facility
- 3 primary health centres
- One fire station
- One sports stadium would also be need to be provided catering to the 6 settlements

7.3 AREA SCENARIO

The land within the 'abadi' area of settlement is almost fully utilized for the residential purposes and sub-servant activities

The land between the settlement 'abadi' and settlement 'phirni' which was meant for public amenities and other infrastructural facilities & land beyond that is also being used for residential purposes mostly

7.3.1 DADU MAJRA

Table 7.9: Area requirement for 2031, Dadu Majra

Area under Lal Dora (2006)	Area outside Lal Dora (2006)	Total Area (2006)	Area required as per density 495 P / ha (2031)	Additional area required (2031)
4.75 ha	4.86 ha	9.61 ha	32.03 ha	22.42 ha

The population of the Dadu Majra settlement in the year 2031 would be 15830

As per the Chandigarh master plan max 495 p/ha (200 person/acre) density is allowed for rural settlements. According to this, an additional area of 22.42 ha is to be taken to provide for increase in population in 2031.

7.3.2 DHANAS

Table 7.10: Area requirement for 2031, Dhanas

Area under Lal Dora (2006)	Area outside Lal Dora (2006)	Total Area (2006)	Area required as per density 495 P / ha (2031)	Additional area required (2031)
5.25 ha	11.13 ha	16.38 ha	24.84 ha	8.46 ha

The population of the Dhanas settlement in the year 2031 would be 12275

According to this, an additional area of 8.46 ha is to be taken to provide for increase in population in 2031.

7.3.3 KHUDA JASSU

Table 7.11: Area requirement for 2031, Khuda Jassu

Area under Lal Dora (2006)	Area outside Lal Dora (2006)	Total Area (2006)	Area required as per density 495 P / ha (2031)	Additional area required (2031)
1.19 ha	6.18 ha	7.37 ha	24.40 ha	17.03 ha

The population of the Khuda Jassu settlement in the year 2031 would be 12056

According to this, an additional area of 17.03 ha is to be taken to provide for increase in population in 2031.

7.3.4 KHUDA LAHORA

Table 7.12: Area requirement for 2031, Khuda Lahora

Area under Lal Dora (2006)	Area outside Lal Dora (2006)	Total Area (2006)	Area required as per density 495 P / ha (2031)	Additional area required (2031)
2.81 ha	5.38 ha	8.19 ha	39.06 ha	30.87 ha

The population of the Khuda Lahora settlement in the year 2031 would be 19302

According to this, an additional area of 30.87 ha is to be taken to provide for increase in population in 2031.

7.3.5 MALOYA

Table 7.13: Area requirement for 2031, Maloya

Area under Lal Dora (2006)	Area outside Lal Dora (2006)	Total Area (2006)	Area required as per density 495 P / ha (2031)	Additional area required (2031)
10.88 ha	6.07 ha	16.95 ha	32.47 ha	15.52 ha

The population of the Maloya settlement in the year 2031 would be 16047

According to this, an additional area of 15.52 ha is to be taken to provide for increase in population in 2031.

7.3.6 SARANGPUR

Table 7.14: Area requirement for 2031, Sarangpur

Area under Lal Dora (2006)	Area outside Lal Dora (2006)	Total Area (2006)	Area required as per density 495 P / ha (2031)	Additional area required (2031)
6.80 ha	9.21 ha	16.01 ha	10.74 ha	-5.27 ha

The population of the Sarangpur settlement in the year 2031 would be 5305

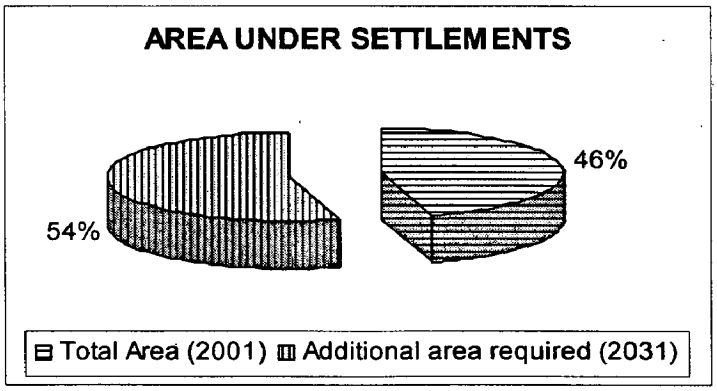
According to this, no additional area is to be taken to provide for increase in population in 2031.

7.3.7 STUDY AREA

Table 7.15: Area requirement for 2031, study area

Total Area of settlements in 2006 (ha)	Total Area required in 2031 as per density 495 P / ha (ha)	Additional area required in 2031 (ha)
74.51	163.52	89.01

Fig 7.9: Area requirement for 2031, study area



Even taking high density of 495 person/hectare (200 person/acre). The 6 settlements under study will require an additional area of about 89.01 hectares to be taken under habitation

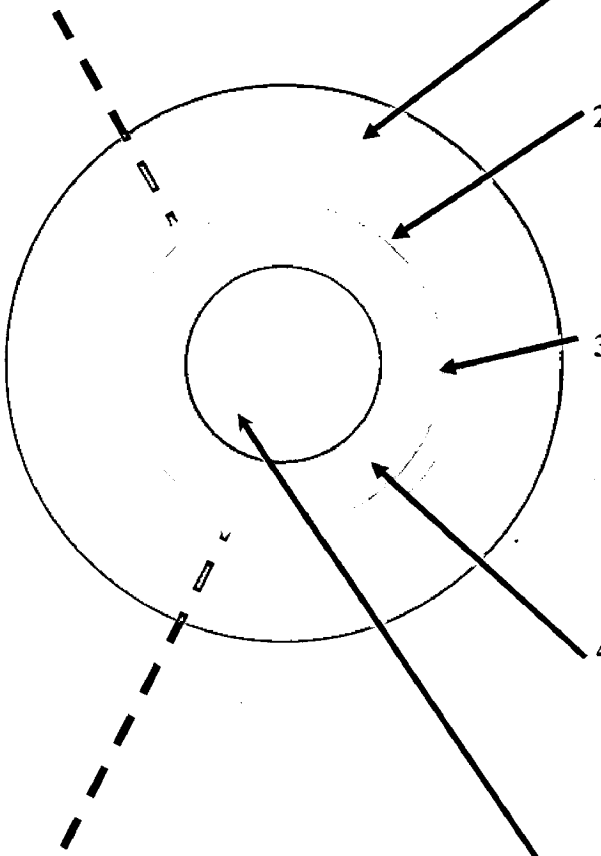
8. PROPOSAL & RECOMMENDATIONS

It is unfortunate that we are making planning and development schemes for our villages without having exclusive infrastructure plans. We fail to understand that if we don't have plans how we would be able to improve the physical and social condition of the villages even if some major economic incentives are given.

8.1 PROPOSAL & RECOMMENDATIONS

- Considering the existing as well as future development needs of the settlements under study, as well as with a view to cater to their increasing population, it would be prudent to provide a sufficiently compact and contiguous belt of land around the village "phirni" for ensuring the proper growth of these villages. This contiguous belt should be mainly treated as residential zone.
- Any area falling between the 'Lal Dora' and the 'Phirni' of the village shall also be treated as a part of the extended belt. & should be mainly developed as 'utility zone'
- To decongest the old 'abadi' area, any service or facility left within the lal-dora area should be shifted to the area between village Phirni & Lal - Dora
- Provision of the infrastructure facilities, which are lacking to cater even the present population be the first priority & should carried out immediately. For facilities, which are to cater the future population growth, an incremental approach for up gradation of these facilities should be incorporated for the development process.
- A strip of 15m outside & along the "phirni" should be treated as a no building zone/green zone" and no construction, shall be permitted therein.

Fig 8.1: Proposed Land-use zoning in a Settlement



1. **RESIDENTIAL ZONE EXTENDED-** proposed extension of abadi area)
2. **GREEN ZONE-**15m wide no construction zone/green strip, running between extended residential zone & 'phirni (Ref. Appendix 2)
3. **PHIRNI-**widened to 7.5 to provide two lanes with curbs, give access to other settlements through14 m wide minor roads or 21m wide major roads
4. **UTILITY ZONE-**or mixed land-use zone, area between 'Lal Dora' & phirni, the services & utilities will be limited to this zone only
5. **RESIDENTIAL ZONE-**old abadi area in Lal Dora

- Physical remoteness & Lack of digital infrastructure is one of the most important but neglected cause of backwardness of rural areas. Rural poverty can be reduced by providing good rural connectivity which is generally. The 'phirnis' of the village be broadened to 7.5m & connected together with shortest distance possible & good quality transport. ICT infrastructure should be provided at cluster level in the form of village knowledge centres (VKC) having mass communication systems such as telephone, community radio, internet etc., which will helps in building, maintaining and delivering the information and knowledge base to facilitate development and empowerment of the village community.

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