EVOLVING PLANNING STRATEGIES FOR NEW RESIDENTIAL DEVELOPMENTS OF LUCKNOW

A DISSERTATION

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

MASTER OF URBAN AND RURAL PLANNING

By

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CANDIDATE'S DECLARATION

I hereby Certify that the work which is being presented in this thesis entitled **"Evolving Planning Strategies for New Residential Developments of Lucknow"**, in partial fulfillment of the requirements for the award of the Degree of **Master of Urban and Rural Planning** submitted in the department of Architecture and Planning of the Indian Institute of Technology – Roorkee, Roorkee, is an authentic record of my own work carried out during the period from August 2002 to January 2003 under the supervision of Mr. Rajesh Chandra, Associate Professor, Department of Architecture and Planning, Indian Institute of Technology – Roorkee, Roorkee.

I further certify that, the matter embodied in this thesis has not been submitted by me for the award of any other Degree.

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Certified that this report entitled **"Evolving Planning Strategies for New Residential Developments of Lucknow"**, which has been submitted by **Mr. Niraj Dubey**, in partial fulfillment of the requirements for the award of Post Graduate Degree in **Master of Urban and Rural Planning** in the department of Architecture and Planning, Indian Institute of Technology – Roorkee, Roorkee, is the Student's own work carried out by him under my supervision and guidance. The matter embodied in this dissertation has not been submitted for the award of any other Degree.

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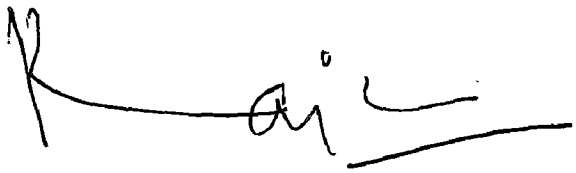

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ABSTRACT

Today, the cities all around the world are facing an unprecedented challenge; put forward by the phenomenon of urbanization and the scale of challenge is so big as never witnessed before by human civilization, in its entire history of 5,000 years. More so, the future projections make the picture grimmer. The coming time is much more crucial, as far as India is concerned, because of the population dynamics.

Among a variety of land uses, the residential land use forms the greatest part and thus needs much attention. As it has a direct bearing on the people's lifestyle and comfort, the importance is further enhanced. The residential land use is generally found to be greatest in almost all the cities irrespective of their size, layout or socio-economic conditions.

The cities are expanding enormously in search of new residential areas to serve the increasing needs of the people. The areas beyond the municipal limits, where there are lower land costs, cleaner environment, and more freedom of construction, provide good opportunity for future expansions. The private firms and societies avail this chance and start haphazard propagation of predominantly residential land use; this often has less regard to the building byelaws and development regulations.

In order to have a desired development pattern it is thus essential to anticipate these issues and have a control over the uncontrolled areas as well. There is a need to have a regulation over all kinds of residential developments in the city. The new areas should be promoted such that they have a sustainable character with respect to services and facilities instead of overburdening of the existing infrastructure load of the city and ultimately prove to be more satisfying to the residents.

The present work is an attempt to analyze the existing conditions of the recently settled residential areas, to study the processes of establishment, adopted by the government and private organizations and to explore the possibility of integrating the private and government bodies'

functions for development of new residential areas such that they have a homogeneous distribution of services and facilities and to achieve better living conditions.

Recommendations and formulation of policy guidelines / planning strategies has been the ultimate goal, which may be helpful in governing the city's development and growth pattern so as to settle well organized residential areas having considerations for all the functions that a city by virtue of its dwellers performs.

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CHAPTER 1.

INTRODUCTION:

1.1 Introduction:

Today, the cities all around the world are facing an unprecedented challenge; put forward by the phenomenon of urbanization and the scale of challenge is so big as never witnessed before by human civilization, in its entire history of 5,000 years. More so, the future projections make the picture grimmer. The coming time is much more crucial, as far as India is concerned, because of the population dynamics. [1]

At present, almost one third of total population of India is living in urban areas [2], and rural to urban migration has become a regular affair. Thus, planners of the future have to play a crucial role of planning urban centers, particularly, cities, to cater the needs of such a huge urban population. They will have to device new methods to clearly understand the process of urbanization and accordingly make planning proposals, which are adaptive to fast changing needs of the future technological and social realms.

Here in India, the resources are always scarce and various sectors compete for the priority of allocation of these resources. Thus the rigidity of the master plans makes them redundant, once priorities are shifted within a plan period. If the policies and proposals are not evaluated before implementation, undesired consequences may result in terms of unforeseen trends of development.

Our country, being one of the fastest growing and developing nations, presents several peculiarities and the cities here are entirely different from the cities of the west. Hence, it requires, on the part of Indian planners, to think of indigenous ways to deal with the problems of urban areas in Indian conditions. Western experiences can be used as a study to learn their experience, but these cannot be directly copied down to solve the urbanization problems of Indian cities. The Indian cities are characterized by conflicts and contrasts of cultures, technologies, social attitudes and behavior pattern. Even, in the decade of nineties, one can

witness simultaneous co-existence of bullock carts and highly sophisticated automobile in any typical Indian city. Similarly, problems of mixed economies, mixed land uses and mixed traffic are the inherent features of Indian cities, which make them different from the western cities.

Among a variety of land uses, the residential land use forms the greatest part and thus needs much attention. As it has a direct bearing on the people's lifestyle and comfort, the importance is further enhanced. The residential areas are generally found to be maximum in almost all the cities irrespective of their size, layout or socio-economic conditions.

The cities are expanding enormously in search of new residential areas to serve the increasing needs of the people. The population explosion and the migration are two major driving forces for promotion and upbringing of new residential areas.

With the growing resident population of a city, there is an influx of various other services and systems to cater to their variety of needs such as education, health, recreation etc. and thus establishments which complement these activities come up either simultaneously or later with time. This availability of services and facilities dictates the standard of living in the particular area and thus have a direct bearing over the over the future demands and prices.

Planning efforts are required for the sake of proper and desirable upbringing of new residential areas so that they develop in orderly and balanced manner and the problems like congestion, water logging, poor drainage, improper road widths etc may be eliminated.

Problems like these in the city core have repelled the new residents and the fringe areas of the city are being given strong consideration for living. The low land prices, better environmental conditions, lesser congestion and open areas have proved to be attractive and people have opted for these areas in spite of the large distances for accessing various facilities and services [3].

These developments have on one hand led to loss of rich agricultural land and on the other present a distorted finger like projected profile of the city along the major roads. In addition

provision of service network also proves to be difficult and inefficient along such linear developments [4].

The need of the time is to comprehend and estimate the demands considering the population growth, migration and floating population and accordingly make arrangements for them in a phased manner. There is a need to have a regulation over all kinds of residential developments in the city. The new areas should be promoted such that they have a sustainable character with respect to services and facilities so as to avoid overburdening of the existing infrastructure load of the city.

1.2 Statement of the problem:

Today cities are experiencing a rapid change. They are growing in area and population and at the same time they are acquiring a new character as the economic activity of the Indian cities is increasing in response to the overall influences of overseas trade and planning development programs. These influences are manifested individually in the cities by rapid industrialization and increased trade activity, by the expansion of governmental functions, by the construction of new housing at the city's edge; by the growth of distribution centers, and by the expansion of the automobile services in the surrounding countryside. Due to absence / lack of controls beyond the Municipal limits and lesser land values, unplanned and haphazard development starts coming up. This situation is severe in India due to the isolated approach towards the development of urban and rural economies [3].

The areas beyond the municipal limits, where there are lower land costs, cleaner environment, and more freedom of construction, provide good opportunity for future expansions. The private firms and societies avail this chance and start haphazard propagation of predominantly residential land use; this often has less regard to the building byelaws and development regulations. Later when the city authorities revise the municipal limit, these areas become a burden to them to regularize and maintain. In order to have a desired development pattern it is thus essential to anticipate these issues and have a control over the uncontrolled areas as well [3].

This phenomenon poses a challenge to the planners and the decision makers to make feel their presence in the growth process and check the undesired proceedings by imposing well-worked policies and plans which is far-reaching and comprehensive with regard to the priorities, functions and requirements.

The present work is an attempt to explore the possibility of integrating the private and government bodies' functions for development of new residential areas such that they have a homogeneous distribution of services and facilities and to achieve better living conditions. Formulation of policy guidelines for both government bodies and private promoters would be the ultimate goal which may govern the city's development and growth pattern so as to settle well

organized residential areas having considerations for all the functions that a city by virtue of its dwellers performs.

1.3 Objectives:

The following set of objectives has been framed in order to achieve the desired aim of the project:

1. To study the socio-economic and physical conditions of the selected residential areas.
2. To study the available resource and infrastructure facilities in the study areas.
3. To compare and analyze the two kinds of settlements (promoted by government and private agencies).
4. To identify the control parameters which decide the functions of the system (residential areas).
5. To evolve a suitable set of policy guidelines / strategies for future residential developments in the city.

1.4 Concept:

Observing the growth pattern of the city during the past decades, it is evident that the city has been growing in all the direction in varying magnitudes. This magnitude depends on the characteristics of the particular area like, social and physical environment, land values, distance from the city core, resale value of the property, professional and commercial opportunities etc.

All the residential areas are non-equivalent in terms of resources, infrastructure, facilities and other factors. As it is not possible to reorganize them in these terms, as it becomes difficult to achieve a rational solution in spite of heavy investments. In addition, the new developments start using the available resources of the core or other previously settled nearby areas and thus enhances the infrastructure load of the city instead of relieving it.

It is thus important to estimate beforehand the probable markets, offices, community and recreational facilities and the communication routes to the city core and to make arrangements for the same. The need of the time is to decentralize the new areas and to develop necessary infrastructure to promote growth and development.

This decentralization will not only provide a free ground to organize and develop things in an orderly manner but will also ensure a balanced functional relationship of various planning components. Efforts should be made to make the new settlement as self sufficient as possible and at the same time maintaining the overall harmony with the city's character.

1.5 Scope:

Considering the database available for the land use in the city, it is observed that the increment in the residential area has been maximum (29% in 1965 to 67% in 2001). The commercial area has shown an increment from 1.85% to 4% during the same period [5]. But the industrial sector has not shown any considerable increment. The fraction of vacant land and water bodies has come down from 31% to almost 0%. Most of the flood prone areas have been dumped with city's solid waste and have later been converted into posh residential colonies like Gomtinagar, Jankipuram and Triveninagar. The shortsightedness of unplanned development has eaten up many natural water bodies and drains and residential areas like Ramnagar, Aashiana, Malviyanagar and Eldico have replaced them [4].

More of the urban expansion has taken place in the eastern, north-eastern and northern side of the city (for example: Indiranagar, Vikasnagar and Jankipuram) and the south-eastern and southern areas have been comparatively lesser developed. The cantonment in the south-eastern side has been the boundary for the developmental activities.

According to the studies at Remote sensing center, Geological Survey of India, Lucknow, the city had an area of 42 sq.km. in 70's and at present the city area has grown up to 243 sq. km. (almost 6 times in three decades). The rate of growth suggests that in near future the city limits will cover the nearby villages and agricultural areas under various land uses [4].

The influx of more and more people in the city and the population growth has led to a higher demand of residential and other allied requirements. According to the surveys conducted by RITES in the city the number of residential units has hiked from 1.73 lacs to 4.25 lacs between the period 1981-2001 and the estimated present annual demand of 11,000 units per year [4].

The authorities have been attempting to cope up with this growing demand by supplying more and more units but the efforts have not proved to be sufficient and the private societies have played important role in this sector by developing colonies and plotted residential areas, both in the core and outskirts of the city. Although these attempts by the private societies has contributed

to the housing stock tremendously but there have been problems regarding bad service and street networks, lesser road widths and poor infrastructure facilities. And the authorities have to bear the load of these developments later when these areas are included in the municipal limits.

At present the Lucknow Development Authority and U.P. Housing Board have been considering the extensions of the residential areas at the built-up fringe of the city like- Gomtinagar, Indiranagar, Jankipuram and Sitapur road schemes. Indiranagar has a proposal to be expanded till the adjoining villages named- Ismailganj, Kamta, Chinhat, Chandan and Takrohi. Similar attempts are being tried for other residential areas at the outskirts of the city [5].

The major drawback of such expansions and developments is that these areas have always been dependent on the city core and have proved to be a burden on the city's infrastructure. The need of the time is to have a development pattern that has a sustainable character and thus provides relief to the city's infrastructure load.

Kanpur, which is considered the industrial capital of Uttar Pradesh, inspite of being just 85 kilometers apart from the city, Lucknow has not been able to invite industries to its vicinity. The administrative and political characters of the city have always dominated. But the authorities have the proposals to promote industrial sector and relocate heavy industries, which are at present operational in the residential areas. A total of 731.0 ha. Land has been proposed for industrial use. New large-scale industries have been proposed along Kanpur road [5]. It is hoped that more services and better transportation would attract the industrial sector.

Considering the probable future demands and the population growth factor, it is easily seen that the city will grow further. It is thus important to forecast and realize the new demands and to arrange the necessary infrastructure in a phased manner so as to cope up with the coming time. The city has a tremendous demand of housing as the city's character (administrative and educational center) has been continuously attracting people to come and live. The city has also been providing shelter to several people who are working in Kanpur but have chosen to live in Lucknow due to better living conditions, services and easy access to Kanpur by road and rail routes.

The planners in the coming time have a responsibility to carry out the residential development process in a channelized and systematic way so as to make Lucknow more capable, livable and sustainable city.

1.6 Need for policy guidelines:

There is an urgent need to formulate a set of guidelines, especially for the private establishments involved in mass housing and residential developments so as to ensure growth of well planned and more livable settlements. If found useful, these policies may be adopted for other cities of similar character as well.

The policy guidelines shall have an optimum level of flexibility so that the planners / decision makers (both in the government and private setup) have an option of incorporating the local governing factors and issues while planning for a particular area.

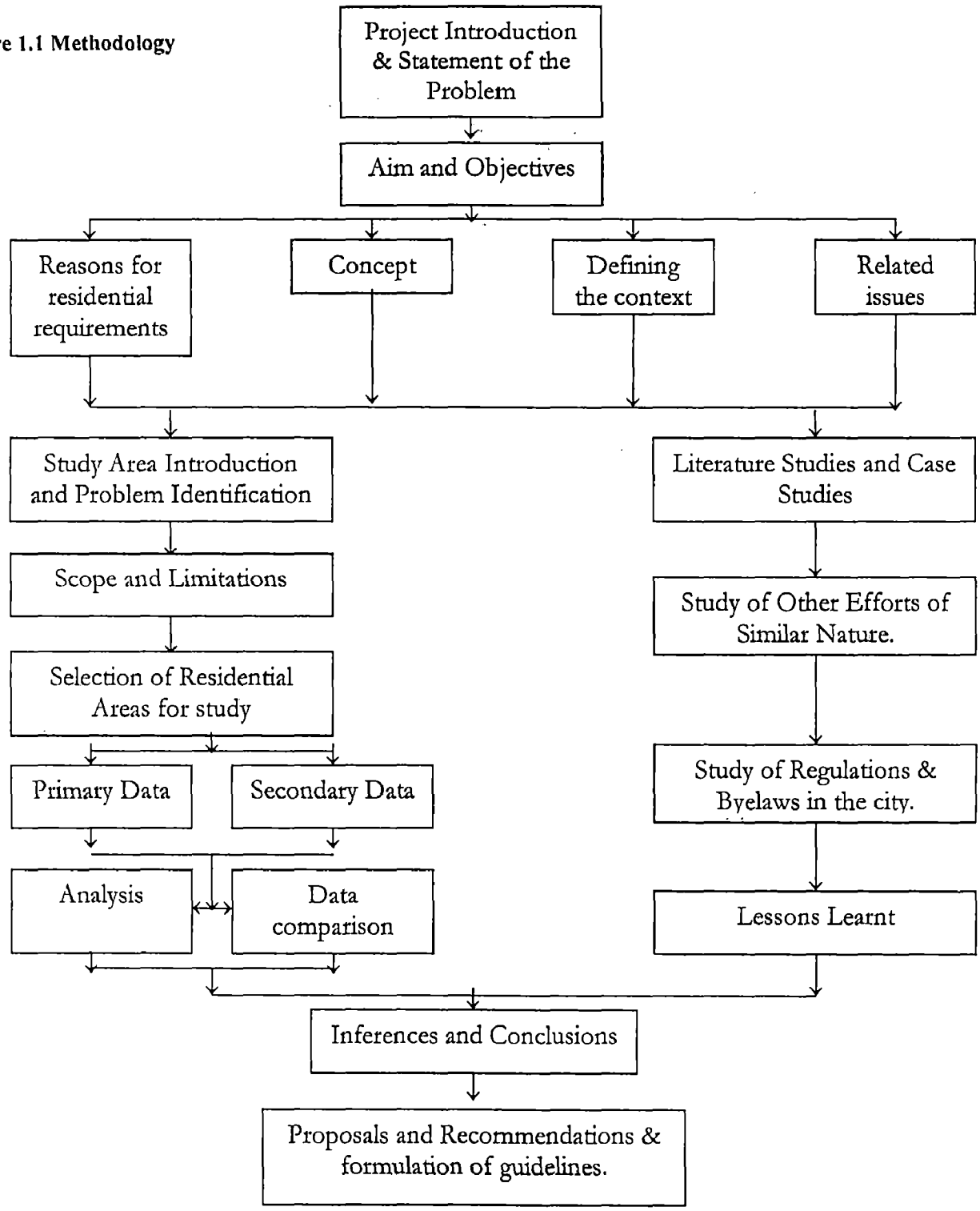
Ways to involve public participation in the decision making process and collection of feedback shall also be ensured so as to achieve a higher level of satisfaction of the future dwellers. The interdepartmental interactions shall also be dealt with.

The possibility of interlinking the private sector and the public sector for joint ventures shall be explored and suitable linkages shall be found so as to generate a system which is more efficient, reliable and capable.

1.7 Methodology:

In order to achieve the desired aims & objectives a research design has been prepared which describes the step-by-step process of formulating the policy guidelines for development of new residential areas.

Figure 1.1 Methodology



1.8 Research design:

1.8.1 Data:

To have an understanding of the existing conditions of the selected residential areas, it is essential to have data regarding demography, infrastructure, facilities and services. To achieve this primary and secondary data were collected from various sources and analyzed to reach important inferences and conclusions.

Secondary data:

The collection of secondary data was done by approaching various departments and organizations related to planning and maintenance of the city's resources. Some of them can be listed as: The Municipal Corporation, Lucknow Development Authority, National Informatics Center, U.P Town and Country Planning Department, U.P. Housing Board, Statistical Hand book and other Publications and various Websites.

Primary data:

In order to collect primary data regarding various aspects of the selected residential areas, household survey was carried out and the collected data was processed for analysis. In addition to this, discussions with the residents and officers in various departments also supplemented data collection.

1.8.2 Survey Tools and Techniques:

Preparation of questionnaire:

Considering the various aspects involved in judging the status of an area with respect to development and living conditions, a questionnaire was framed.

Modification and alteration:

The prepared questionnaire was filled and tested for shortcomings and flaws and then modified accordingly to eliminate unwanted and irrelevant issues and to include suitable issue if any found during testing.

Sampling:

Two residential areas of Lucknow city were selected for carrying out survey work and the questionnaires were filled. This selection was such as to have two kinds of residential areas into consideration – one promoted by the government and the other by private agencies. The sampling for the survey was done on a random basis.

Observations and discussions:

Personal observations and discussions with the residents of the sampling areas were also done in order to have a better understanding of their living conditions.

1.8.3 Analytical Tools and Techniques:

The collected data was then processed for analysis to obtain inferences and conclusions.

Data compilation:

The collected data was organized under various heads by putting together all the responses using computer software.

Tabulation:

The compiled data was then converted to tabulated form in a classified manner and the percentages of various responses were calculated. Bi-variable and tri-variable tables were generated depending on the relevance of one variable to the other.

Graphs and Charts:

The tabulated data was then used to prepare charts and graphs in order to make data interpretation quick and easy.

Other tools and techniques will also used for interpolation, extrapolation, trends and projections.

1.8.4 Results and Discussion:

The analysis of the compiled data tables and charts would be done to reach the results and these would then be judged on the basis of standards and future projections.

1.8.5 Findings and Inferences:

The analysis and results would lead to major findings and inferences of the study, which would be useful while making recommendations and proposals.

1.8.6 Evolution of Policy Guidelines/ Strategies:

A set of policy guidelines/ strategies would be formulated for comprehensive development of the new residential areas on the basis of the findings and inferences.

1.8.7 Recommendations:

Suitable recommendations would be made for the proper upbringing of a new residential area on the basis of the evolved set of policy guidelines/ strategies.

1.8.8 Conclusions:

The final conclusions from the study would be compiled under this section.

1.9 Limitations:

There are several residential settlements in the city having varying characteristics and living environments, and have a different set of growth governing factors and control parameters. It was not possible to cover all of them under the study, considering the time constraint and vast extent of work. Thus two of them – one promoted by the government authorities and the other by private firms/ agencies/ societies, have been taken up for study. These areas would be compared in order to have a relative status analysis and would also be compared to the standards so as to assess their appropriateness.

Thus analyzing the past attempts of residential developments, the success rates would be judged with respect to status of living and people's response. Due to short period of the project compilation, the formulated set of guidelines would not be tested for their feasibility; rather they would only be an outcome of the study.

CHAPTER 2.

LITERATURE REVIEW:

2.1 Mega Cities of India: Growth, Problems and Development Potentials [1]

2.1.1 Introduction:

All major cities of the world today are facing severe urbanization. This study has been done in order to have an understanding of the problems and issues related to the growth and expansion of a mega city.

2.1.2 Background:

The most significant phenomena occurring in India at present are massive growth of population, urbanization, metropolitanization and megalopolitanization. The last two decades witnessed a strong trend towards emergence of metropolises in India. The next decades will be a period of dominance of mega cities in the urban scene.

2.1.3 The Nature of Urbanization:

India has a unique type of urbanization, characterized by a low and stable but massive level of urbanization over a long period. It is more due to push from villages than pull from cities. The rate of urbanization, is, however, not commensurate with the area and population of India. Urbanization is not matched by adequate industrialization, modernization of economy and increase in employment level. None the less, the sheer magnitude of the urban population - 217 million in 1991 & 279 million in 2001 - is creating unprecedented problems of urban livability and urban management.

The urban population of India is the fourth largest in the world; in numerical terms it may soon emerge as the third largest. India's rate of growth of population is still high (2.1 to 2.3 per cent per annum), compared with that of China (1.6 to 1.7 per cent) and many other developing

countries. Apart from this, the urban population is growing more rapidly than the rural; and much of the urban population is heavily concentrated .in a few major cities; some of them have emerged as mega cities. This trend is likely to continue unless the forces of urbanization are redirected in a planned and regulated manner. Otherwise, megalomania will have a strong impact on urban India.

2.1.4 Emergence of Mega Cities:

A 'MEGA CITY' is defined as a city with a million or more population. The word MEGA is derived from the Greek 'Megas', which means "Great". A Mega City may, therefore, be defined as a great city with a million or more people. It was Lewis Mumford, the great philosopher and historian of cities, who in his monumental work, "Culture of Cities", used the word MEGALOPOLIS, for the giant cities and cautioned us against 'Megalomania' or a condition of insanity marked by delusions of greatness, affluence wealth, power, etc. Megalo means great and Mania means madness.

The number of mega cities in India was only 5 in 1951; by 1971, their number jumped to 9; by 1981, the number of mega cities in India increased to 12; by 1991, they were 23 in number and the 2001 census recorded 27 mega cities; an increase of almost 100 percent between 1981 and 1991 [12]. It is projected that by the year 2011, there may be as many as 35 to 40 mega cities in India. This megalomania; is likely to continue and intensify, unless population and urbanization policy planning and management are given due priority.

The Mega Cities are here to stay. Therefore, their development problems and potentials have to be analyzed and understood. Mega cities are bound to play a dominant role in the economic development of the country. Their influence will be felt strongly not only at the local level but also at the state/regional level, and even the national level. The giant cities should not, therefore, be viewed in the limited spatial context of a city or a state, but in the national perspective. Mega cities are unique and must be given special consideration. The development and the structural transformation of mega cities should be undertaken not in isolation but as an integral part of the national development process.

2.1.5 The Global Scenario:

The mega city phenomenon must also be viewed in the global context. United Nations demographers have prophesied that the 21st Century will be a century of unprecedented urban growth and emergence of mega cities. While it took nearly a hundred years (1850-1950) to double the global population from 1,300 million to 2,600 million, the next doubling, (from 2,600 million to 5,200 million) occurred in a span of less than 40 years (1950-1987). This global population reached an estimated 5.3 billion in 1990. It is increasing annually by 90 million and, therefore, our planet has entered the 21st century with almost 6.27 billion people. By the year 2011, the global population may reach 7.3 billion [13].

Bulk of the global population lives in developing countries of Asia, Africa and Latin America, Asia is the most populous continent. Though the Asian Continent is slightly smaller than Africa in area, the population of Asia is six times that of Africa. The rate of growth of this total population in the developing regions is nearly three times that in the developed regions.

2.1.6 The Urbanizing World:

Already, more countries are predominantly urban than rural. In the coming time, there will be more inhabitants in urban centers than in rural places. Asia will dominate the global picture with nearly 45 percent of the world's urban population. Not only is the total population of the world growing rapidly, the urban population is registering an even higher growth-rate than the total population. By the year 2011, the global rate of growth of urban population will be about 2.69 per cent per annum, whereas the developing region will witness a growth rate of 3.53 per cent per annum (industrialized countries: 1.8 per cent per year). In the coming decades, India, China, Indonesia and Nigeria will play a dominant role in the global population dynamics. Most of the world's Mega Cities are now in developing countries and they are growing to sizes never before experienced. The largest city is no longer New York or Tokyo, but Mexico City. The Mega Cities of the developing world (Mexico City, Rio de Janeiro, Lagos, Calcutta, Karachi, Dhaka and Jakarta) will pose more problems than Tokyo, New York, London or Paris.

2.1.7 Population Dynamics of India:

India's population in 1991 was 814.3 million. It is estimated that at present it may be over 1025.1 million. In 1991, the urban population was 25.76 per cent of the total, which at present is 27.9 per cent [13]. This is low, compared to the level of urbanization of many developed as well as developing countries. (Belgium: 97 per cent; Zambia: 53 per cent). Urbanization is expected to reach the level of 47 per cent by the year 2011; and the urban population may be about 290 to 310 million. The growth-rate of urban population was 4.61 per cent per annum during the decennial period 1971-81; and it was slightly lower (3.62 per cent) during 1981-91. The number of urban settlements more than doubled in a period of 90 years (from 1,827 in 1901 to 3,768 in 1991) [12]. This is not enough. In fact, the number of urban settlements in India is too small and not commensurate with its population and area. Too many people and too few towns and cities sums up the demographic and settlement structure of India.

2.1.8 Dominance of Large Cities:

The growth pattern of urban places in India is unique. Bulk of the urban population is concentrated in a few large cites; and they are growing much faster than smaller towns. In 1991, the Class I cities (population: 100,000 plus) accounted for 65 per cent of the urban population; and Class-V towns only 3 per cent; and in the case of Class-VI towns it was less than 1 per cent. Many class V and VI towns have shown declining trend or are stagnant. Moreover, the number of Class-I towns increased from 216 in 1981 to 296 in 1991. Out of these, 23 mega cities accounted for one-third of the urban population of India and nearly one-fourth of the population living in Class-I urban agglomerations.

Million plus population cities have continued to dominate the urban scene, accounting for 82 per cent of urban population in West Bengal, 77 per cent in Maharashtra, and over 66 per cent in Gujarat, Tamil Nadu and Karnataka. In 1951, there were only 5 mega cities (Calcutta, Greater Mumbai, Delhi, Chennai and Hyderabad). By 1961, two more cities joined the mega city rank (Bangalore and Ahmedabad). By 1971, the number of these cities rose to 9, with the addition of Pune and Kanpur to this category. In 1981, the number of mega cities reached 12, with the addition of three more cities to this dubious rank (Lucknow, Nagpur and Jaipur). During the decennial period 1981-1991, an unprecedented number -23 to be exact attained the status of the

mega city, by the joining of Surat, Coimbatore, Cochin, Vadodara, Indore, Patna, Madurai, Bhopal, Vishakhapatnam, Varanasi and Ludhiana. Thus, the number of mega cities almost doubled in a short span of 10 years. It is projected that by the year 2011, the number of megalopolises in India may rise to about 35. This is likely, because some of the large cities (Ranchi, Ulhas Nagar, Jodhpur and Vijayawada) are growing very fast since 1971.

World Bank estimated that by the year 2000, there will be 40 giant cities in the world. Out of these 5 will be in India (Mumbai, Calcutta, Delhi, Bangalore and Chennai). Mumbai overtook Calcutta between 1981 and 1991. Bangalore outstripped Ahmedabad and Hyderabad during the 1971-81 period. The population of Bangalore was almost equal to that of Hyderabad in 1991. By the year 2011, Bangalore may have a population of about 7.5 million and overtake both Hyderabad and Chennai. It will be the fourth largest city in India.

A small number of mega cities with very heavy concentration of population, and a large number of medium and small size towns with very small population base characterize India's population dynamics. This imbalanced urban population settlement structure has serious implications for generating employment, creating a sustainable economic base and delivering adequate urban infrastructure at an affordable price.

India has only 2.4 per cent of the world's landmass but more than 16 per cent of the world population [13]. The land-man ratio is extremely low, about 0.48 hectares per capital (USA: 4.14, China and Pakistan: 0.98). A large middle-class is emerging in urban India (40 to 35 per. cent). It is powerful and demanding urban utilities, municipal services and community facilities at higher levels than at present. But it has limited capacity to pay rates and taxes, necessitating subsidies and grants.

Table 1.1 Growth of mega cities in India [12].

(Population in millions)

S.No.	City	1951	1961	1971	1981	1991
1	Calcutta	4.67	5.98	7.72	9.19	10.86
2	Gr. Mumbai	2.97	4.15	5.97	8.23	12.56
3	Delhi	1.43	2.36	3.65	5.71	8.37
4	Chennai	1.54	1.95	3.17	4.28	5.36
5	Hyderabad	1.13	1.25	1.80	2.53	4.27
6	Bangalore		1.20	1.65	2.91	4.11
7	Ahmedabad		1.21	1.74	2.51	3.27
8	Pune			1.14	1.68	2.44
9	Kanpur			1.28	1.69	2.10
10	**Lucknow**				1.01	1.66
11	Nagpur				1.30	1.65
12	Jaipur				1.00	1.51
13	Surat					1.51
14	Coimbatore					1.13
15	Cochin					1.13
16	Vadodara					1.11
17	Indore					1.10
18	Patna					1.09
19	Madurai					1.09
20	Bhopal					1.06
21	Visakhapatnam					1.04
22	Varanasi					1.01
23	Ludhiana					1.01

2.1.9 The Working and Living Environment:

The massive size of India's urban population and the excessive concentration of population, investment and jobs in only a few mega cities have put a severe strain on them. The strain is evident particularly in infrastructure such as water supply, sewerage, power, housing, mass transportation and solid waste management. Air pollution in these over-sized cities is leading to serious health hazards. The decay of the central areas and the aimless sprawl of the fringes is another serious problem.

A recent study by BUSINESS TODAY on mega cities of India assessed their suitability for people to work on the basis of a multi-variate analysis, taking into consideration among other variables, the environment, cleanliness, open spaces, availability of utilities and services, community facilities and cost of living, etc. The cities were graded by an index indicating the best cities to work in. Bangalore was judged as the best city and Patna the worst city to work in. Bangalore got an index of 95 (Mumbai: 54, Delhi: 18, Pune: 17, Chennai: 15 and Hyderabad: 3), whereas Patna was given a negative index of 55 (Calcutta: 48, Surat: 23 and Kanpur: 21).

2.1.10 Greater Mumbai:

This megalopolis will gobble up a lion's share of the Rs. 84 600 crore investment envisaged, in Maharashtra. Nearly 55 per cent of the population lives in slums. Its population is expected to double during the next 20 years, thereby intensifying the mega city megalomania. Colossal deficiencies in housing, mass transportation services, power and water drastically reduced its livability and quality of environment.

2.1.11 Metropolitan Delhi:

Delhi is bursting at its seams, with 250,000 immigrants being added annually. This city, being the seat of the Union Government and the bureaucrat's bastion, is losing the legacy of Sir Edwin Lutyens and sprawling endlessly. It may have a population of about 12 million by the year 2011. It is already the third worst polluted city in the world as there are more than 2,000 polluting industries and nearly 2 million vehicles on the roads, discharging toxic, gaseous effluents into the air. Delhi is the most subsidized city in whole of India. Services like water, power, sewerage,

mass transportation and housing are severely stretched. Noise levels on main roads have reached 65 to 70 decibels, while the safe limit is 35 decibels.

2.1.12 Bangalore Metropolitan Area:

Bangalore is an example of a good city heading for disaster. The 'garden city' has become a 'garbage city'. The 'boom city' has become a `doomed city'. It has 4.8 million inhabitants; and was expected to register a population of 6.5 to 7.0 million by the year 2001. It is crowded with a density of 2,200 persons per sq.km. It has a severe shortage of housing, 75,000 dwelling units at present. While the population of the metropolis has been increasing at 7 to 9 per cent per annum, the number of registered vehicles in increasing at 20 to 25 per cent per year. In 1988, Bangalore had 4,65,000 registered vehicles or nearly 120 vehicles for 1,000 people, one of the highest vehicle-ownership levels in India. Bangalore is unique in having 72 per cent of all vehicles under the category of two-wheelers; and they emit harmful, gaseous effluents; produce excessive noise; and account for 27 per cent of all road accidents. Bangalore is said to be the third most polluted and noisy city in India, after Calcutta and Delhi.

The metropolis has an acute shortage of potable water. While the mega city needs a supply of at least 1,100 million liters of water per day, the actual supply is not more than 370 m.l.p.d., or one third of the minimum need. The sewerage system is grossly inadequate. Solid waste management problem has reached crisis proportions. The metropolis faces a chronic power shortage. Frequent interruption in the supply of power and low voltage are adversely affecting the performance of industry, trade and commerce and pumping of water. In 1960, the so-called `Garden City, had 17.2 per cent of its total area devoted to parks, play grounds and other organized open, spaces. It has now shrunk to about 10.2 per cent. In summary, Bangalore is an example of an exploding and fast-deteriorating mega city.

2.1.13 Policy and Planning Options:

The Mega Cities are too important to be neglected. A number of policy options to resurrect the mega cities and to achieve sustainable development are mentioned below.

Industries have gravitated towards mega cities. Further concentration of industries, capital and labor should be avoided, if metropolitanization and megalopolitanization have to be slowed down. New manufacturing industries should be established in new foci, away from existing large urban agglomeration, Wherever feasible, new towns may be built away from existing mega city complexes to receive industries and people, and to serve as COUNTER-MAGNETS to mega cities, The planning, location and development of large industrial, power, transport and other projects should favor backward areas; and must be considered in the regional and national context, rather than in isolation.

2.1.14 Multi-centered Spatial Structure:

India needs many more urban settlements and a well articulated, functional, hierarchical I settlement structure in which mega cities, metropolitan centers, medium-size towns, small towns and rural settlements have their respective roles to play. The multi-centered spatial order should aim at balanced development, efficiency and equity.

2.1.15 Development of Small and Medium Sized Towns:

As stated earlier, the secondary and tertiary cities of India are stagnant under the shadow of mega cities. 1t is necessary to bestow attention on small and medium sized towns, in the population range of 50,000 to 250,000 or so. Towns in this size group offer a congenial physical setting for working and living in a cleaner environment than in mega cities. The cost of expanding the small and medium size towns may prove to be less than that of building new towns or developing metropolises. The small and intermediate towns would also open up the economically depressed areas and prevent the drift of the rural unemployed and semi-employed towards metropolises. It would bring about the much-desired decentralization of industries and dispersal of industrial population. Many small and intermediate towns have growth-potential. Asansol, Kota, Raniganj, Ranchi, Purnia, Ghaziabad, Sonepat, Raichur, Davangere, Aurangabad, Solapur, Tiruchur, Cannanore, Raipur, Rourkela, Sambalpur, Bathinda, Firozabad, Muzzaffarnagar and Bulandskiahr and some of the towns which could be considered to serve as secondary cities, as they have growth potential.

2.1.16 Growth-Center Strategy:

The concept of growth-centers as a means of taking some pressure off the mega cities has merit. The National Commission on Urbanization also advocated this concept. The Government of India has recently decided to designate and assist in the development of 100 growth centers to serve as "magnets" for attracting industries to backward areas. This strategy has many benefits to offer in restructuring the settlement pattern. At the same time, it is necessary to caution that the strategy may not achieve optimum results, as in the case of 'Metropolesed Equilibria' in France, if too many urban centers are selected as Growth Centers and too little money is allocated. It is necessary to ensure that the 'Spread Effect' from induced Growth-Centers really raises employment and income opportunity levels in the lagging or declining regions to the "levels comparable to those in more advanced regions. Otherwise, the Growth-Center approach may benefit the developed areas much more than the depressed areas.

2.1.17 Development Corridors:

With industrialization and improvement in the highway and railway networks, development is tending to take place along corridors, linking the mega cities with other cities. For instance: Mumbai-Pune-Solapur, Calcutta-Asansol-Dhanbad, Delhi-Jaipur-Udaipur-Ahmedabad, ChennaiSalem-Coimbatore, Bangalore-Hubli-Belgaon, Hyderabad-Vijayawada-Machalipatnam, AhmedabadVadodara-Sprat, Kanpur-Allahabad-Varanasi and Cochin-Quilon-Trivandrum, to name only a few corridors. Many of the mega cities are being interconnected by these urban corridors.

If not properly planned, these development corridors may eventually lead to the formation of conurbations. Conurbatic growth is not desirable as it has several disadvantages. For instance, the benefits of development, economic as well as spatial, may be confined to narrow belts along the major arteries; and benefits of urbanization, industrialization and modernization of economy may not percolate into the hinterland. It may not be possible to stop development corridors; however, they can be regulated, as they serve the purpose of taking off some of the load from the mega cities.

2.1.18 Mega City Management:

One of the administrative problems, which afflict our mega cities, is the multiplicity of local bodies, often with overlapping powers, functions and jurisdictions, and fragmentation of micro jurisdictions. For instance, in Bangalore Mega City, the Bangalore City Corporation, Bangalore Development Authority, the Water and Sewerage Board, the Road Transport Corporation, the Karnataka Electricity Board, the Slum Clearance Board, the Urban Arts Commission, the Bangalore Metropolitan Region Development Authority, the Railway Board; the University, the Defense Ministry and numerous Departments of Central and the State Governments are all concerned with development and redevelopment of the metropolitan complex.

Most of the local authorities are starved for funds and technical staff. Their tax-base is weak. It is necessary to strengthen the tax-base of the Mega City. It is now being increasingly realized by some of the State Governments that it is necessary to set up an apex-level organization in major cities, with a view to coordinating the functions of various local agencies (Calcutta, Mumbai, Bangalore, Hyderabad and Chennai).

2.1.19 Legal Base for Mega City Management:

Most of the shortcomings of metropolitan management are due to lack of a comprehensive statutory framework. There is no metropolitan/mega city planning and development law as such. Whatever little effort is made to guide and regulate mega city development is based on several piecemeal statutes such as: Building Bye-laws, Zoning and Sub-division Regulations, Land Acquisition Act of 1894, Slum Clearance Act; Urban Development Authority Act, Urban Land (Ceiling and Regulations) Act, 1976, Rent Control Act, Local Government Act and Prevention of Air Pollution Act, and several other central, state and local legal instruments.

Many of these Acts and Regulations are obsolete, negative and redundant. They are counterproductive and need to be thoroughly reviewed and revised so as to make them positive, up-to-date, comprehensive and comprehensible enabling development.

2.1.20 The Prospects:

Mega cities are here to stay. They are bound to grow in number, population and area, through it is not desirable. There are no indications in India that the mega city crisis and the megalomanis will diminish in their severity, complexity and urgency. Most of India's economic expansion is yet to come in the next few decades. Therefore, the urban and regional settlement patterns are yet to emerge. The mega cities are bound to play a major role at present and in the foreseeable future.

During the next two or three decades, the predominantly rural character of the country will drastically change; and the level of urbanization will rise. Our policies and program on population, urbanization and development should be based on the realization that neither sustainable economic growth nor social equity can be achieved without a demographic balance, which depends on planned population growth, balanced population distribution, balance between urban and rural areas, and equilibrium within the urban order, comprising mega cities, metropolitan complexes, medium-size settlements and small towns.

2.1.21 Conclusion:

It is high time that development planners and decision makers in India realize that it is necessary to evolve a philosophy of urban planning and formulate a set of policies aiming at a radical redirection of mega city growth and creation of an environment which satisfies human values. They will do well to recognize that urban development, housing and environmental improvement are in themselves powerful tools in bringing about economic growth and social change at the local, state and national levels.

The probable solution options for tackling the problems of a mega city may be:

- Multi-centered spatial structure.
- Development of small and medium sized towns.
- Growth center strategy.
- Development corridors.
- Legal base for mega city management.

2.2 The Determinants of Urban Residential Land use. [6]

– Richard F. Muth

2.2.1 Introduction:

Urban problems are among the most vital domestic issues of today. There has never been a clear and detailed statement in either the scholarly or popular literature of how shortcomings in the market mechanism have given rise to today's urban problems.

The older parts of our central cities were not properly planned and regulated when they were initially developed. As a result, the demand for housing in the older parts of central cities by middle- and upper-income persons has declined, and these groups have largely moved to the suburbs. The decline in demand, in turn, has reduced the returns to owners of buildings in the older parts of cities, and these owners have allowed their properties to deteriorate. The deterioration of buildings has reinforced the flight to the suburbs. The older parts of cities have thus come to be inhabited largely by lower-income persons, who are the unfortunate victims of past mistakes and the failure of the private market to provide them with decent housing. While it would be socially desirable to redevelop large areas of our central cities, external economies and market imperfections prevent private individuals and firms from under taking this redevelopment.

2.2.2 The Pattern of Urban Land Uses and Values:

The pattern of urban land uses and values is highly complex and varies considerably from city to city. Still, some of the important features of the location of the various types of economic activity in the city and accompanying pattern of land values can be traced. The region of heaviest concentration of buildings and economic activity within a city is known as the Central Business District (CBD). It consists almost exclusively of commercial, financial, retail, and service establishments. It is generally the region of greatest employment per unit of land, and few residences are located within it. Almost without exception it contains the major railroad and intercity bus terminals, and it is the hub of the intra-city transportation system. Around its outer limits there frequently exists a region of small manufacturing and wholesaling firms.

Outside the center, housing is by far the most important type of land use. This residential part of the city, however, is by no means uniform. Close to the center, the multistoried apartment building is by far the most important kind of structure. Near the edges of the city, however, housing is usually provided mostly in the form of single family units. In between, the heights of the buildings decline and lot sizes increase. But in the agricultural region, too, the intensity of land use tends to decline with distance from the city center.

Clusters of retail and service establishments, or shopping centers, of various sizes are located in a fairly regular hierarchical pattern within the residential annulus, often at the intersections of major streets. The CBD is the largest of these centers. Finally, there are many clusters of specialized establishments surrounding institutions such as hospitals and universities.

The pattern of land values within a city is quite similar to that of building heights. Land values reach very high peaks near the center of the CBD and decline rapidly to its edges. Corresponding to the residential annulus is a region of less rapid decline in land values. Finally, in the agricultural area outside the city proper, land values continue to decline but at a still slower rate. Local peaks of values of varying heights occur near shopping centers and around special-purpose institutions such as hospitals and universities. Also, ridges or valleys of value may exist along the waterfront, rail lines, major streets, and elevations of land which are especially desirable for residences because of their topography.

Since the CBD is the point of maximum accessibility to the city as a whole and may have other advantages, transport costs tend to be lower for producers who locate there. As a result of competition for scarce locations near the city's center, those producers for whom transport costs are greatest or for whom the use of space is least important locate in or near the CBD, and conversely. For households, the CBD is the most important, though not necessarily the only, place of employment and the purchase of goods and services, and the costs of transporting people for work or shopping tend to be lowest close to the CBD. As with business firms, those households for whom transport costs are greatest or for whom the consumption of space is smallest tend to locate near the CBD, while for households for whom the opposite is true the best location is near the edge of the city. The difference in land rents between any two locations

devoted to the same type of use depends upon the difference in costs, primarily transport costs, associated with the two locations.

2.2.3 Factor Influencing Residential Land Use:

In order that a household in space with a member employed in the CBD maximize its utility, two conditions must hold. The first, that housing and all other commodities be consumed in such quantities that the marginal utility per dollar spent is the same for all, is quite well known. The second, that no small move can increase the household's real income, implies that housing prices must decline with distance from the CBD if the marginal cost of transport is positive. The second condition also implies that the relative rate of decline in housing prices must vary directly with the marginal cost of transport and inversely with a household's expenditures on housing. The empirical evidence also gives strong support to the proposition that the relative rate of decline in housing prices varies directly with the marginal costs of transport, as they are reflected by their inverse relationship with car registrations per capita.

The greater a house hold's income the greater its expenditures on housing tend to be; hence the smaller must be the price gradient at, and the greater the distance from the CBD of, its equilibrium location. However, household income differences arise largely because of differences in the hourly earning opportunities of its members and, consequently, the value they would place on their travel time. Thus, on a priori grounds alone, the effect of income differences upon a household's optimal location cannot be predicted. Empirically, however, it seems likely that increases in income would raise housing expenditures by relatively more than marginal transport costs, so that higher-income CBD worker households would live at greater distances from the city center. The average expenditure on housing would, of course, increase with distance because of the increase in income.

The decline in housing prices with distance from the CBD implies that the rental value of land used for residential purposes must likewise decline if firms producing housing services are to earn the same incomes regardless of their locations. The decline in land rentals in turn leads

producers of housing services to use more land relative to other factors of production at greater distances from the city center.

While distance to the CBD is of crucial importance in determining the intensity of residential land use, the age of dwellings and the income of their inhabitants also have an important influence. Because the marginal costs of transport for workers commuting to the CBD were greater prior to the automobile and, incomes being lower, expenditures on housing services per family were smaller, the rate of decline in housing prices was almost certainly greater.

There are a variety of reasons apart from a differential effect of income on housing expenditures and marginal transport costs why higher-income households might tend to live at greater distances from the CBD and at lower population densities. Stronger preferences for privacy or for space relative to structural features of housing are one frequently cited example. Empirically, therefore, it is quite surprising to find that population densities are no smaller, and, if anything, the value of housing produced per square mile of land is higher in comparably located higher-income areas. This probably results from so-called neighborhood effects, which raise housing prices and residential land rents in higher-income areas, for one does not find a higher proportion of dwellings in one-unit structures in comparably located higher-income areas.

Most explanations for the expansion in slum or poor-quality housing in central cities in recent years are based upon forces which influence the supply schedule of poor-quality housing. In many, the increase in the supply of poor-quality housing in the central city as a whole has resulted from a decline in the demand for better housing in certain parts of it. A variety of reasons, such as the development of automobile transportation, physical obsolescence, poor initial planning, and the failure of local governments to supply a proper level of municipal services, have been suggested to account for the decline in demand. Other explanations stress market imperfections, external economies, or shortcomings in property taxation, as forces increasing the supply schedule of poor-quality housing directly. Whatever the reason for the increase in the supply of poor- quality housing, because lower-income households might be presumed to have less of an aversion to living in poor-quality housing than higher income ones, the deteriorated areas have come to be inhabited largely by lower income groups.

2.2.4 Other Determinants of Residential Land Use:

The Age of Buildings and Neighborhoods:

Most textbooks and other writings on real estate and land economics have stressed the importance of the legacy of the past on the pattern of land use in cities. Many have emphasized that the relatively great durability of buildings means that, once initially developed, the pattern of land use in a neighborhood is fixed for relatively long periods of time. The durability of buildings is generally considered to be of such importance that the effects of current conditions are completely overwhelmed by the heritage of the past.

"The determining background conditions are insufficiently stationary in relation to the durability of buildings. In other words, each town must be examined separately and historically. The features of London, for example, can be fully understood only by investigating its past; it is as it is because it was as it was".

The pattern of land use in a particular area within a city is undoubtedly influenced greatly by the levels of transport costs prevailing at the time of its initial urban development. Of course, expected future changes affect decisions currently made through their effect upon land values. However, it is probably fair to say that few persons anticipated the great impact of the development of the automobile prior to its introduction. Transport costs, especially time costs, were much greater per unit distance prior to the auto. Because of these greater transport costs, a greater premium would have been paid for accessibility to the city center, to other concentrations of employment and the purchase of goods and services, and to rail and other routes providing rapid transport to these centers. In addition, greater transport costs would imply that housing prices have fallen off more rapidly with distance from these centers and transit routes.

Finally, the effects on housing prices of a decline in the marginal costs of transport, such as that brought about by the automobile, may be offset by a growth in population. With a growth in population housing prices will tend to rise at all distances from the center because of the relative in elasticity of the supply of urban land. In addition to its influence on the intensity of residential

development, the age of a neighborhood may also have an important effect on the kinds of households that locate in it.

The decline in quantity of housing as it ages may, too, be largely relative. Over time, as the incomes of all households tend to increase, the relatively higher-income groups might find that the quantity of housing they wish to consume has increased and move into newer, larger, and better quality dwellings than they previously inhabited. The next income class in relative terms finds the housing previously inhabited by the highest relative income group now suitable for itself, and so forth. Considerations such as these seem to form the basis for the notion of "filtering," which is so frequently belabored in the real-estate literature. Finally, newer housing may be inhabited by the higher-income groups because they have stronger preferences for, or are willing to pay a greater premium for, new housing than the lower-income groups.

Factors Affecting the Demand for Housing of Different Types:

Many factors might conceivably affect the relative demand for housing of different types and thus indirectly the pattern of urban residential land use. Among these are housing-type preferences associated with the level of a household's income, those related to its life-cycle stage, the relative cost of housing of different types, and various neighborhood effects.

If higher-income persons prefer housing made up of more land relative to structures than lower-income persons, one would expect to find income level and the per household consumption of housing rising with distance from the city center and population densities falling on this account. In addition, as incomes grow over time, one would expect the demand for housing at greater distances from the city center to rise relative to that in areas near the center and the price and density gradients to fall. It might also be argued that higher-income persons or those of higher occupational status have stronger preferences for home ownership or for single-family dwellings.

While available data suggest that the proportion of households that are home owners increases with the age of the head until middle age, they show little or no tendency for the proportion to decline among still older house holds. In addition, the housing expenditures of older households tend to be greater, especially at lower current income levels, than the expenditures of younger

households. The relative demand for single-family houses is also affected by the relative prices of housing of different types.

Finally, the relative demand for housing in various locations may be influenced by a whole host of features external to the individual structure commonly termed "neighborhood effects." Housing in the proximity of local employment or shopping centers would tend to be higher priced than other housing a comparable distance from the city center because transport costs would be lower for households locating there. On the other hand, because of unsightly appearance, noise, unpleasant odors, or traffic congestion such locations may be undesirable. If so, lower housing prices on their account may tend to offset higher prices due to superior accessibility. Other features of the city such as a university or other cultural centers or a park in the neighborhood may make location in the vicinity more desirable and cause housing prices to be greater than they otherwise would be.

As observed by Homer Hoyt and others, areas of higher-priced housing are not scattered uniformly throughout the city; rather, they tend to cluster together, frequently proceeding out from the center of the city along certain radials.

The effects of neighborhood characteristics, such as those mentioned above, on land rentals, on the output of housing per unit of land, and on population densities are quite similar to those of accessibility. As with nearness to the city center, external features which increase housing prices lead to a bidding up of residential land rentals if firms producing housing are to earn the same incomes regardless of their locations. Higher land rentals, in turn, lead to a greater output of housing per unit of land. The latter effect, by itself would tend to make population densities higher in attractive neighborhoods. But if higher income households tend to locate in these neighborhoods, the per household consumption of housing is greater and population densities smaller on this score.

2.3 Inner City Housing and Private Enterprise [7]

- Frederick E. Case

2.3.1 A New Agenda:

There are ample common qualities among the findings from the study of cities to produce a new agenda for those who want to help the inner-city under housed. Rather than stating the conclusions in didactic fashion, simply questions and commentary have been presented as a guide to those who can learn from the frontline experiences in nine western cities. If the reader really wants to do something for the under housed, these are the kinds of questions and ideas with which he should be concerned:

1. ***Are all interested parties committed to defined policies and programs and to completions that can be measured in units or by the arrival of a given date?***

Properties are built, rebuilt, rehabilitated, and managed. They are made to achieve the given ends of a particular kind of housing program through the use of hardheaded business principles and not through well-meaning but unrealistic social-goals rhetoric.

2. ***Are the business firms that intend to provide housing for low-income families motivated by profit incentive or social consciousness?***

Business firms are not capable of meeting social ends, and when they go into a housing project without a profit motive in mind, they frequently become confused in their attempt to do the kinds of things for which they are most poorly equipped. However, business firms are capable of implementing housing programs and maximizing available resources and funds that have been provided through government agencies for social ends.

3. ***Is the program intended to provide either low-cost or low-rent housing, or housing that can be provided with a low-income return?***

Housing for under housed inner-city families cannot be provided at low-cost to the families or at low rents. Nor can housing be planned so that it will be operated with a low income potential. The hard-core under housed in the inner city will have better housing only if subsidies

are provided. Unless subsidies are included and intended as a regular part of the under housed program, the programs will not meet the real needs of the hard-core under housed.

4. ***Is maximum planning being undertaken for rehabilitating or improving the existing housing stock?***

If a reasonable amount of housing is to be provided for inner-city families within the immediate future, and if very little increase can be expected in housing subsidies, then something must be done to improve the housing stock now available to inner-city populations. If rehabilitation is not possible using the inventory in a given city, then no solution to the problems of the inner-city under housed seems possible within the decade.

5. ***Are the available resources and funding being directed to the areas of greatest need or to those who can use the funds and programs most successfully?***

Too many housing programs are provided to those who really could do much more to help themselves, and too many programs are provided in cities where inefficiencies are denying maximum housing for under housed families. Greater flexibility in shifting programs and funds from areas of underutilization to areas of greatest need should be incorporated in all future housing programs.

6. ***Do we need a new kind of government housing agency, new kinds of government housing officials, and new kinds of private builders and lenders to work exclusively with the under housed families?***

The problems of inner-city under housed families today are in no way similar to the problems of depression families of the past times, and new thinking, new programs, and new policies need to be introduced as the changing socio-economic situations need due considerations. Perhaps this can only be done if a new kind of agency is created. Perhaps inner-city housing specialists of a new kind will prove indispensable.

7. ***Can a nonprofit organization really be effective, even if it is well organized?***

The secret of providing good housing in the inner city lies in good business practices. Without good business talents, there is a high likelihood that any organization will fail in its

efforts to provide inner-city housing. Particularly needed is the business ability to cut through complex, time-consuming procedures to get to the kind of answers that provide solutions, not the kind of answers that simply give birth to even more complex, costly procedures.

8. ***Should critical mass be recognized as an important principle in providing low-cost housing?***

The resources for inner-city housing are scattered so widely through so many kinds of programs that it is difficult to keep track of what is happening and there is an assumption that nothing is being done and nothing can be done. Perhaps more of the resources for inner-city housing programs should be concentrated in a limited number of programs to produce recognizable results on a scale sufficient enough to encourage others who attempt to do something.

9. ***Which would be most effective in producing housing for inner-city families: punitive measures or more profit incentive?***

Punitive measures might be tied to local building restrictions, institutional constraints on lending, building codes, fines, and similar procedures. Perhaps the same approach should be followed in providing low-cost housing.

On the other hand, the profit motive is a very powerful incentive and when coupled with certain kinds of tax incentives, it frequently produces much more return than do punitive measures. In any case, neither punitive measures nor profit incentives have been used with full effectiveness in providing inner-city housing. Mastery of the most productive combinations will result only from substantial study and experimentation.

10. ***Would more follow-throughs by those who are providing inner-city housing produce more results?***

Few agencies really attempt to report their accomplishments and their failures in providing inner-city housing. When achievement is measured only in units, no clues are provided as to the number of families that continue to be under housed or the number of families that genuinely

need the housing provided for them. Goals must be stated in terms that relate to the problems to be solved and in terms that permit measurement of results.

11. Have we placed enough emphasis on an underperforming economy?

There is a clear lack of economic and market participation by the inner-city under housed. If we accept one of the basic assumptions of our society—that everyone can be made a productive member of society—then perhaps an under producing population may simply be a symptom of an under producing or misdirected economy.

12. Should we treat symptoms or basic causes for under housing?

For under housed families, this question is irrelevant. Technology and financing can deal with symptoms, while education and employment can deal with causes. If we are to make serious and immediate inroads on the problems of under housed inner-city families, we clearly must make use of every means available.

2.4 The Process Adopted by the Government Authorities While Setting Up a New Residential Area:

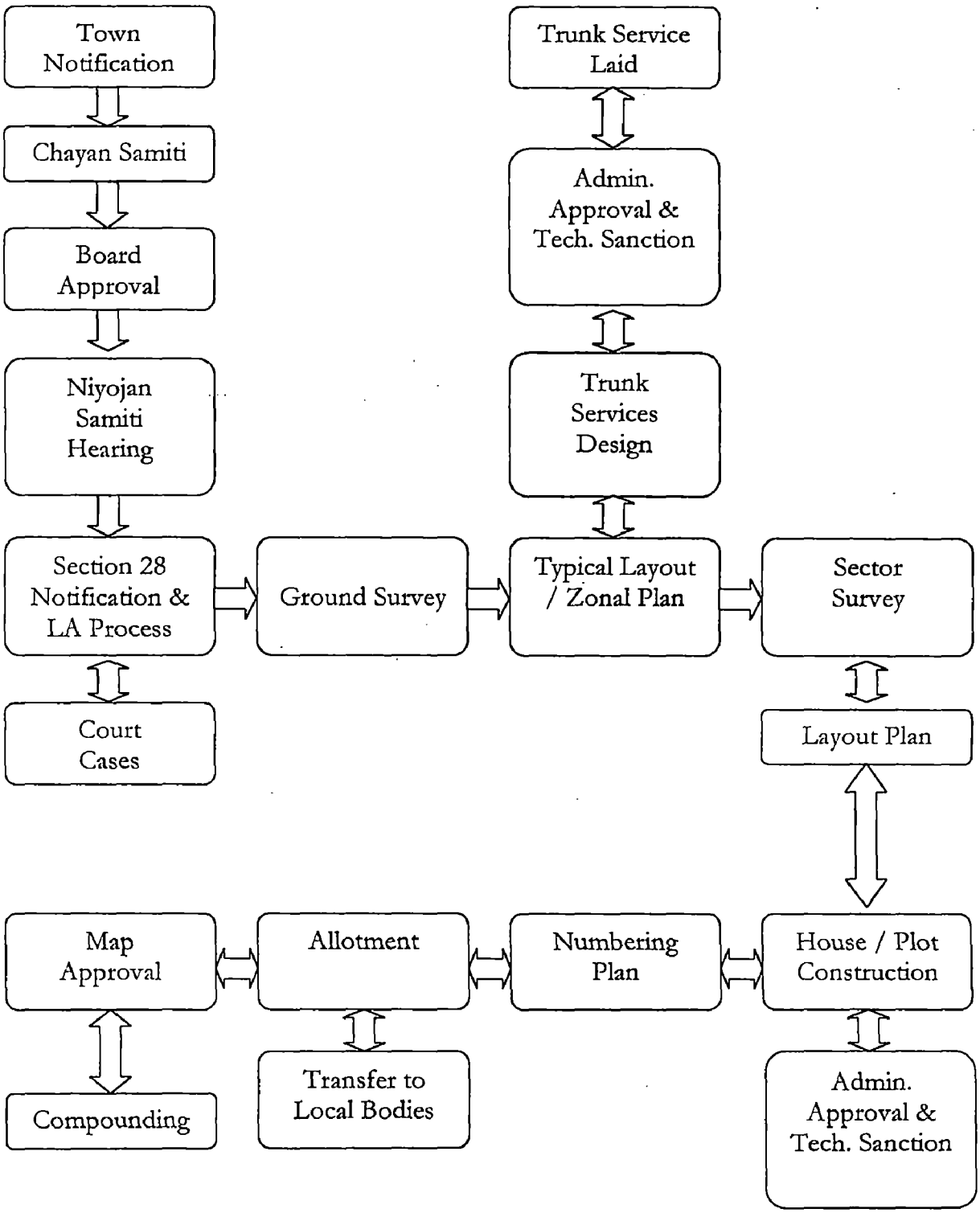


Figure 2.1 Process adopted by Government agencies

* Source: U.P. Housing Board, Lucknow.

Inferences:

1. First of all a public notification is made indicating government's intension and purpose for requirement of land acquisition.
2. A Chayan Samiti (selection committee) is constituted, which visits the land parcels under concern and proposes the board the names of the areas for further consideration.
3. The board approves certain areas to be acquired after discussions under the light of various influencing factors.
4. The Niyojan Samiti (planning committee) then confirms the localities selected and check for suitability before giving the final verdict.
5. The owners of the selected land parcels are then notified under section 28 of the Land Acquisition Act. The process of land acquisition involves claims, verification and payment of compensation of valued price of property to the land owners. In addition, the court cases are also dealt with, which may be confronted as a result of dispute on the valuation of the property for compensation payment.
6. Ground surveys are then carried out for the sake of planning and calculations.
7. The next step is the preparation of the typical / zonal plan. This plan is especially useful for the design of trunk services. These services are laid on-site after the administrative approval and technical sanction.
8. Sector surveys are then carried out to provide a base for the preparation of the sector plan and subsequently, sector wise layout plans are made.
9. The sectors are then divided into plots as per the layout plan and houses are constructed. This again involves administrative approval and technical sanction.
10. In order to make clear the system of layout and for the sake of identification, a plan is prepared, which is called the numbering plan.
11. The properties are then allotted to the owners as per the system evolved by the authorities. The map of the buildings is simultaneously approved and compounding done as and where required.
12. The final step is the handing over of authority of the built-up residential area to the local bodies for maintenance.

2.5 The Process Adopted by the Private Firms:

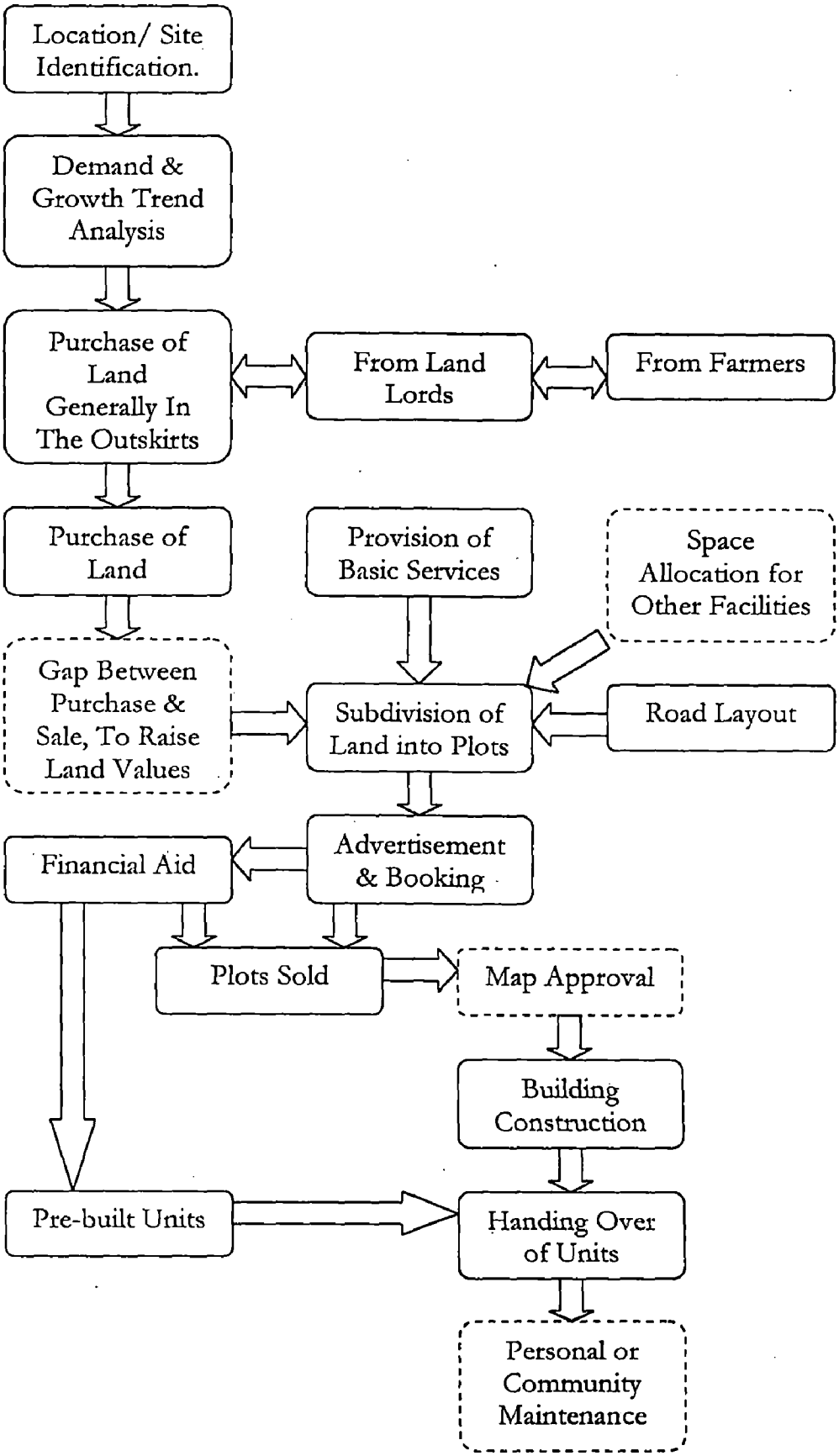


Figure 2.1 Process adopted by private agencies

Inferences:

1. The private developers first identify a location for housing development on the basis of several factors like, prevailing land costs, market demand, trends of growth etc.
2. The land parcels possessed by various land owners and farmers are then purchased by negotiation and bargaining. The locations at the periphery of the city offer good opportunities in terms of low land costs and greater scope of development.
3. The private developers generally start construction or selling process at a stage such that they get maximum benefit of the raising land values.
4. At the starting of the selling process, the land is subdivided into plots and roads are laid. This is to be accompanied by the provision of the basic services and facilities but the developers have often been found to be ignorant about this aspect.
5. The advertisement and booking of plots/ spaces is the next step.
6. Options of pre-built houses or vacant plots are often available and there are provisions for direct purchase or with the help of financial aid.
7. In between lies the process of map approval, which is often not given attention neither by the developers nor the owners. This on one hand proves to be profitable to the developers, but on the other leads to creation of sub-standard residential colonies.
8. After the handing over of the pre-built houses or the plots, when the buildings have been erected, there arises the question of maintenance. The maintenance of these areas is either done by the developers themselves or the inhabitants on a community basis. The residents of the locality contribute in a combined manner.

2.6 Planning Standards for Residential Use [8]: (LUCKNOW CITY)

2.6.1 General Land use Distribution (% distribution):

Table 2.1 Land use distribution standards.

S.No.	Use	Percentage
1	Residential area	55 – 60
2	Amenities	25 – 22
3	Roads and circulation	20 – 18

* Source: U.D.P.F.I. standards

2.6.2 Open spaces:

The open spaces shall be provided @ 0.3 hectare per 1000 population. This can be in the form of tot-lots, parks or playfields.

2.6.3 Landscaping:

1. Plantation shall be done along one side of the roads having width 9 meter or more but less than 12 meter. For the roads of 12 meter width, plantation shall be done along both sides. The trees shall be planted at a maximum interval of 10 meters. For the roads having greater widths, all the land except that for divider, footpath and black top shall be utilized for plantation.
2. Community facilities, play fields, open spaces and parks shall have at least 20% area under greenery and plantation shall be done @ minimum 125 trees per hectare.

2.6.4 Roads and drainage:

1. Roads up to 200 meters long shall be at least 9 meters wide, for 201 – 400 meters length 12 meter, for 401 – 600 meters length 18 meters and for lengths greater than 600 meter the width shall be 24 meters.
2. Loop streets shall be at least 9 meters wide and at the most 400 meters long.
3. The 9 meters wide roads which abut a park / green space may be 7.5 meters wide.
4. For the dead end streets having 9 meters width and are straight, cul-de-sac with minimum radius of 7.5 meters shall be provided and the length of such a road shall not exceed 100 meters. But for streets up to 25 meter lengths, cul-de-sac is not required.

5. For the housing schemes for economically weaker section and low income groups, the motorable roads shall be at least 6 meters wide. Pedestrian paths if abutting properties on both sides shall be minimum 4.5 meters and 3 meters in case of open space on one side and properties on the other. The maximum length of a 3 meter wide street shall be 50 meters and that for 4.5 meters wide street shall be 80 meters. No residential unit shall be located at a distance greater than 150 meters from a 9 meter wide road.
6. Widths of other roads shall be as per the provisions of master plan / zonal plan.

Road intersections:

1. The roads shall be made to intersect / meet at 90 degrees as far as possible and the center lines of all the roads meeting at an intersection shall be aligned.
2. The roads meeting at an angle of 30 degrees or less shall be permitted only if proper traffic control is ensured and sufficient viewing length is available.
3. There shall be sufficient viewing angles at the road intersections.
4. At the meeting point (metal portion) of the roads up to 18 meters width, rounded edge of at least 4.5 meters radius shall be provided. For the roads of greater widths, this radius shall be 6 meters.
5. For the roads of widths lesser than 18 meters, the distance between two T- junctions shall at least be 2.5 times the width of the wider road meeting at the junction.
6. For the roads of widths greater than 18 meters the minimum distance between the intersections shall be as follows:
    a. For roads 18 – 24 meters wide: 150 meters.
    b. For roads wider than 24 meters: 300 meters.

Calculation of road lengths:

The road lengths shall be calculated from the point where it meets a wider road.

Block length:

Residential blocks shall not exceed a maximum length of 200 meters.

Drainage provision:

For the purpose of drainage the drains shall be an integral part of the road network and the slope shall be maintained such as to ensure natural flow.

2.6.5 Community facilities:

The community facilities based on the population shall be provided as per the master plan or as follows [5]:

Table 2.2 Services & facilities standards.

S.No.	Facilities	Standards	Estimated area (per unit)
1	**Educational:** 1. Nursery and primary school.	1 unit per 4000 population	• 0.5 Ha for medium density areas. • 0.4 Ha for high density areas.
	2. High school/ intermediate college	1 unit per 15,000 population	• 1.8 Ha for medium density areas. • 1.5 Ha for high density areas.
	3. Degree College.	1 unit per 80,000 population	• 4.0 to 6.0 ha area.
2	**Medical:** 1. Health center.	1 unit per 16,000 population	1.0 ha area (with staff quarters)
	2. General hospital.	1 unit per 80, 000 population	4.0 ha area (for 200 beds, with staff quarters, residences and watch guard)
3.	**Commercial:** 1. Convn. Shopping.	5,000 – 6,000 population (1 unit per 400 population)	Not more than 15 shops at a place.
	2. Local / sectoral commercial center.	15,000 - 20,000 population (1 unit per 200 population)	
	3. Sub- district center.	60,000 – 1,00,000 population	
	4. District center.	3 lacs – 5 lacs population.	
4.	**Telecommunications and other essential services:** 1. Sub post office.	1 per 10,000 population.	40 sq. m.
	2. Electricity sub station	1 unit per sectoral commercial center.	144 sq. m. (12 m X 12 m).
	3. Police post (with staff residence).	1 unit per 50,000 population.	0.8 ha area.
	4. Police station (with staff residence).	1 unit per 20,000 population.	0.4 ha area.
	5. Fire station.	1 unit within 5 kilometers radial distance.	
5.	**Social and cultural facilities:** 1. Religious building.	1 per 15,000 population.	0.8 ha area which is at least 60 meters apart from any road intersection.
	2. Community hall & library.	1 per 15,000 population.	0.3 ha area.
	3. Cinema hall.	1 per 25,000 population.	0.3 ha area along the sectoral commercial center or sub district center or central commercial facilities but not in the residential zone.

* Source: Lucknow Master Plan 2001.

2.6.6 Plot dimensions:

The land used for residential purpose shall have a minimum area of 40 sq. m. and a minimum width of 3.5 meters. For economically weaker sections, low income groups, slum clearance schemes or industrial worker's housing schemes the minimum allowable size may be 25 sq. m. with 75% ground coverage and provision of cluster open spaces. Similarly, the plot sizes of 15 sq. m. with 100% ground coverage are acceptable if proper light and ventilation provisions are ensured.

2.6.7 Setbacks for residential buildings:

The setbacks for residential buildings as high as 10 meters shall be as follow:

Table 2.3 Setback standards

S. No.	Area of plots (sq. m.)	Setbacks (in meters)			
		Front	Rear	Side -1	Side -2
1	Up to 50	1.0	-	-	-
2	51 – 100	1.5	1.5	-	-
3	101 – 150	2.0	2.0	-	-
4	151 – 300	3.0	3.0	-	-
5	301 – 500	4.5	4.5	3.0	-
6	More than 500	6.0	6.0	3.0	1.5

1. Construction shall be allowable on 40% area of the rear setback with a maximum height of 7.0 meters.
2. For corner plots the rear setback shall be same as the front setbacks of the plots along the road at the back. If no plot has its front along the back road the front and rear setbacks shall be the same.
3. In case of the number of plots (bigger than 300 sq. m.) being odd in a block the corner plots shall be kept wider so as to provide space for leaving equal setbacks on front and rear.
4. If any plot within a previously developed area/ scheme is sub divided, the setback along the major road shall remain the same.
5. Above setbacks shall be applicable to new sub division / layout plans.

2.6.8 Ground coverage and F.A.R.:

The maximum ground coverage and FAR for residential buildings (plotted) shall be as follows:

Table 2.4 Ground coverage and F.A.R.

Plot area (sq. m.)	G.C. (%)	F.A.R.	Free units (nos.)	Additional units (nos.)	Total units (nos.)
Up to 50	75	2.0	2	-	2
51 – 100	75	2.0	2	1	3
101 – 300	65	1.75	3	2	5
301 – 500	55	1.5	4	2	6
> 500	45	1.25	4	4	8

2.7 The housing scenario in the city:

At one time, Lucknow was the biggest and the most beautiful city in the Indian continent. It was razed to the ground during the first war of Independence (1857) when the population of the city was reduced from five lakhs to one lakh. After a century, the city crossed the population level of five lakhs again. In the 1961 census the population of this city was reported as 6.6 lakhs, which was spread over a stretch of 135 sq km along the banks of the river Gomti. At that time, just 20 per cent land was under residential use. It was a low density, no pollution city with a lot of greenery in and around [9].

At that time, with the ideal situation of one dwelling unit for one household (five persons), the city was short of just 2820 dwelling units. But by the year 1991 the population touched a mark of 17 lakhs and the shortage of dwelling units jumped to 63,269 units. It is estimated that during the current decade (1991-2001) 1,88,050 additional dwelling units will be needed to provide one unit to each household of five persons. Yet the way things are, it is a definite mirage to achieve in the times to come [9].

Physio-graphically, Lucknow is located such that it can expand horizontally to any extent without any obstruction. Exercising this option, the city expanded from 135 sq km to 337 sq km in the span of 30 years. In this development process the Lucknow Development Authority (LDA) played a major role by developing about 6000 acres of land under its various housing schemes. The Uttar Pradesh Housing Board (UPHB) also contributed in the process by developing another 2412 acres of land under its housing schemes. Consequently, the decade 1981-91 was marked with a flow of people settling on the new locations in the housing schemes developed by these two public sector agencies. In this period the UPHB was instrumental in adding 42,042 dwelling units and the LDA over 60,000 dwelling units in the housing stock of the city [9].

This period was also marked by a steep escalation in the cost index of the dwelling units. In this period the rates of dwelling plots developed by these public sector agencies multiplied 20-33 fold and properties in the other sectors also followed the pace set by the market leader. With this, the problem of housing limited to the issues of 'availability' got added up with a more stressing problem of 'affordability'.

The responsibility for this can be attributed to the public sector agencies that operated in an absolute monopolistic manner with an unclutched state authority behind them. During the period 1977-1992, the rate of development inputs multiplied at the most five fold but in the same period the rates of dwelling plots developed by the housing board at the Indira Nagar scheme multiplied 20 fold. Similarly the rates of plots developed by the LDA in the Aliganj scheme multiplied 23-33 folds in the period 1980-95, whereas during this period the rates of development inputs just quadrupled [9].

In the same period a third dimension was also added to the housing problem, that was 'acceptability' in terms of quality, which too dipped under the stride of the monopolistic operations of these public sector agencies who took up the dwelling construction works directly in their hands which was absolutely unwarranted.

Consequently the thrust on the horizontal expansion slowed down after 1991 owing to which, experimentation with high-rise housing got a flip in the city. Probably the key factor behind this shift was the realization of the people that the newly created housing schemes lacked basic security and were more prone to crimes like theft, burglary, dacoity etc. The second factor could be the absence of an attempt for a structural adjustment of the city for integrating the new schemes with the city to ensure the continuity of urban dynamics. The third factor is the realization by the development authority of the disillusionment of the common man with their operation, and finding it tough to operate, they tried to tap private builders through the extensive construction of high-rise dwelling units.

With the thrust for housing development diverting from a horizontal expansion to a vertical growth, a number of high-rise apartments piercing the serene skyline of Lucknow made their presence felt. But the magnetism of these could not hold for long. A number of such apartments are lying vacant and a number of projects are lingering on in search of buyers. These apartments could succeed only in attracting the corporate sector and companies who preferred them for their guesthouses as well as for their staff accommodation and offices.

The middle class demography, which dominated in Lucknow, rejected it with three major considerations - inability to pay the total cost in a short span, no scope to add on in the future and unwillingness to pay exorbitant maintenance costs lo a common pool throughout their life. The lower income group and economically weaker section cannot even dream of it. The rich ones who can afford it prefer to remain holed in their traditional abodes located in the narrow lanes and by-lanes of the old city, where they find themselves more secure from the unwanted elements of society and probably away from the eyes of the tax people. Also, the feel of community living with a lot of sharing and caring as the traditional legacy, does not allow them to move out.

Though the neo-rich, migrants and bureaucrats have dominantly settled in the Gomti Nagar schemes of the LDA, the lanes of Raja Bazar Chowk, Asharfabad still remain a paradise for the traditional wealthy of Lucknow. The aroma and fragrance of the city compels them to live there, because the old city has a soul which is alive, though its face may have wrinkles, whereas the new areas may have a better and young face, yet the soul of Lucknow is not there. 'Availability', 'acceptability' and 'affordability' jointly made the accessibility of a shelter more remote for the common man, which then led to the growth of slums. In Lucknow till 1991, slums were almost absent, but suddenly during the last five years they have mushroomed and are spreading like cancer all over. The slums which started from the culvert banks, - passed on to river banks, parks and even the abutments and parks along the main roads are not free from them. If the presence of slums is the signature for an Indian metro city, then Lucknow now is definitely graduating from a clean and caring metropolis to a metropolitan city.

CHAPTER 3.

3.1 Study Area Profile: Lucknow city.

3.1.1 General:

Lucknow, the capital city of Uttar Pradesh has been selected for the present study. It lies on the bank of river Gomti that divides the city into two unequal halves, the southern half being larger than the northern.

It is believed that Lucknow derives its name from Lakshmana, the brother of lord Rama. This theory is supported by the presence of a mound called Lakshmana Tila which lies on the north-western boarder of the city. Another story attributes the name of the city to an architect called Lakhna who constructed a fort for the Sheikh rulers under whose regime the region was during the 15th century. However, the fort, which was known as Lakhna Quila, no longer exists [10].

Lucknow is in fact one of the few traditional cities that display the full glory of Mughal and British architecture in India. Associated with the lavish culture of the nawabs, the city is a capsule of styles depicting a distinct aesthetics of scale, proportion and ornamentation. But unfortunately the city planners have failed to guide the urban growth and to preserve the precious heritage.

The character of the city is various but still unique. On one hand it has Chowks as centers of hub, which recall the sensitivity of past days and on the other there are new district nodes and growth centers, which have no respect to the context. To have a better understanding of the city's profile, studies have been done under the following heads.

3.1.2 Historical background:

The urban character of Lucknow, known in earlier times as the city of gardens can best be understood as a consequence of social, political and cultural paradigms that percolated into the city structure ever since the invasion of Mahmood Ghaznavi in AD 1031. The Rajputs left

further impressions on the city. Sheikhs, Pathans, the Mughals in the sixteenth century and subsequently, the rulers of Oudh ruled the city. Nawab Asaf-ud-Duala, in 1775, moved the capital from Faizabad to Lucknow and made it one of the most glittering cities of India. Finally, the British in the nineteenth century took over the reign.

From the point of view of urban character, two significant and unique changes took place as a result of these historic processes. Firstly, as different ruling powers took control of the city in different periods, each left its impression in different parts of the city through a different urban ingredient. Whereas the nawabs gave the baghs, ganjs and imambaras to the western and southern parts of the city, the Britishers gave the cantonment and railway station to the east and south, respectively. Secondly, as a consequence of these different powers, there has been a layering process whereby the new power overlaid another fabric over the preceding one.

3.1.3 Physical characteristics:

1 Geographical location and regional setting:

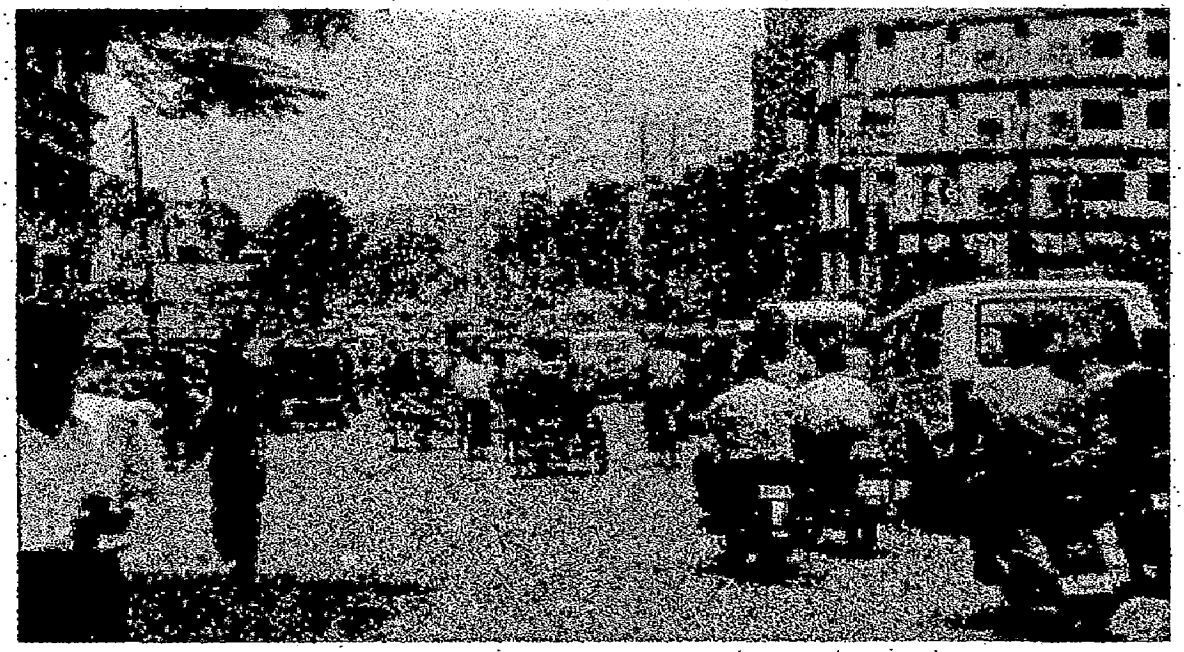
Lucknow, the capital of Uttar Pradesh is situated 123 Mts. above sea level. It is situated on 26.30 & 27.10 North latitude and 80.30 & 81.13 East longitude. It is surrounded on the eastern side by District Barabanki, on the western side by district Unnao, on the southern side by Raebareli and on the northern side by Sitapur and Hardoi districts. River Gomti flows through the city. Some of the tributries of this river are Kukrail, Loni,Beta etc. Sai river flows from the south of the city and in the east enters district Raebareli. Lucknow is accessible from every part of Indiathrough Air,Rail and Road. It is directly connected with New Delhi, Patna, Calcutta, Mumbai, Varanasi and other major cities by Amausi airport. Similarly city is linked to north, east, south and west through rail and road links. Infact rail link joins Lucknow to Pakistan via Amritsar in the west and to Bangladesh railways in the east [5].

Lucknow Railway Station

Bus stands being misused

Newly introduced battery driven autos

Aminabad market



The traffic load

2 Physical features:

The most prominent feature of the city is the river Gomti that divides the city into two parts. The city started to develop initially along the right bank of the river and then with time covered both sides. A large part of the city is low lying and the area was very prone to floods before the construction of retaining walls on either side throughout the city [9].

3 Climate:

District Lucknow has almost uniformed tropical climate. The temperature varies from 45 celcius maximum in summer to 5 celcius minimum in winter season. Rainfall is 100 cm. per annum. The forest area is negligible in the district. Shisham, Dhak, Mahua, Babul, Neem, Peepal, Ashok, Khajur, Mango and Gular trees are grown here. In fact different varieties of mangoes specially Dashari are grown in Malihabad block of the district and exported to other countries too. The main crops are wheat, paddy, sugarcane, mustard, potatos, and vegetables such as cauliflower, cabbage, tomato, brinjals are grown here. Similarly sunflowers, roses, and marigold are cultivated on quite a large area of the land. Apart from this many medicinal and herbal plants are also grown here. The prominent wind flow direction is along north west or west during winters and along east during the summers [11].

4 Land use pattern:

The land use scheme of Lucknow city as proposed in the master plan 2001 is as shown in the figure. The master plan prepared in 1965 was a translation of untested planning theories being propagated at that time with a strong reflection of the Delhi model. The thrust was on rigid zoning to achieve an ordered land use pattern. The approach was to keep the existing city as the hub and to expand in all direction along the major transportation routes without any consideration for the urban dynamics, forms and socio-economic aspirations of the society [5].

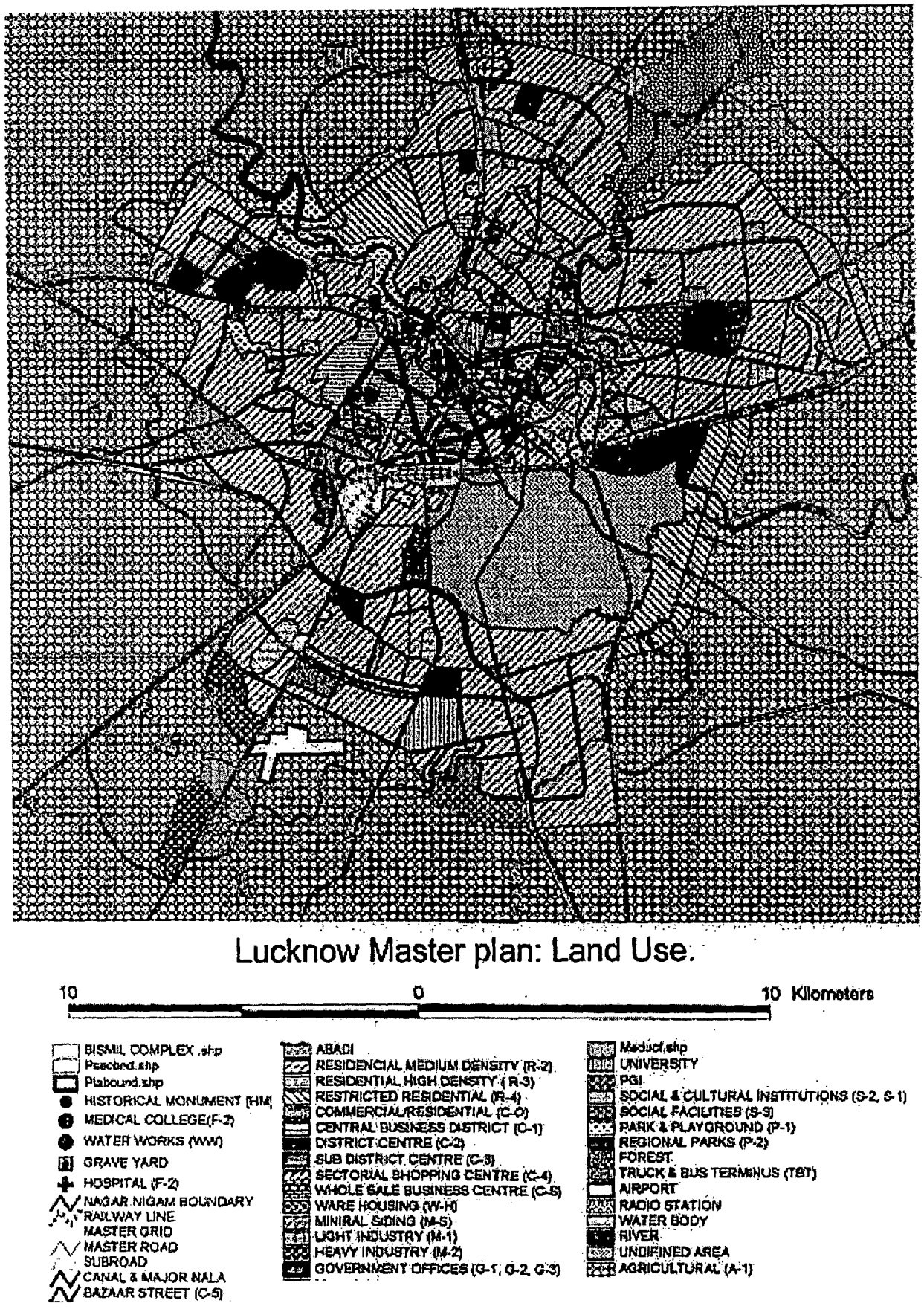


Figure 3.1 Land use plan

Land use pattern [5]:

Table 3.1 Changing land use distribution

Land use	Before 1965 Master Plan (%)	Proposed in Master Plan 1965-95 (%)	Existing in 1987 (%)	Proposed in Master Plan 2001 (%)
Residential	19.36	52.22	48.91	67.20
Commercial	01.27	03.80	02.43	04.10
Official	03.30	02.59	05.20	01.70
Industrial	02.16	08.71	06.50	03.10
Facilities	07.63	06.11	09.83	06.50
Recreational	02.62	09.97	03.78	07.90
Transportation	08.91	12.95	10.38	09.50
Open Spaces	20.14	00.65	12.97	-
Agriculture	34.61	-	-	-

3.1.4 Trends of growth:

The river Gomti formed the backdrop to the major activities during the Nawabi rule. The initial growth of the city started from the western side at the right bank of the Gomti river this area was called Chowk and then the city later started spreading in south and south-east directions. It was only in the early part of the nineteenth century that the city started to grow towards the east with major colonial inputs in terms of cantonment by the british in the post 1857 mutiny period and the Charbagh railway station in the south. During the post-independence and post partition period, a large migrant population settled in the southern part of the city along the Kanpur road. The sixties and seventies saw the easterly growth of the city and the eighties saw the development of the southeasterly part of the city [9].

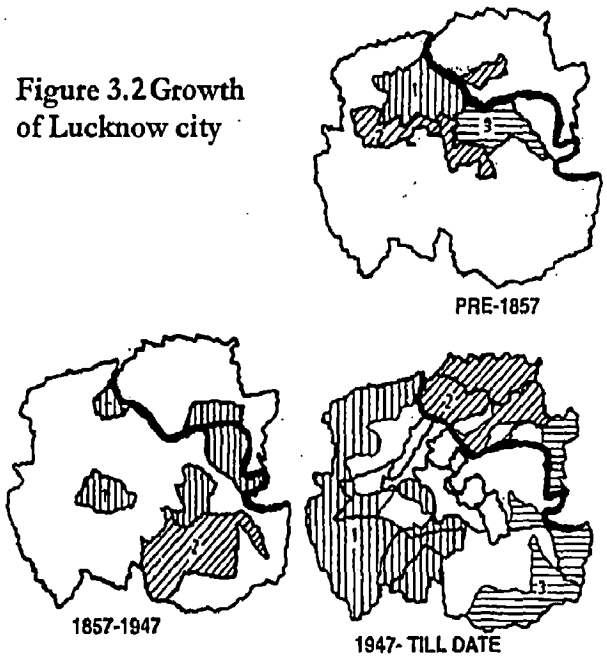


Figure 3.2 Growth of Lucknow city

3.1.5 Demographic pattern:

The population growth trend of Lucknow has been phenomenal, especially in the second last decade. In the decade 1981-91, a growth rate of 70.79% was registered, whereas in the preceding

two decades the growth rates have been 22.38% and 25.85% respectively. In the last decade the rate has been found to be 36.33% [5].

Table 3.2 Decadal population and area growth of the city.

Year	Area (sq.kms.)	Persons	% Decadal variation
1901 M.B.	44.03	256239	
1911 M.B.	44.03	252114	-1.61
1921 M.B.	44.03	240566	-4.58
1931 M.B.	44.03	251097	4.38
1941 M.B.	44.03	361294	43.89
1951 M.B.	44.03	459484	27.18
1961 M.C.	108.03	615523	33.96
1971 M.C.	100.26	774644	25.85
1981 M.C.	118.54	947990	22.38
1991 M.C.	310.10	1619115	70.79
2001 M.C.	310.10	2207340	36.33

* Source: Census; M.C.: Municipal Corporation; M.B. Municipal Board

1 Area and population:

The urban agglomeration has an area of 337.5 sq.kms. out of which the area under municipal corporation limits is 310.1 sq.kms. while the rest 27.4 sq.kms. comes under the cantonment. The population of the area under the city limits is 22,07,340 as per the 2001 census. The population of the district counts to be 2.22% of the state's population. The city shows an amorphous multi-nodal urban configuration [5].

Lucknow city stands fourth in the ranking of districts of Uttar Pradesh in terms of population density and stands seventh in terms of population size. The population densities show a great deal of variation in the city as itself. Among the 110 municipal wards, there are high-density wards with over 600 persons per hectare in the central core areas of the city and on the other hand the periphery wards show low to medium densities between 100 to 300 persons per hectare.

2 Sex ratio:

The male to female ratio is 860 females per 1000 males, which is quite close to that of the state.

3 Literacy:

The overall literacy rate is 60.4%, which is higher than that of the state, which on an average is 57.36% while the female literacy rate is 53% against the state average of 42.98% (as per census 2001) [5].

4. Employment scenario:

The employment scenario in various sectors is as shown in the following table.

Table 3.3 Workforce distribution [12]

S.No.	Employment sector	No. of persons
1	Manufacturing, processing, servicing and repairs in other than household industries	60,721
2	Construction	22,441
3	Trade and commerce	104,950
4	Transport, storage and communications	35,311
5	Other services	183,136
6	Marginal workers	3,012
7	Non-workers	1,268,185
	Total	**1,677,756**

3.1.6 Economic base:

As per Lucknow master plan 2001, Lucknow urban agglomeration has failed to attract appreciable quantity of industrial units. Consequently, work force in industrial sector continues to be negligible. The industrial inputs come mainly from Kanpur, which has many industrial settlements running since a long period. As state capital it continues to be the administrative center commanding and influencing a vast region. Lucknow is an important educational and commercial center of the state and fast assuming the function of an important trade and commercial center [5].

3.1.7 Socio- economic base:

The old city of Lucknow largely on the south of river Gomti is highly dense, having a very traditional background and a mixed economic profile whereas the new developments have taken place on the periphery of the old city in the post independence period where the people have relatively better economic condition.

1 Slums and low-income communities:

Almost 30% of the city's population lives in slums or low-income settlements. These households have inadequate housing and infrastructure facilities. The access to the urban services in these settlements is extremely limited [5].

2 Scheduled castes:

The scheduled caste population in the city is about 10%, which is relatively low as compared to the scheduled caste population of the state, which is about 21%.

3.1.8 Infrastructure facilities:

For a balanced and sustainable growth, an optimum balance between the needs of the growing population and the available infrastructure facilities. The infrastructure facilities can be grouped into two categories as follows.

1 Physical infrastructure:

1.1 Water supply:

Piped water supply network exists in most of the areas including the old city areas but the low-income groups still depend on water supply stand posts and hand pumps.

1.2 Electricity:

The city is well fed by the northern grid. The major electricity supply to the city is done through the Sarojaninagar substation besides the other three substations.

1.3 Sewerage and drainage:

The sewerage network extends to large part of eastern cis Gomti area however, 44,000 service latrines/ nalli discharge latrines exist in the city mainly in the low and middle-income settlements. Open defaction is common in certain parts of the city. Large part of the old city has either open pucca or covered drains. The drainage services are most deficient in areas inhabited by low-income population. In the newly developed peripheral areas, majority of households have piped water supply and drainage facility. The low-income settlements and slum pockets in the peripheral areas suffer from poor water supply and drainage facilities.

1.4 Solid waste disposal:

The city's solid wastes are collected by the municipal corporation and are dumped in the pre-designated dumping grounds. The corporation has a fleet of vehicles including JCV's, trucks and

tractors, which are used for the same. There are disposal bins, which have been places at various places in the city from which the authority collects the wastes and disposes it. At present there are two major dumping grounds.

Table 3.4 List of Dumping Sites of Lucknow Municipal Corporation

S.No.	Name of the Dumping Site
1	In front of Engineering College, Jankipuram
2	Near Idgagh, Aishbagh

* Source Lucknow Nagar Nigam, Lucknow.

The corporation has also started a project in collaboration with a Chennai based firm " M/s Asia Bio-Energy (India) Ltd" under which a power generation plant would be established on Hardoi road. This plant on becoming operational would process 300 tonns of bio- waste and would generate 5 megawatts of electricity per day. This is expected to become operational by March 2003.

2 Social infrastructure:

2.1 Health and education:

The city is full of educational institutions and hospitals, though the distribution is uneven. There are 715 educational institutions and around 75 health centers and hospitals [5].

3.1.9 Trade and commerce centers:

Old: Hazratganj, Aminabad, Chowk, Kaiserbagh, Nishatganj and Alambagh.

Recent: Kapoorthala, Bhootnath market.

New upcoming: Gomtinagar, Aashiana colony, Jankipuram and Vikasnagar.

3.1.10 Traffic and transportation:

Lucknow is well connected to all the major places in the country and the state by rail, air and road routes due to which, there is a continuous flow of tourists and passengers throughout the year. The city is bye passed by three national highways (NH-25, NH-28 and NH-56) and five provincial highways in addition to other local highways. The city has two major bus stations one at Charbagh and the other at Kaiserbagh. Lucknow is an important railway station of northern and northeastern railways. The domestic airport at Amausi caters to the air travel needs of the people.

The city has a good tempo, taxi and bus service, which has proved worth in terms of frequency and charge of service. The following table shows the distribution of various vehicles registered with the authorities.

Table 3.5 Distribution of vehicles in Lucknow city

S.No.	Vehicles	Numbers
1	Cars	60523
2	Jeeps	18867
3	Motor cycles	450630
4	Buses	3930
5	Trucks	12039
6	Maxi cabs	1233
7	Taxis	4230
8	Tempo taxi / auto rickshaw	8272
9	Tractors	11185
10	Trailors	911
11	Others	3074
	Total	**565873**

* Source: RTO Office, Transport nagar, Lucknow.

Recent introduction of electrified LRTS (Light Rail Transit System) has further strengthened the city's transportation system. At present it is running in a loop, which covers the city's peripheral areas, but there is a proposal to further extend the service to far off peripheral areas.

ROAD & RAIL NETWORK

3.2 Introduction: Study areas:

3.2.1 General:

In order to have an understanding of the existing conditions of the previously settled areas, few residential areas were selected for study and survey. This study was aimed at the underlying planning process and various factors that affect the success or failure of that particular area in terms of public response.

The residential settlements can be broadly classified into two categories – one promoted by the government authorities and the other by private bodies / agencies. These newly developed residential areas should have a reflection of the changing demands and needs and proper planning measures must be practiced. Although the government bodies seem to be more concerned with the byelaws and regulations, but still the ultimate outcome lags in some way or the other. In contrast to this, the private developers, especially the societies purchasing huge chunks of land and further retailing it in parts are generally less bothered by the planning controls. They are more oriented towards profit earning than provision of facilities and services. In fewer cases, well planned developments are found with the private firms, but the major fraction (% of total area) is kept under the plots.

For the purpose of study, four residential areas of Lucknow city were selected, out of which, two were promoted by the government and two by the private bodies / agencies. Among the two areas under each category, one has a relatively better status than the other which has been deprived of development and lacks planning concerns. The selected areas have been studied and analyzed comparatively to reveal their relative development status.

The areas selected are as follows:

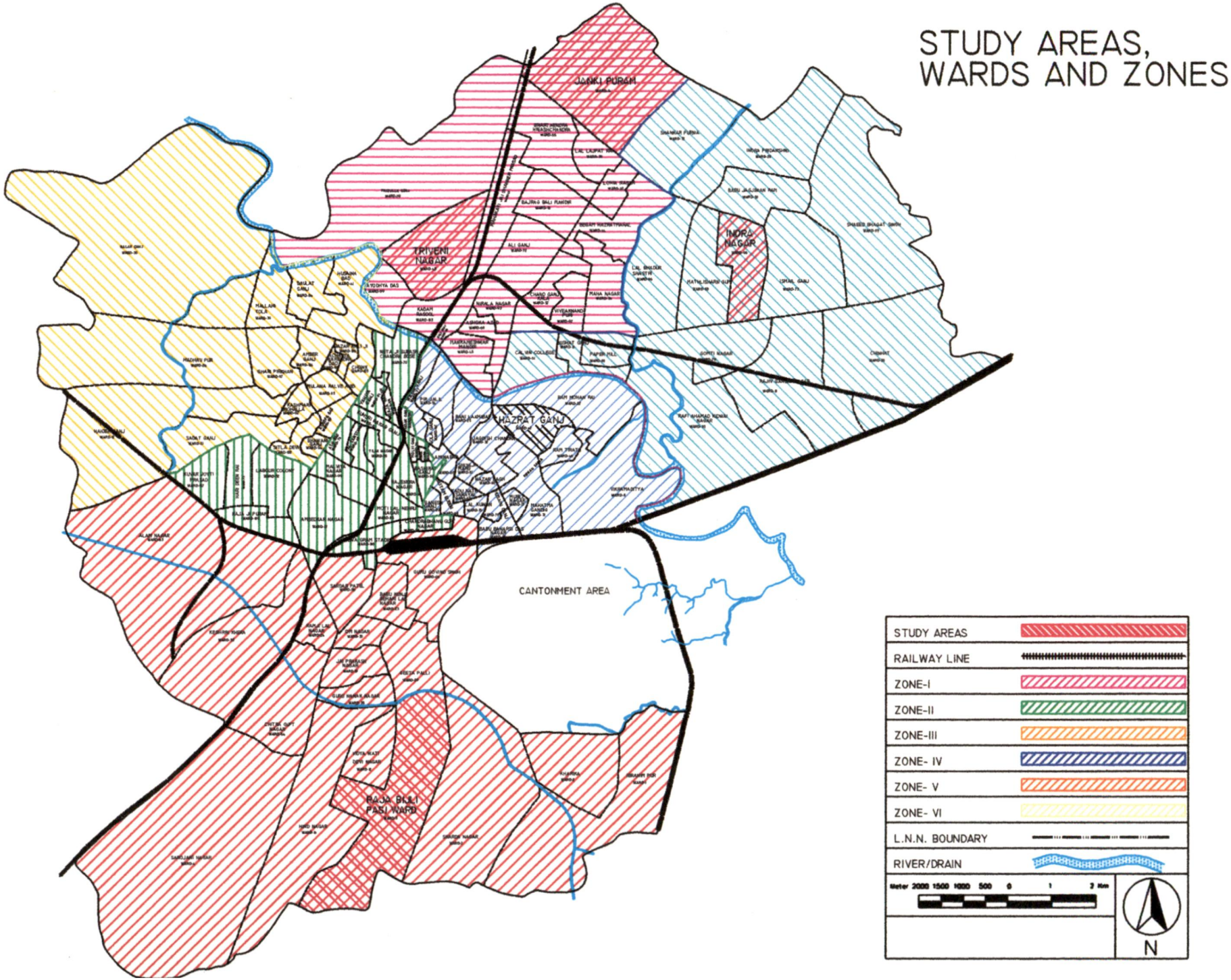
Promoted by the government authorities:

1. Indiranagar.
2. Jankipuram.

Promoted by private agencies / firms:

1. Ansal's Aashiana.
2. Triveninagar.

STUDY AREAS, WARDS AND ZONES



3.2.2 Study areas:

In order to have an understanding of the existing status of the residential areas of the city, a household survey was conducted in the study areas. Since the vast extent of the city poses a limitation as the attempt was timed, four residential areas of the city were selected to carry out survey work.

This selection was made on the basis of the following criteria:

1. Level of living conditions.
2. Nature of planning practice.
3. Relative rate of success or failure in terms of dweller's satisfaction.
4. Discussions with officials of various government departments and private bodies involved in mass residential developments.

The salient features and basic information about the areas selected have been discussed as under.

3.2.2.1. Indira Nagar:

Indira Nagar was established in 1970s by U.P. Housing Board. This was a response to the growing population of the city and consequential rise in the housing demand. People initially did not respond to the development the way the authorities had expected due to its location at the city's edge but its potential was later realized by the city dwellers and then there was an increased demand of plots and houses. It was this demand that encouraged the authorities to think of a new scheme called Gomti Nagar.

Indira Nagar was first of its kind for the city during that period with wide roads, open spaces, parks and other facilities and had a promising future. Its location along the Faizabad Road ensured rapid linkage with rest of the city.

The basic data and profile of the area can be summarized as follows:

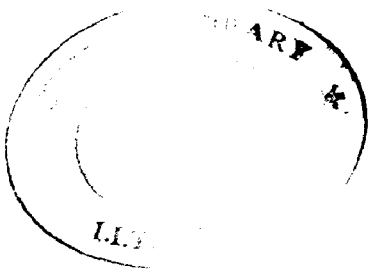
- Name of ward : Indira Nagar Ward.
- Location : Located in the North-Eastern side of the city,

abutting National Highway to Faizabad.

- Whether included in municipal limit : Yes.
- Year of establishment : 1970.
- Established by : U.P. Housing Board.
- Maintained by : Nagar Nigam, Lucknow.
- Area : 2.09 sq.km.
- Population : 21,602
- Population density (ward) : 103.35 ppha
- Distance from Hazratganj : 10 kms.
- Distance from Charbagh (Railway Station) : 14 kms.
- Average land cost (current) : Rs.225/sq.ft.
- Average plot size : 159.35 sq.m.
- Available modes of transportation : Tempo, Taxi, Bus.
- Slums in the area :

Name of the locality	**Population**
1. Tika Purva	560
	560

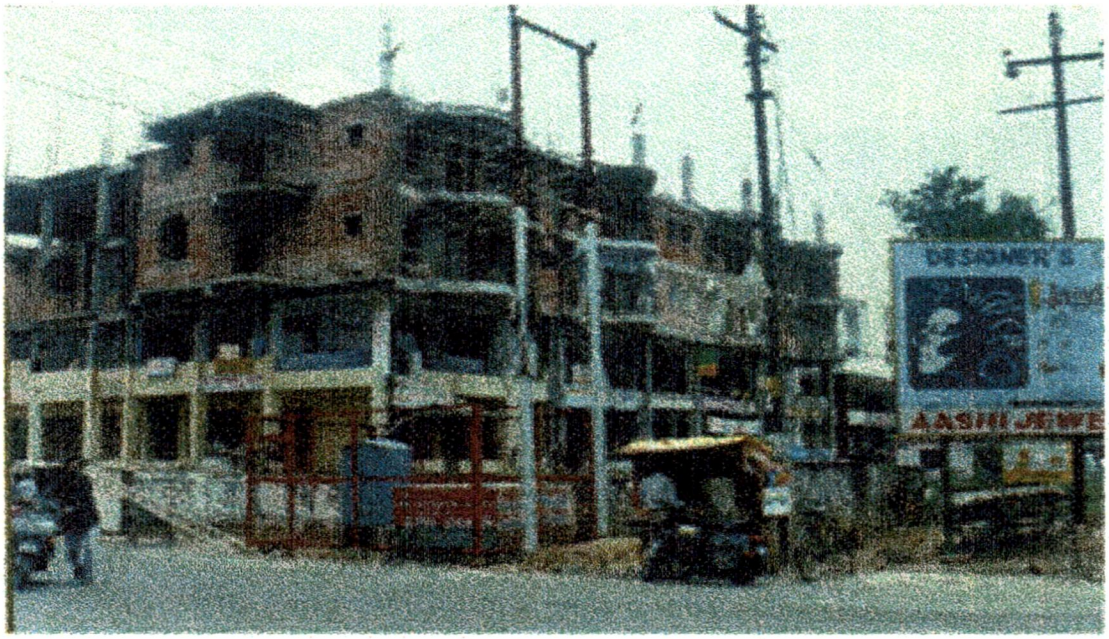
- Percentage of slum popln. : 2.59%
- Industrial units if any : Hindustan Aeronautics Limited.
- Present demand of houses and land in the area : High
- Any proposals in master plan 2001 : Further expansion of residential areas by development of new sectors and blocks, establishment of new commercial and recreational centers.



Commercial complexes

New construction techniques

New bus stands



New constructions

Pre-built houses

Convenient shopping

3.2.2.2 Jankipuram:

Jankipuram was settled by the Lucknow Development Authority in the year 1985. This locality was promoted observing the low land values in the area and presence of Engineering College, Lucknow University New Campus, and IIM Lucknow, which seemed to provide it a good ground to grow and develop. Housing colonies developed by SAHARA and SBI also contributed to generating a better growth environment. At present the demand of houses and plot has grown in this area but still the area lacks in terms of infrastructure and community facilities.

The presence of municipal dumping ground in sector E along the ring road (which passes through the area) poses environmental hazards like foul smell and unhygienic conditions. This site was earlier out of the town but as the city grew it is now within the municipal limit and has not been shifted as yet. The area also lacks proper drainage system and various community facilities.

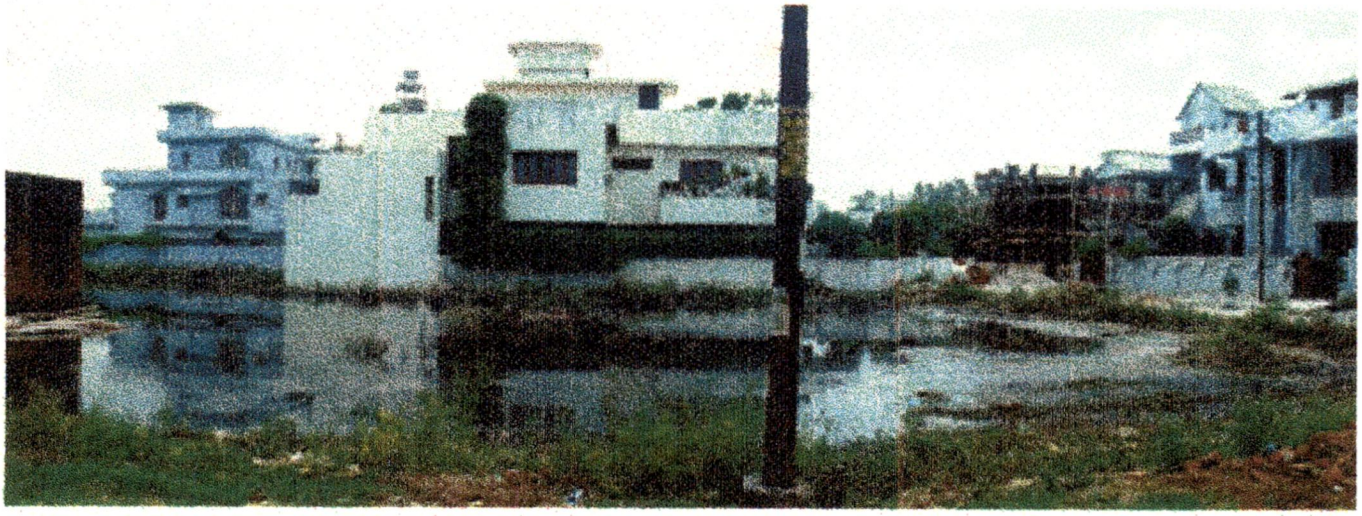
The basic data and profile of the area can be summarized as follows:

- Name of the ward : Jankipuram Ward.
- Location : Located in the Northern side of the city, abutting the municipal limit.
- Whether included in municipal limit : Yes
- Year of establishment : 1985
- Established by : Lucknow Development Authority.
- Maintained by : Nagar Nigam, Lucknow.
- Area : 6.53 sq.km.
- Population : 23,674
- Population density (ward) : 36.25 ppha
- Distance from Hazratganj : 9 kms.
- Distance from Charbagh (Railway Station) : 14 kms.
- Average land cost (current) : Rs.210/sq.ft.

- Average plot size : 131.40 sq.m.
- Available modes of transportation : Tempo, Taxi, Bus.
- Slums in the area :

Name of the locality	Population
1. Chuiya Purva	625
2. Sikandarpur	1,000
3. Rani Khera	375
4. Godian Purva	1,000
5. Sultanpur	175
6. Radheshyam Purva	350
7. Madiav	4,000
8. Khadara	500
9. Kir Purva	350
10. Khalilabad	200
11. Ram Purva	2,500
12. Chaudhari Purva	185
	11,260

- Percentage of slum popln. : 47.56%
- Industrial units if any : None
- Present demand of houses and land in the area : Moderate
- Any proposals in master plan 2001 : None



Water logging in vacant plots

Encroachment on vacant plots

Encroachment on vacant plots

Proposed bus stand

Poor drainage conditions

Water logging on roads

3.2.2.3 Aashiana colony:

Aashiana colony was settled by Ansal Group in the year 1985 observing the growing housing demand of the city. Aashiana was termed as the town's most modern, green, pollution free, self-contained mini-city. Spread over an area of 470 acres, the elite colony was planned with shopping complex, schools and a club, school for children, medical stores, postal facilities etc.

There were options of built up houses ready to be accommodated or vacant plots of various sizes to suit varying range of income groups. The various types of houses and plots available in the price range of 5 to 25 lakhs, with options of 1,2,3,4 rooms.

Houses Types:

Gulshan	(Plot area 331.30 sq. mtrs.)
Anjuman	(Plot area 229.90 sq. mtrs.)
Basera	(Plot area 179.40 sq. mtrs.)
Arzoo	(Plot area 140.10 sq. mtrs.)
Shagoofa	(Plot area 179.40 sq. mtrs.)
Mansooba	(Plot area 140.10 sq. mtrs.)

The basic data and profile of the area can be summarized as follows:

- Name of the ward : Raja Bijli Pasi Ward.
- Location : Located in the Southern side of the city, abutting the road leading to Kanpur.
- Whether included in municipal limit : Yes
- Year of establishment : 1985
- Established by : Ansal Group.
- Maintained by : Establishing agency (Ansals).
- Area : 1.90 sq.km.
- Population : 16,551
- Population density (ward) : 87 ppha
- Distance from Hazratganj : 7 kms.
- Distance from Charbagh : 5 kms.

(Railway Station)

- Average land cost (current) : Rs.200/sq.ft.
- Average plot size : 132.45 sq.m.
- Available modes of transportation : Tempo.
- Slums in the area :

Name of the locality	**Population**
1. Munshi Khera	2782
2. Behasa	750
3. Gudara	1125
	4,657

- Percentage of slum popln. : 28 %
- Industrial units if any : None
- Present demand of houses and land in the area : Low
- Any proposals in master plan 2001 : Yet to be handed over to the local bodies (municipal corporation) for maintenance

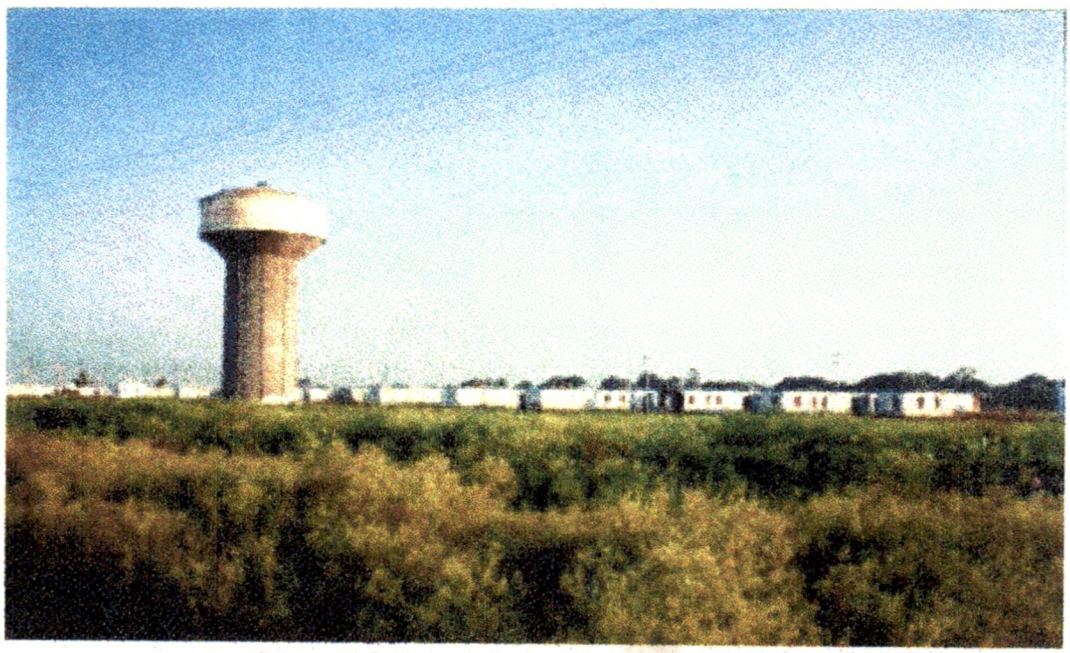
Proper setbacks

Scope of future expansion

Pre-built houses

Own drainage system

Parks / Open spaces



Low income settlements

3.2.2.4 Triveni Nagar:

Triveni Nagar was settled by private societies by purchasing land at very low costs and subdividing them into smaller plots and then selling them at higher rates. The area lags in terms of infrastructure and community facilities in addition to improper road widths, bad drainage and water supply system. The people living in this area generally belong to low-income group and lesser portion to middle and high-income groups. The rate of development has been rather slow in this area with respect to time. The area has irregular plot sizes and plot numbers, as there have been uneven and unplanned ownership patterns.

The basic data and profile of the area can be summarized as follows:

- Ward : Triveni Nagar Ward.
- Location : Located in the Northern side of the city, abutting National Highway to Sitapur/ Delhi.
- Whether included in municipal limit : Yes
- Year of establishment : 1985
- Established by : Private societies.
- Maintained by : Nagar Nigam, Lucknow.
- Area : 3.18 sq.km.
- Population : 19,892
- Population density (ward) : 62.55 ppha
- Distance from Hazratganj : 10 kms.
- Distance from Charbagh (Railway Station) : 14 kms.
- Average land cost (current) : Rs.160/sq.ft.
- Average plot size : 182.91 sq.m.
- Available modes of transportation : Tempo, Taxi, LRTS.
- Slums in the area :

Name of the locality	Population
1. Madayeganj – B	1,645
2. Madayeganj New	245
3. Patauraganj	905
4. Sripuram (Ektapuram)	940
5. Yogi Nagar	1,050
6. Shiv Lok	645
	5,430

- Percentage of slum popln. : 27.29%
- Industrial units if any : Small food processing and service industries.
- Present demand of houses and land in the area : Low
- Any proposals in master plan 2001 : None

Commercial centers

Encroachment on vacant plots

Unkept parks/ open spaces

Convenient shopping

Encroachment on setbacks

Water logging in vacant plots

3.3 Inferences from the layouts:

The following inferences have been drawn from the layout plans of the various study areas:

3.3.1 Indira Nagar:

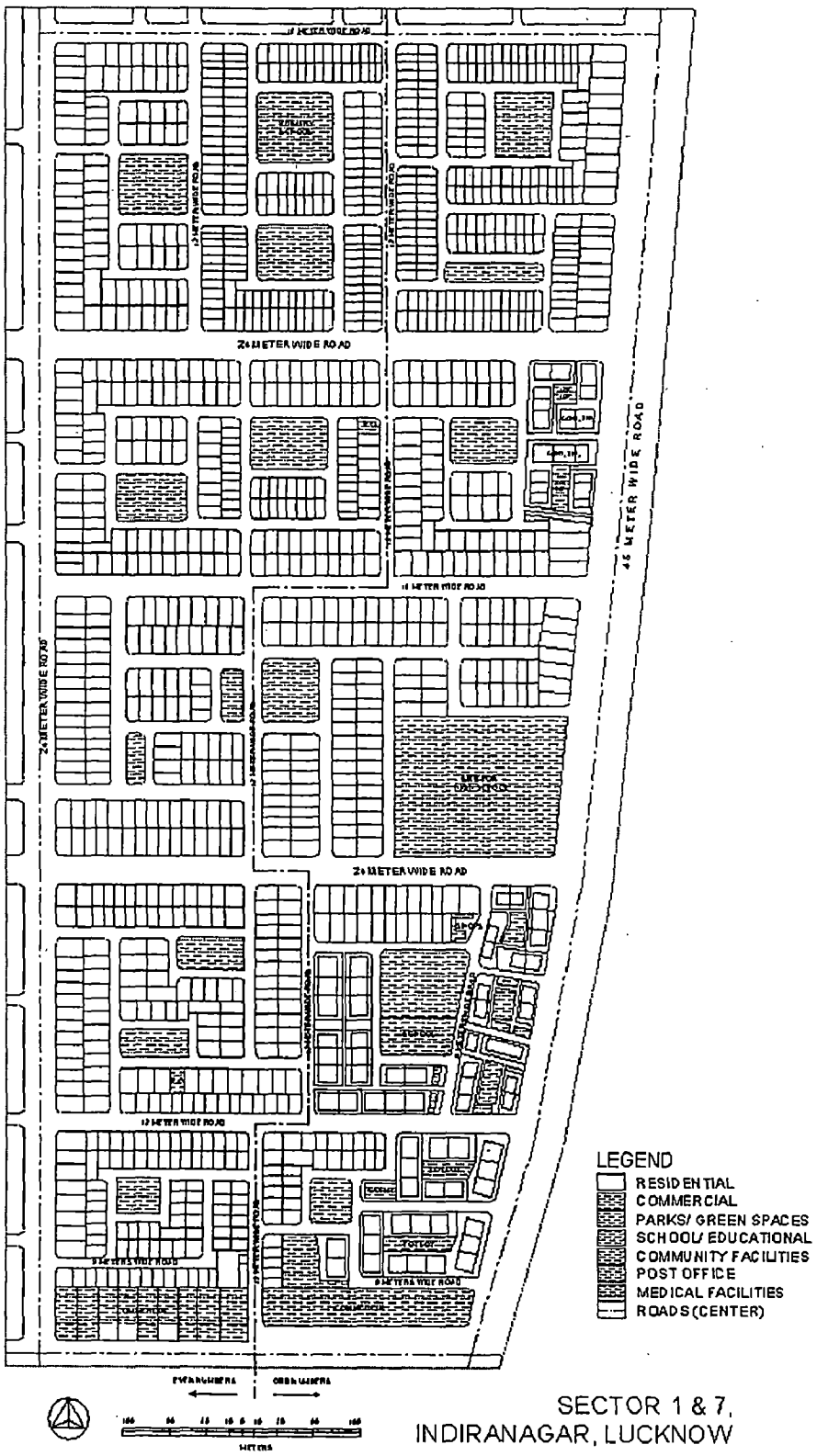


Figure 3.3 Layout; Indiranagar

The land use distribution as observed in the layout plan is as follows:

Table 3.6 Land use distribution, Indiranagar

S.No.	Land use	Percentage
1	Residential	52.60
2	Commercial	2.77
3	Green / open spaces	6.42
4	Educational	4.32
5	Facilities and services	0.53
6	Roads and circulation	33.36
	Total	**100**

Observations:

- Parks have been isolated from the main roads which have heavy traffic flow to ensure safety and isolation from the traffic noise.
- The plot numbers (odd and even) have been segregated in order to reduce the circulation while searching for a particular house number but for a new comer this poses confusion.
- The hierarchy of road widths is seen (varying in widths from 6 meters to 45 meters) which reflects the planning concern.
- The layout is systematic and the road network is functional.
- The L – junctions of the plot series has been worked out by elongating one plot but it itself is enclosed by other plots by three and half sides which may pose light and ventilation problems.
- The various sectors of the area along the Faizabad road have developed as commercial, work and service centers thereby creating job opportunities and give Indira Nagar a sustainable character.

3.3.2 Jankipuram:

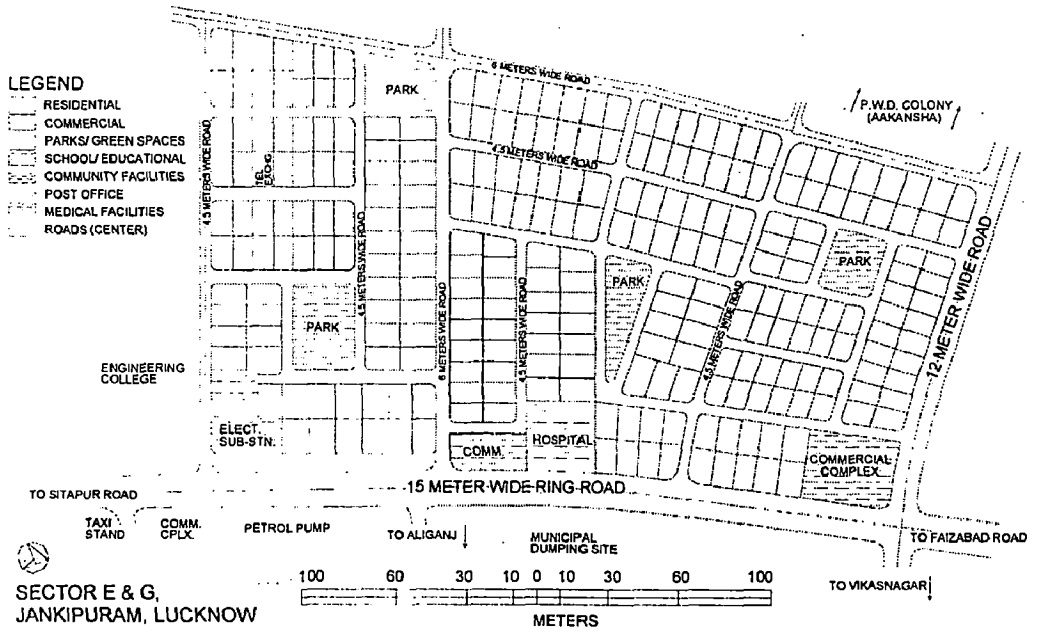


Figure 3.4 Layout; Jankipuram

The land use distribution as observed in the layout plan is as follows:

Table 3.7 Land use distribution, Jankipuram

S.No.	Land use	Percentage
1	Residential	63.77
2	Commercial	2.99
3	Green / open spaces	6.17
4	Educational	0.00
5	Facilities and services	3.37
6	Roads and circulation	23.70
	Total	**100**

Observations:

- The layout is non- systematic, as the green / open spaces are unevenly distributed. In addition, the commercial and medical facilities have concentrated along the main road itself.
- The location of the municipal dumping site in sector D poses environmental hazard as it generates foul smell and unhygienic conditions.
- The ring road carrying heavy vehicles has not been segregated well from the habitation areas, which leads to traffic noise and poses risk.

- In addition to the efforts by L.D.A., other organizations like S.B.I. and SAHARA group have also contributed to the housing provisions but the area has not come up as expected as it lags professional opportunities and is cut off from the city's work and service centers.
- The drainage system is improper and the area suffers from water logging problems. Various vacant plots are found to be filled with drainage and storm water, which created unhygienic conditions and promotes growth of flies and mosquitoes.
- The internal roads are full of patches and potholes which collect water and have improper slopes which restrict natural drainage and the drains along the road are seen dry.
- Garbage and solid waste disposal is improper as heaps of garbage can be seen lying along the roads.
- Some of the vacant plots have been occupied by slum dwellers and laborers and at places illegal commercial activities are also going on.
- Parks and open spaces are not well maintained. In one of the parks, there is not a single patch of greenery, while others lack maintenance.
- A bus stand was proposed in sector D adjacent to the dumping site but as yet it does not have any impression of a bus stand and is just a piece of land.
- The private parties have developed commercial complexes and hospital along the main road and the government's interventions in this regard are lacking.
- There is a lack of primary education centers in the area and people depend on the adjacent area (Aliganj) for the purpose.

3.3.3 Aashiana colony:

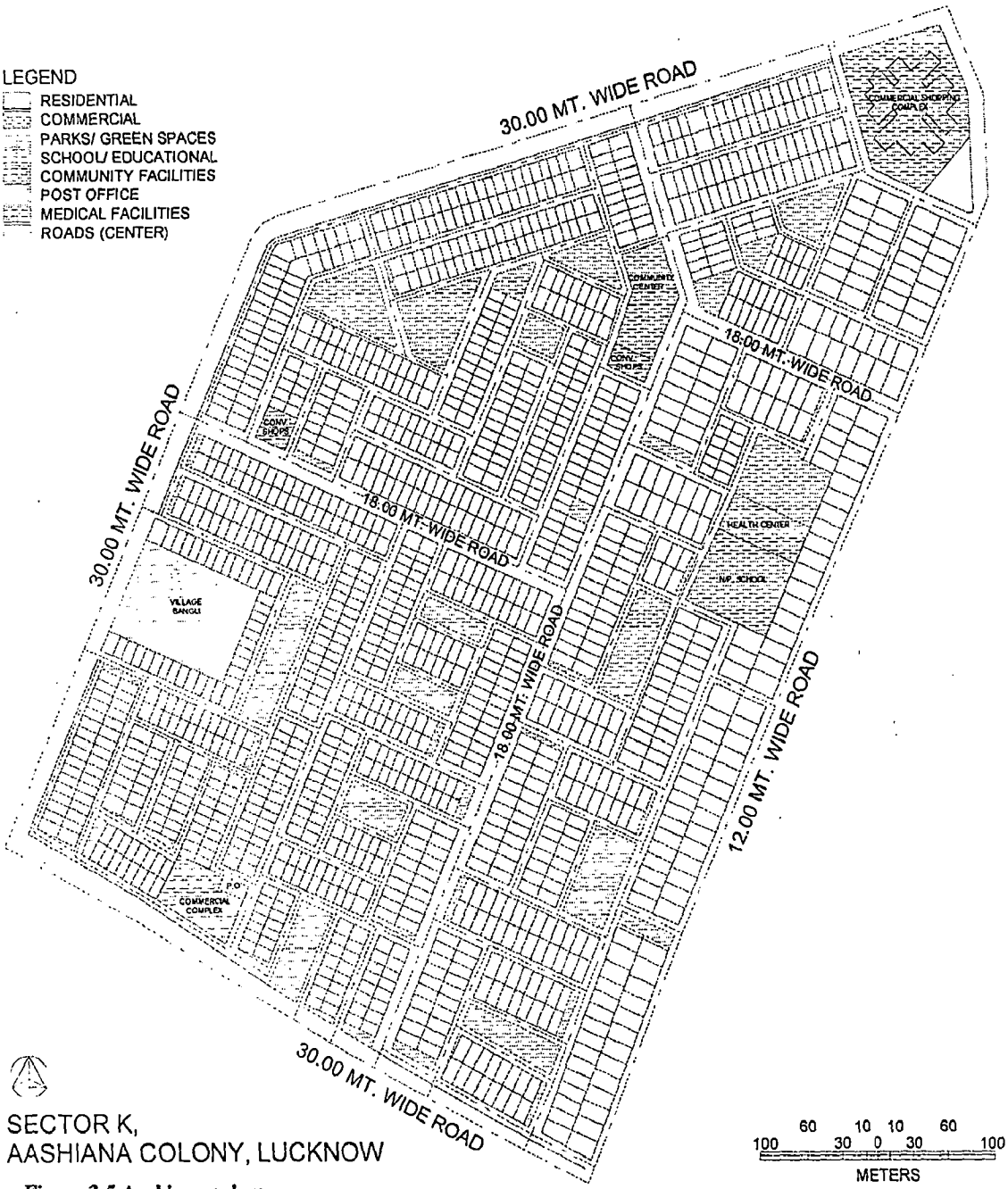


Figure 3.5 Aashiana colony

The land use distribution as observed in the layout plan is as follows:

Table 3.8 Land use distribution, Aashiana colony

S.No.	Land use	Percentage
1	Residential	70.26
2	Commercial	3.67
3	Green / open spaces	8.28
4	Educational	3.28
5	Facilities and services	5.24
6	Roads and circulation	9.27
	Total	**100.00**

Observations:

- There are various lanes which lack in terms of green / open spaces and the continuous series of plots pose a monotonous character.
- Various green spaces are outcome of the leftover negative spaces and are odd shaped.
- Hierarchy of roads is maintained and the plot sizes also vary to suit the people of different income groups.
- Options of pre-built houses and vacant plots are available.
- Commercial activities have been distributed through the layout to ensure proper coverage and the community facilities and services have been clubbed.
- The plot numbers have been put cluster wise but are non- systematic in nature.

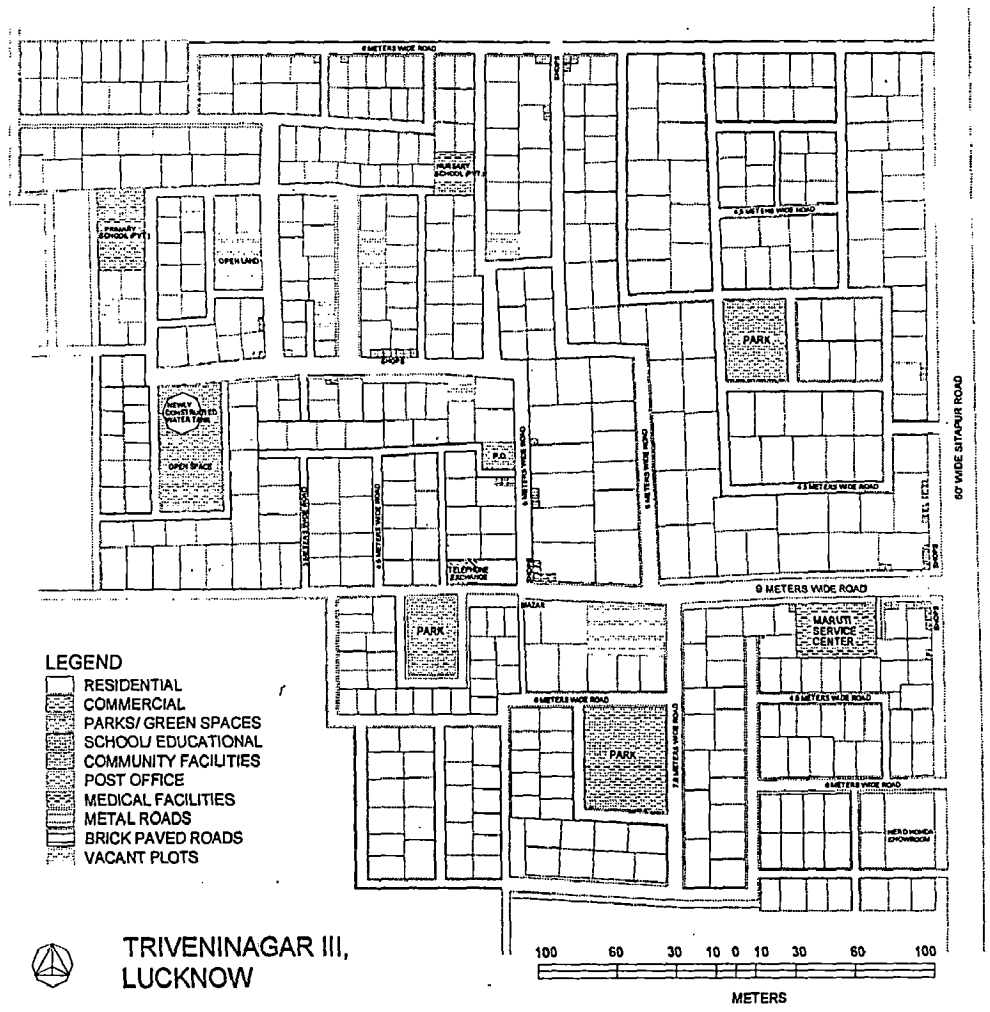
3.3.4 Triveninagar:

The land use distribution as observed in the layout plan is as follows:

Table 3.9 Land use distribution; Triveninagar

S.No.	Land use	Percentage
1	Residential	67.79
2	Commercial	1.57
3	Green / open spaces	3.65
4	Educational	0.82
5	Facilities and services	0.15
6	Roads and circulation	26.02
	Total	**100.00**

Figure 3.6 Layout; Triveninagar



Observations:

- The layout is non- systematic and confusing and the random plot numbers which have come up as a result of random ownership of properties with time, further aggravate the problem.
- Many plots are oriented longitudinally along the roads which means more length of roads and drainage network per plot thereby increasing the cost of infrastructure.
- In addition to the fact that the green and open spaces are un-proportionate, they are not maintained as there is no undertaking by the government authorities. At times local people manage to clean them up.

- There are plots which have been lying vacant for years suggesting that people have invested their money in the land to encash it with the rising land costs. This creates a virtual land scarcity and hikes the land values.
- New water overhead tank has been constructed by the authorities but still most of the households depend on their own sources of water like hand pumps and jet pumps. This is due to the fact that water lines suffer irregular distribution and pressure as many people have been using suction pumps along the mains.
- Improper road widths and irregular street patterns are evident.
- Setbacks have not been followed encroachment is prominent. Even the underground water and telephone lines run in the mid of the road as there is no space alongside.
- There is no sewerage system and people have own septic tanks. The drains along the roads vary from 6" to 1.5' in width which fail to serve the purpose and are often observed to be choked. During the rainy seasons the area suffers from serious water logging problems as it is low lying.
- The commercial activities have naturally come up with time in various dwelling units along the major streets and are unevenly distributed.
- Many households have built first and second floors for rental income.
- Private schools have come up in residences as the area did not have any provision previously.
- Many roads are non-metallic (brick paved) which are inconvenient during the rainy seasons.
- The layout has come up by itself and thus does not include any space for interaction and lacks in terms of community facilities and services.
- Incompatible land uses like automobile service center also find place in the layout.

Chapter 4.

ASSESSING THE SOCIO-ECONOMIC, PHYSICAL AND ENVIRONMENTAL CONDITIONS OF THE STUDY AREAS:

4.1 Introduction:

For the purpose of study, four residential areas of Lucknow city were selected, out of which, two were promoted by the government and two by the private bodies / agencies. Among the two areas under each category, one has a relatively better status than the other which has been deprived of development and lacks planning concerns. The selected areas have been studied and analyzed comparatively to reveal their relative development status.

In order to have an idea of the existing conditions of the selected study areas a household survey was done which covered various socio-economic, physical and environmental factors. The primary data thus collected was analyzed on comparative basis to reveal important inferences which may be useful in formulation of the policy guidelines and strategies for new residential developments.

4.2 INFERENCES FROM THE SURVEY DATA TABLES (based on income groups):

The following inferences have been drawn from the combined survey data of the various study areas:

Table 4.1 Occupational Structure Vs Income group:

	Service	Business	Total
<5000			**0**
5000-10000	9	4	**13**
10000-15000	22	20	**42**
>15000	16	9	**25**
Total	**47**	**33**	**80**

- Majority of the households (52.5%) on an average, have been found to belong to the middle income group (Rs. 10,000-15,000 p.m.), but Triveninagar has shown higher percentage of households in the income range of >15,000.

- There is no household in the income range of <5,000.
- Service class has been found to be higher in strength (58.75%), with an exception of Jankipuram where this proportion is 50-50.

Table 4.2 Earning members Vs Income group:

	1	2	3	Total
<5000				**0**
5000-10000	10	2	1	**13**
10000-15000	27	14	1	**42**
>15000	10	12	3	**25**
Total	**47**	**28**	**5**	**80**

- More than half (58%) of the households have a single earning member in the family.
- Triveninagar has shown higher percentage (50%) of households having two earning members.

Table 4.3 Number of family members Vs Income group:

	1	2	3	4	5	6	7	8	Total
<5000									**0**
5000-10000		1		3	4	1	1	3	**13**
10000-15000			7	9	14	8	3	1	**42**
>15000			2	3	4	10	5	1	**25**
Total	**0**	**1**	**9**	**15**	**22**	**19**	**9**	**5**	**80**

- The number of family members has been observed to increase with the income range but again falls down with further rise in the income. Some areas have shown a continuous increase in number of family members with income range.
- The average number of family members per household has been found to be 5.

Table 4.4 Type of housing Vs Income group:

	Owned	Rented	Govt. Leased	Pvt. Leased	Total
<5000					**0**
5000-10000	6	7			**13**
10000-15000	30	10	2		**42**
>15000	22	3			**25**
Total	**58**	**20**	**2**	**0**	**80**

- About three fourth (72.5%) of the households are self owned. This ownership has been found to be maximum in Jankipuram and minimum in Aashiana colony.

- Majority (50%) of the people living in the rented accommodations belong to 10,000 - 15,000 class. Except for Triveninagar where this fraction is dominated by the 5,000 – 10,000 class.
- Minor fraction of the households (2.5%) is government leased.

Table 4.5 Period of living Vs Income group:

	<5 yrs	5-10 yrs	10-15 yrs	>15 yrs	Total
<5000					**0**
5000-10000	7	3	2	1	**13**
10000-15000	16	18	6	2	**42**
>15000	6	15	3	1	**25**
Total	**29**	**36**	**11**	**4**	**80**

- About half the people (45%) have been living since 5 – 10 years in general, except for Jankipuram where majority of people have been living since <5 years.
- The major influx of people has been within the past 10 years. Triveninagar has shown a regular influx of people with time (since past 15 years).
- In general higher income groups first accommodated the areas.

Table 4.6 Availability of rented accommodation Vs Income group:

	Yes	No	Total
<5000			**0**
5000-10000	1	12	**13**
10000-15000	12	30	**42**
>15000	11	14	**25**
Total	**24**	**56**	**80**

- More than one fourth of the households have been found to have rented accommodation available. Triveninagar and Jankipuram have shown higher rates of this availability.
- The availability of rented accommodation in general, first increases and then decreases with increase in the income range. Triveninagar and Jankipuram have shown a continuous increase of this availability with income ranges.
- The major providers of the rented accommodation are the middle income groups (10,000-15,000 range). In Triveninagar and Jankipuram the higher income groups are the major providers.

Table 4.7 Reason for opting house in a particular locality Vs Income group:

	Nearness to workplace	Nearness to relatives	Access to facilities	Affordable cost	Ancestral property	Total
<5000						0
5000-10000	6			11		17
10000-15000	6	4	3	32	5	50
>15000	5	5	5	21	1	37
Total	17	9	8	64	6	104

- The major factor while choosing a residential location is the land cost.
- Lower income groups have shown interest in nearness to workplace.
- Higher income groups have shown interest in the availability of services and facilities.

Table 4.8 Housing finance/ loan availed Vs Income group:

	Yes	No	Total
<5000			0
5000-10000	1	12	13
10000-15000	13	29	42
>15000	15	10	25
Total	29	51	80

- More than one fourth (36.25%) households have availed housing finance/ loans.
- Indiranagar and Jankipuram have shown higher fraction of households availing loans.
- Higher income groups have been found to be availing loans more often (51%). In Indiranagar and Aashiana colony the middle income groups have been found to be availing these facilities more often.

Table 4.9 Housing finance/ loan availed Vs Occupational structure:

	Yes	No	Total
Service	16	32	48
Business	13	19	32
Total	29	51	80

- On an average higher fraction (40.6%) of the business class has availed financial help/ loans, except for Triveninagar where the service class has shown greater involvement.

Table 4.10 Ownership of vehicles Vs Income group:

	4 wheeler	2 wheeler	Bicycle	Others	Total
<5000					0
5000-10000	2	10	8		20
10000-15000	13	42	33		88
>15000	21	25	17		63
Total	36	77	58	0	171

- Almost all (96.25%) of the households have been found to have a two wheeler.
- Ownership of a four wheeler increases with increase in income.
- Ownership of a bicycle first increases with increase in income and then decreases with further increase in income.

Table 4.11 Application of renewable energy Vs Income group:

	Yes	No	Total
<5000			0
5000-10000	2	11	13
10000-15000	9	33	42
>15000	8	17	25
Total	19	61	80

- The application of renewable sources of energy is generally found to be confined to the higher income classes.
- About one fourth (23.75%) of the households have adopted these sources.
- This application is found to first increase with rise in income and then decreases.

Table 4.12 Destination Vs Mode Vs Income group:

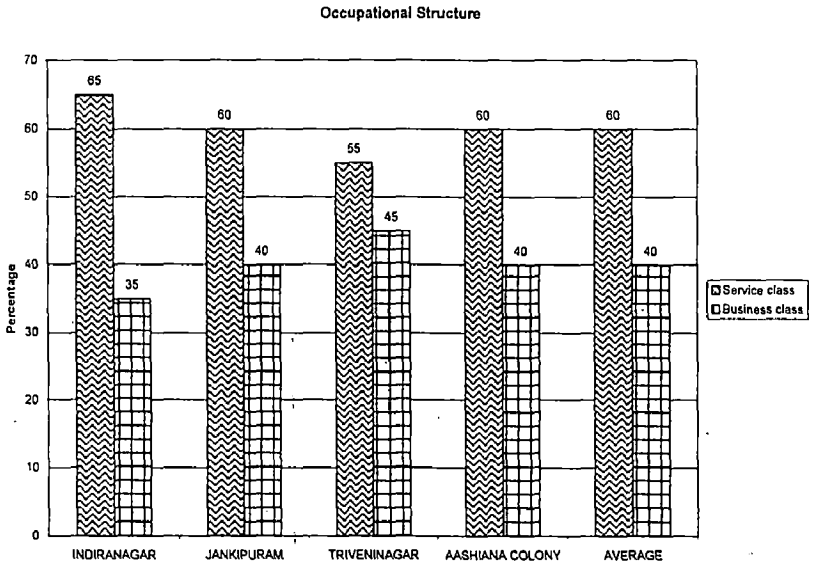
Destination	Mode	<5000	5000-10000	10000-15000	>15000	Total
Workplace	*Public Transport*		3	12	2	17
	Own Mode		10	30	23	63
Market	*Public Transport*		4	9	3	16
	Own Mode		9	33	22	64
Recreation	*Public Transport*		7	21	1	29
	Own Mode		6	21	24	51
Education	*Public Transport*		9	26	14	49
	Own Mode		4	16	11	31
Medical facility	*Public Transport*		5	7	3	15
	Own Mode		8	35	22	65
	Total	0	65	210	125	400

- Majority of households (61.25%) have been found to be relying on the public transportation services for availing educational facilities.
- For accessing other services and facilities like, place of work, market, recreation and health, majority of people rely on their own mode of transportation.
- The lower and the higher income groups less often use the public transportation facilities, thus the major users of the system are the households of middle income range.

4.3 INFERENCES FROM THE SURVEY DATA CHARTS:

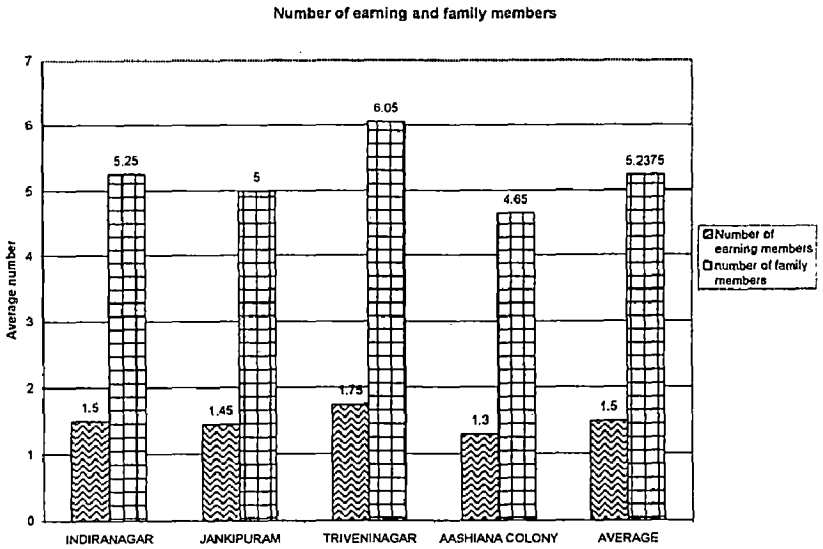
4.3.1 The following inferences have been drawn from the comparative analysis under various heads of the four selected residential areas:

Figure 4.1:



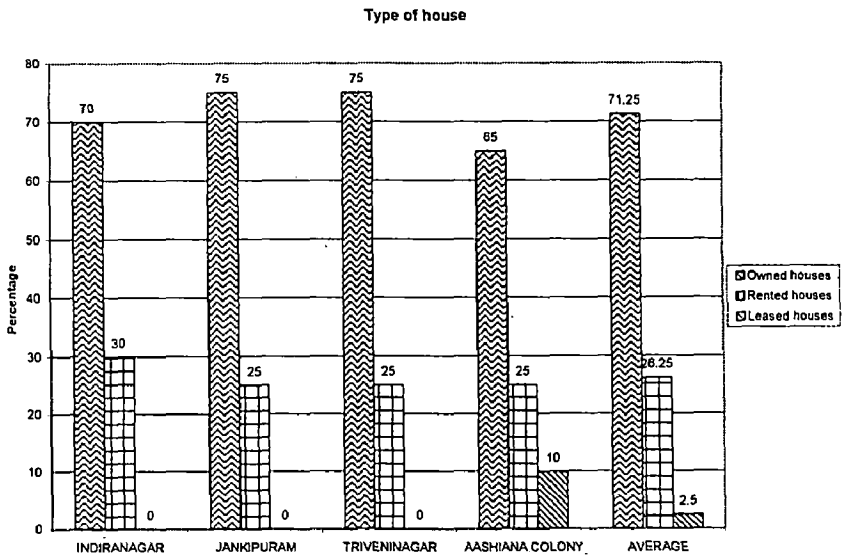
- There is a larger strength of the service class (60%) as against business class (40%) in the study areas in general. Indiranagar has the highest fraction of service class (65%).

Figure 4.2:



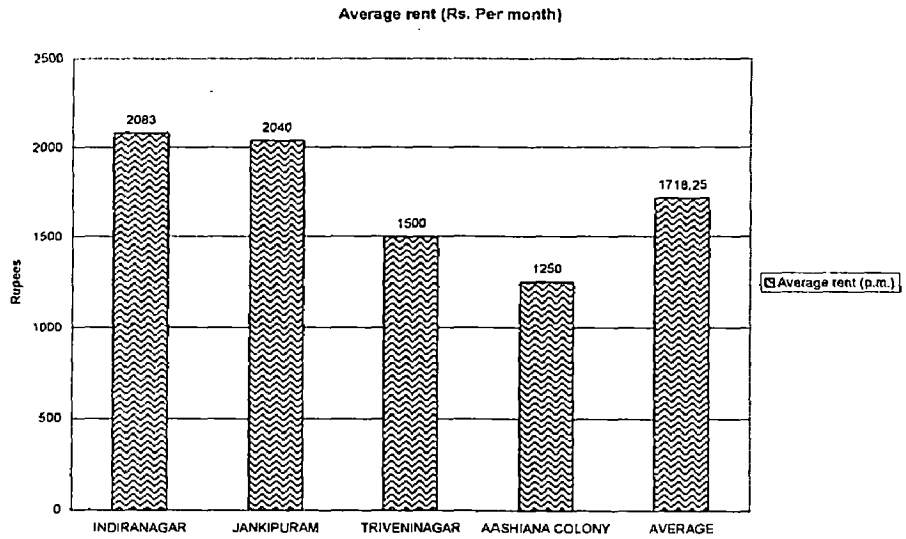
- The average family size has been found to be 5.23 and average number of earning members per family to be 1.5.
- Triveninagar has shown high family sizes and higher number of earning members per family.

Figure 4.3:



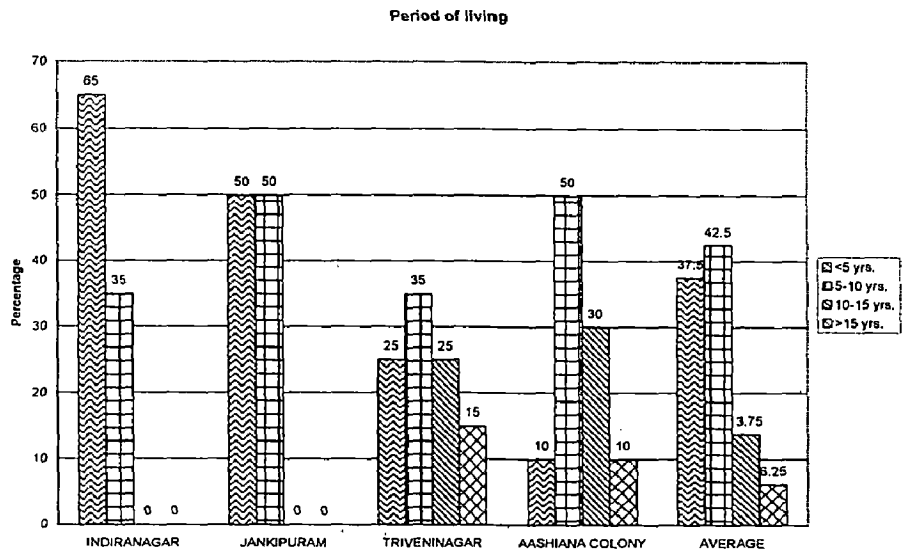
- Majority of people (71.25%) are having their own houses.
- Indiranagar has shown maximum availability of rental accommodation (30% households) suggesting that people have purchased properties and rented them so as to form another source of income.

Figure 4.4:



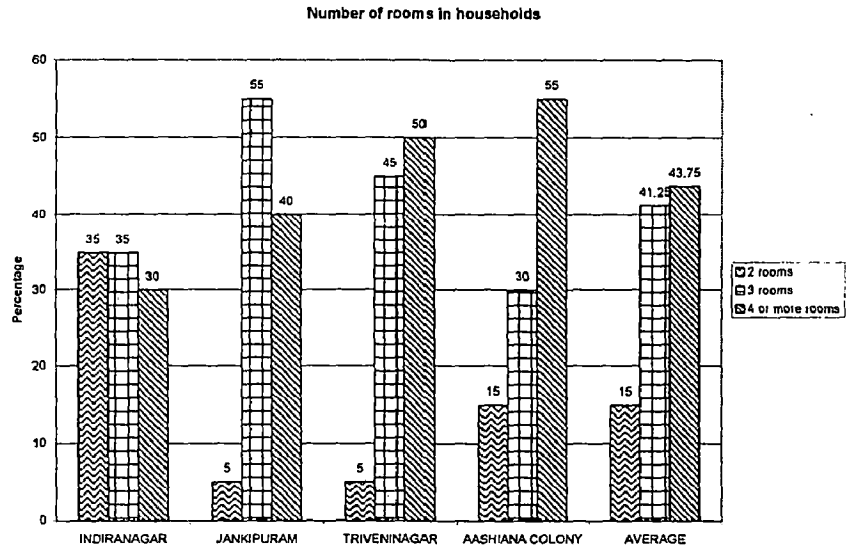
- The average rent has come out to be Rs. 1718.25 per month for a unit.
- Indiranagar has maximum and Ashiana colony has minimum rental values of the units.

Figure 4.5:



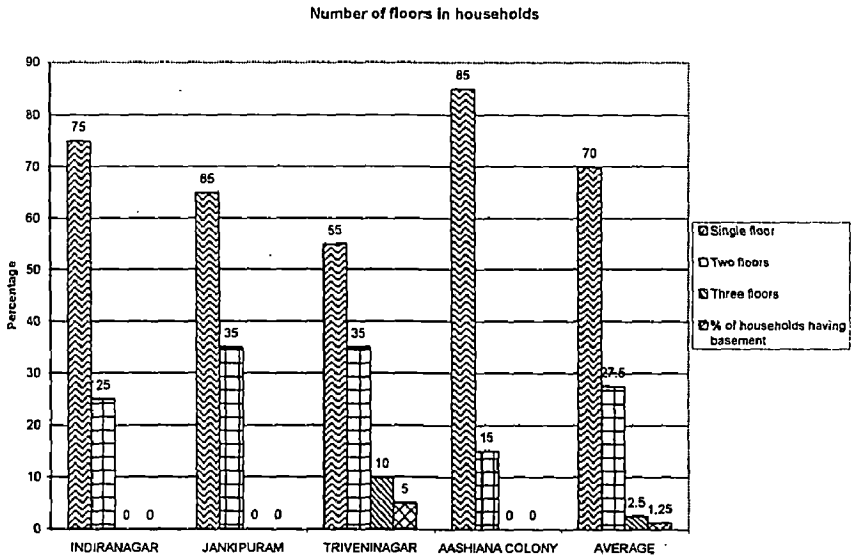
- There has been major influx of people during the past 10 years, as majority of people (42.5%) have been living since past 5-10 years.
- Triveninagar has shown a stable and regular influx of people with time.

Figure 4.6:



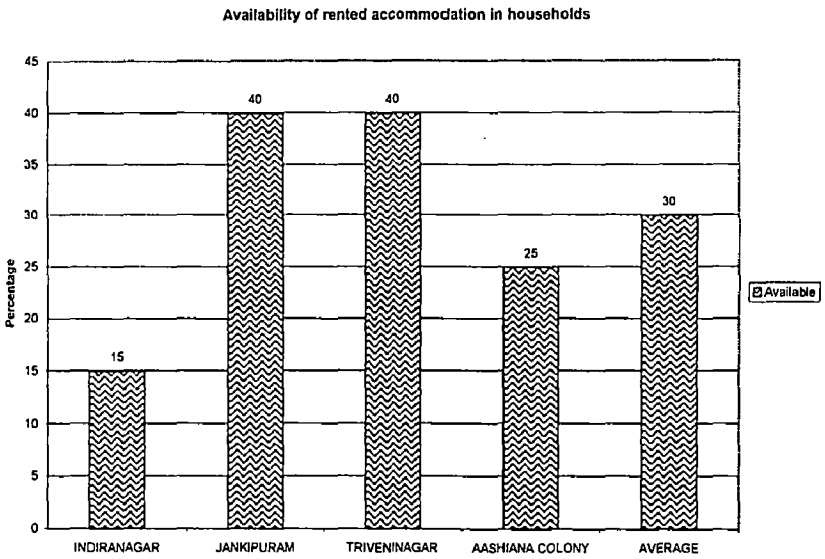
- Major households (43.75%) have 4 or more rooms.
- Jankipuram has shown lesser rooms per unit suggesting smaller plot sizes.

Figure 4.7:



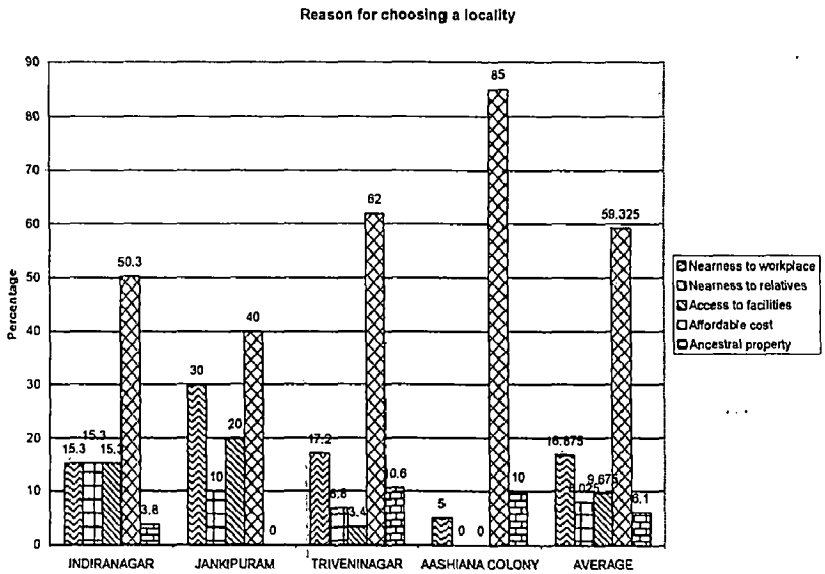
- Major houses (70%) are single storied and very rarely (1.25%) they have a basement floor.
- Aashiana seems to be predominantly low rise settlement with highest fraction of single storied houses.

Figure 4.8:



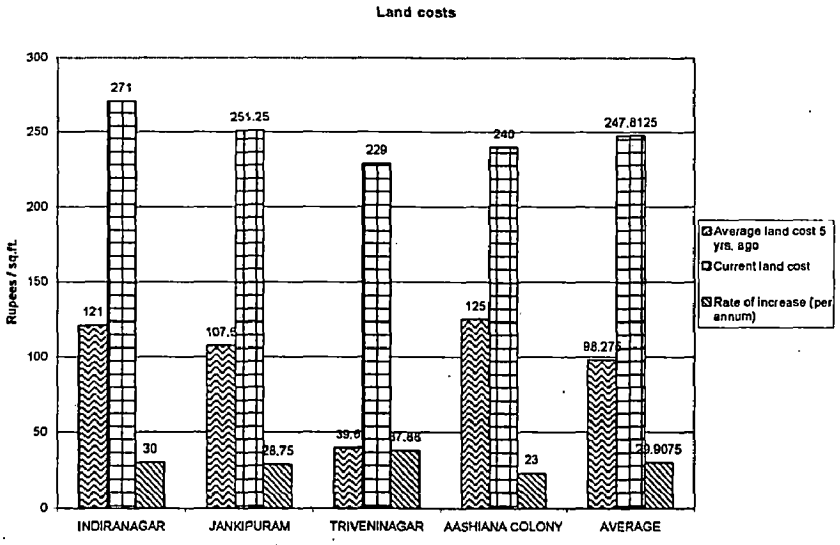
- On an average one third (30%) of the households have rented accommodations available.
- In Jankipuram and Indiranagar more households (40%) have this availability.

Figure 4.9:



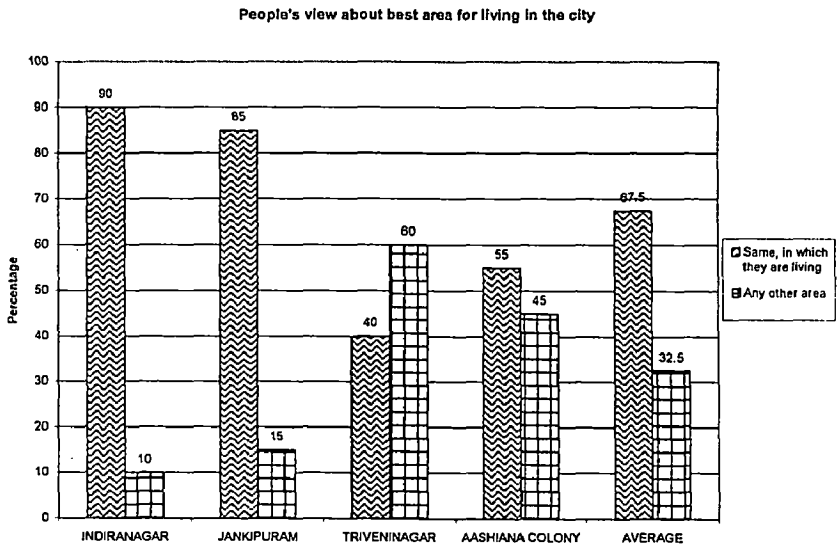
- The most prominent factor for selection of residential location remains the low land costs (59.32% cases).
- Jankipuram and Indiranagar had more number of respondents attracted by facilities and services.
- Jankipuram has displayed nearness to workplace as an attraction.

Figure 4.10:



- The average rate of increase of land costs has been rupees 29.9 per sq. ft. per year.
- Triveninagar has shown maximum rate of increase of land values in past 5 years, while Aashiana colony has shown minimum rate.
- At present, Indiranagar has the most expansive lands.

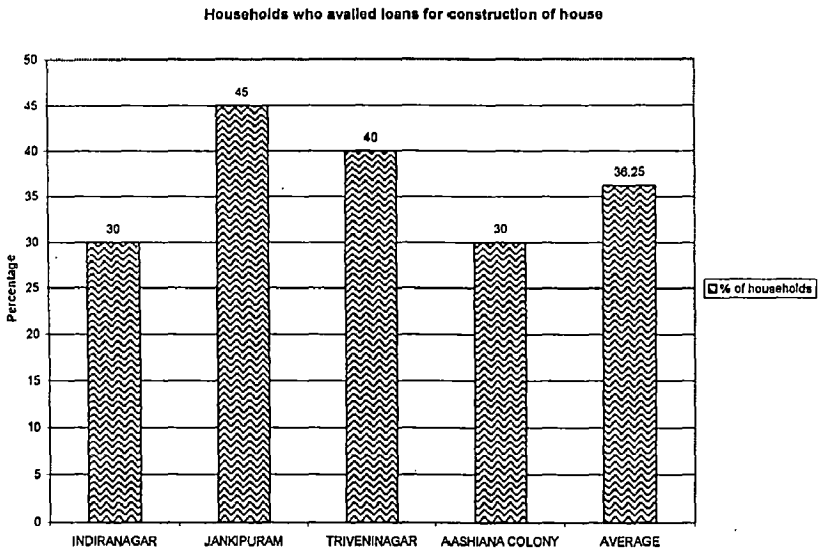
Figure 4.11:



- On an average, majority (67.5%) of households have been found to be grading their current place of living to be the best in the city.

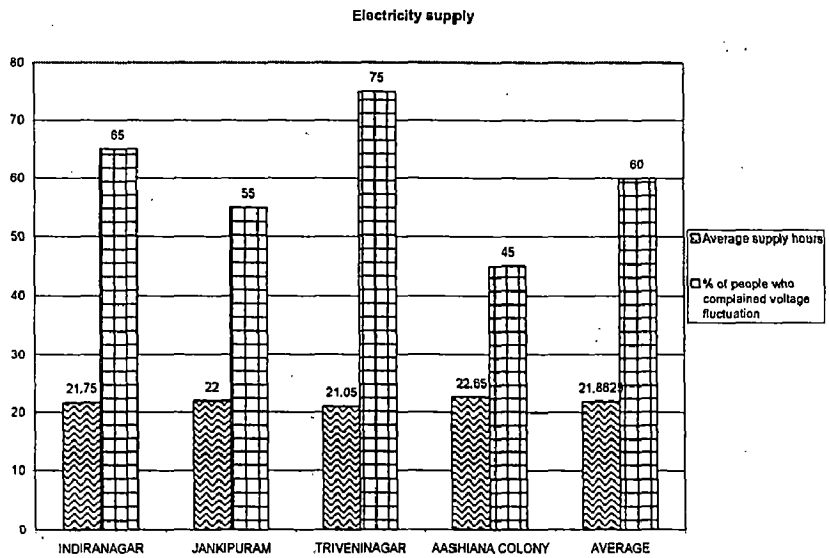
- Indiranagar and Jankipuram have shown higher degree of satisfaction of the dwellers, while Aashiana colony and especially Triveninagar have shown high degree of dissatisfaction.

Figure 4.12:



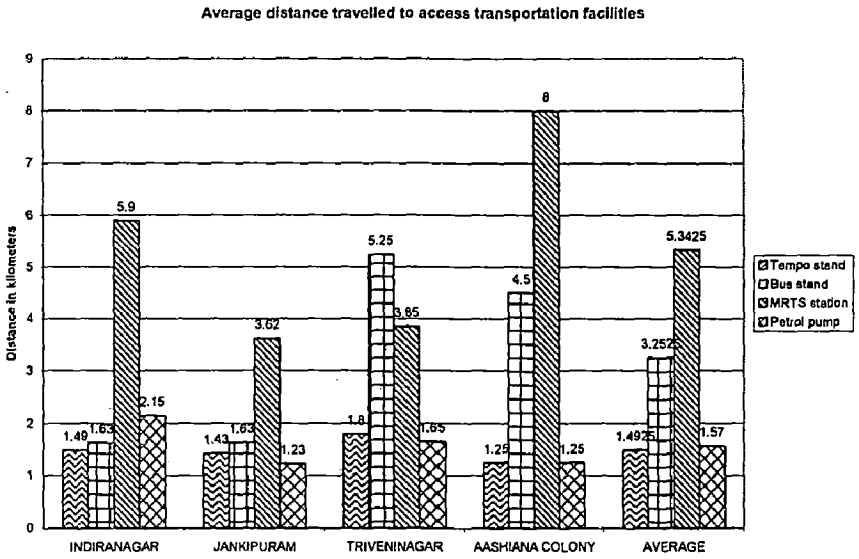
- On an average more than one third (36.25%) of the households have availed loans or financial help for housing purposes.
- Jankipuram has maximum number of such households and Indiranagar and Aashiana colony have lower rates.

Figure 4.13:



- The average electricity supply hours have been found to be 21.86 hours per day.
- Triveninagar has shown high rate of voltage fluctuation, while Aashiana colony can be considered best in this regard.

Figure 4.14:

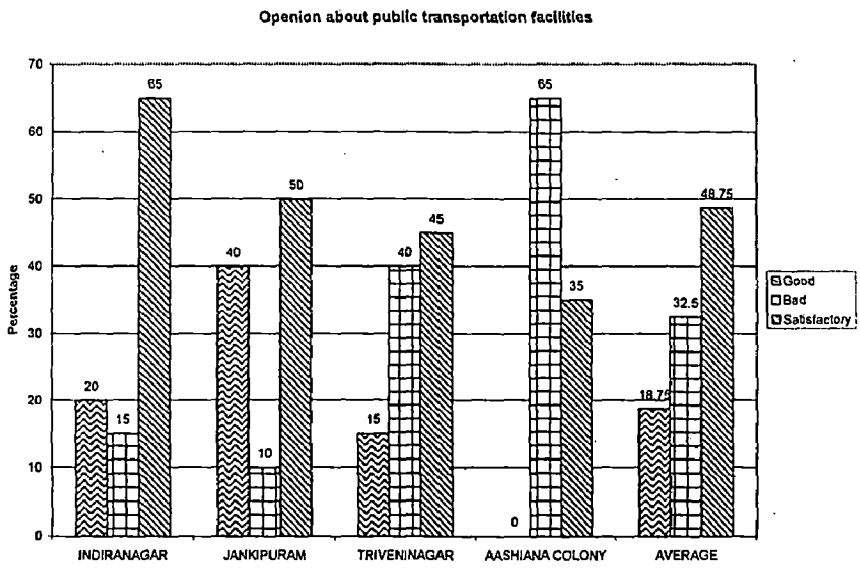


- The average distance traveled to access the following services are:

Tempo	:	1.49 kms.	Bus	:	3.25 kms.
L.R.T.S.	:	5.34 kms.	Petrol pump	:	1.57 kms.

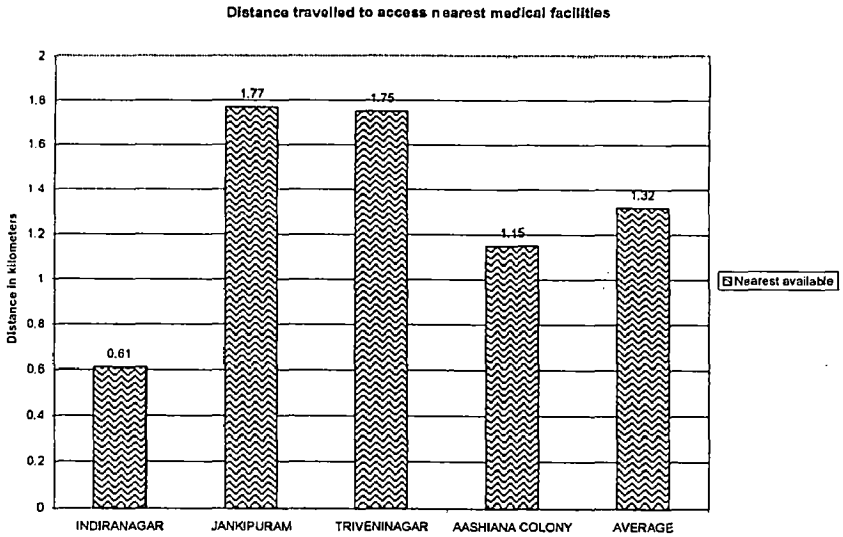
- Triveninagar lacks bus services, while Aashiana colony and Indiranagar involve larger distances to be traveled to avail L.R.T.S. service.

Figure 4.15:



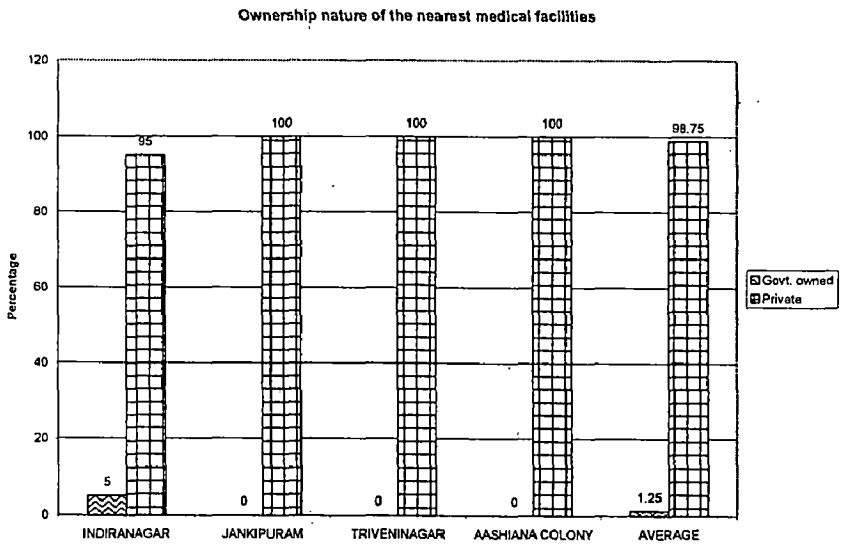
- On an average only 18.75% respondents have graded public transportation facilities as good, 32.5% as bad and 48.75% as satisfactory.
- Indiranagar has maximum and Aashiana colony has minimum level of satisfaction in this regard.

Figure 4.16:



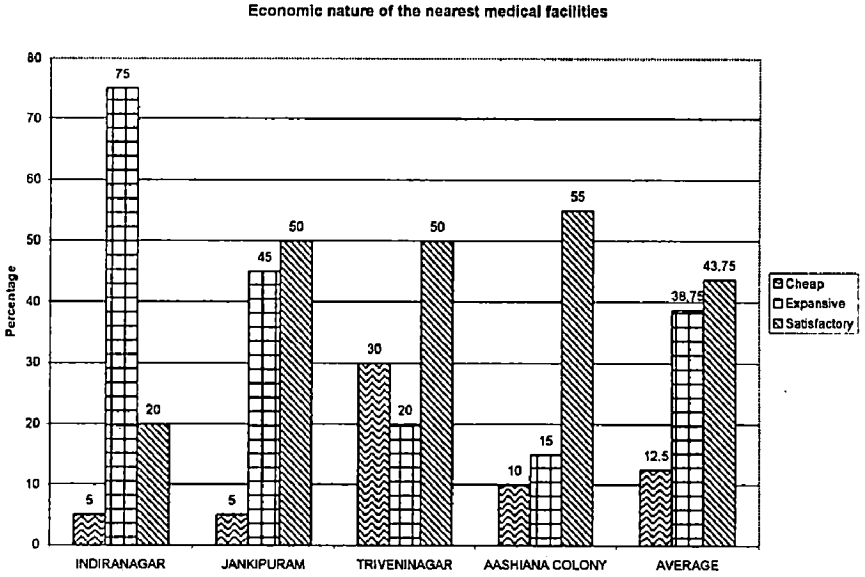
- Medical facilities at an average are available at a distance of 1.32 kms.
- Indiranagar is best but Jankipuram is worst in this regard.

Figure 4.17:



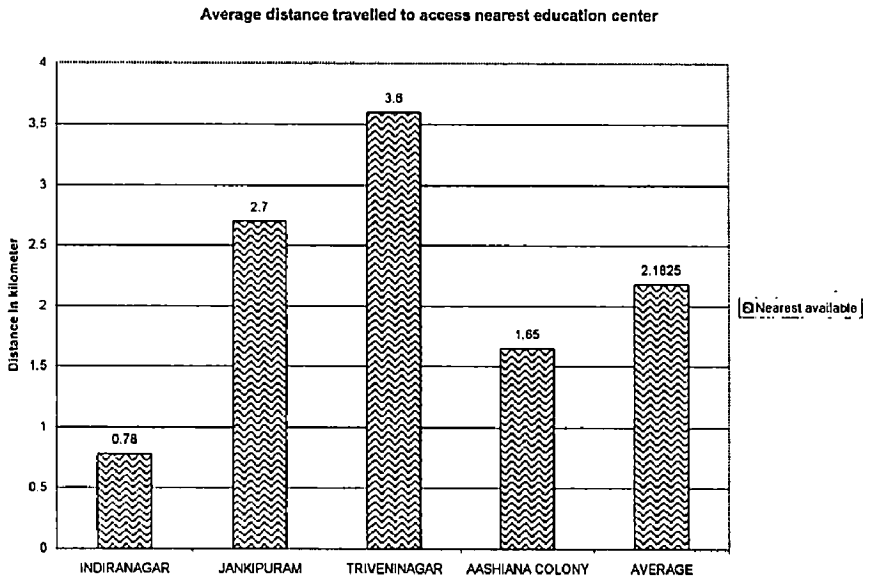
- On an average almost all (98.75%) the medical services are being provided by the private organizations and only 1.25% by the government.

Figure 4.18:



- More than one third (38.75%) of the respondents have reported the medical services to be expansive.
- Indiranagar has the most expansive medical services, while cheapest services are available in Triveninagar.

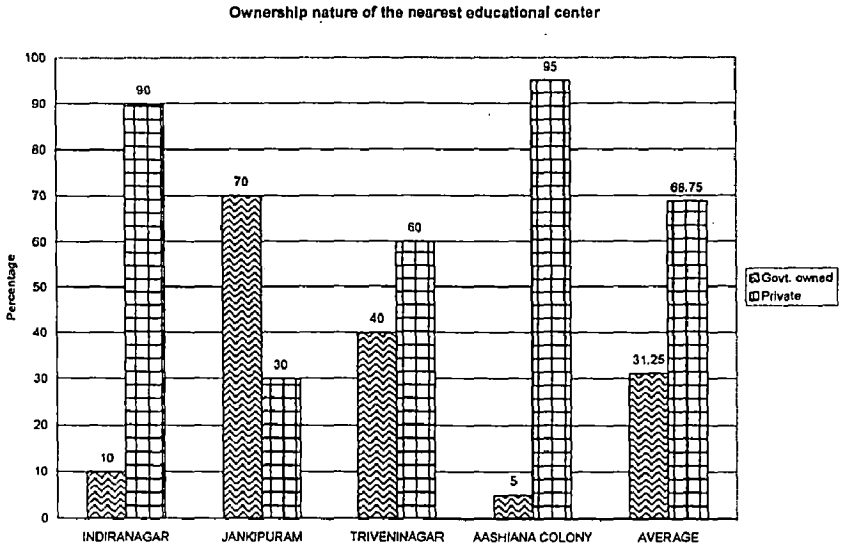
Figure 4.19:



- Educational facilities are available at an average distance of 2.18 kms.

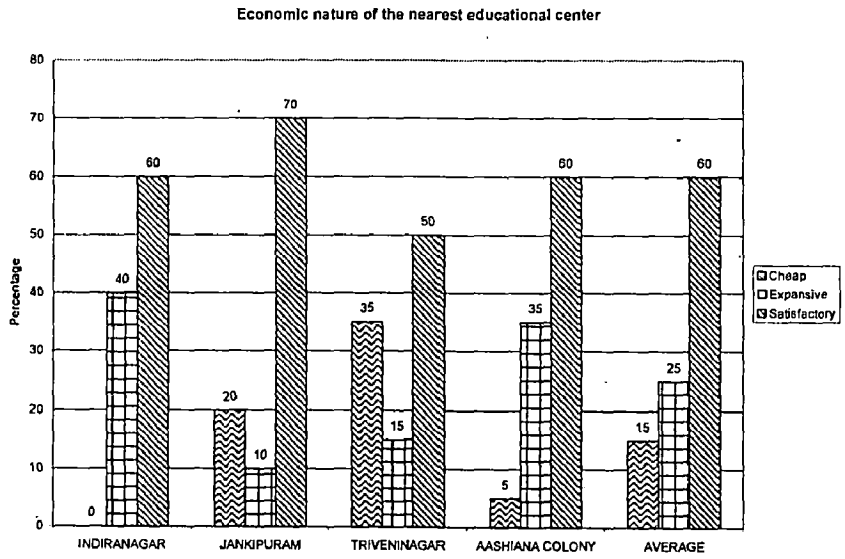
- Indiranagar is rich and Triveninagar lacks with regard to educational centers.

Figure 4.20:



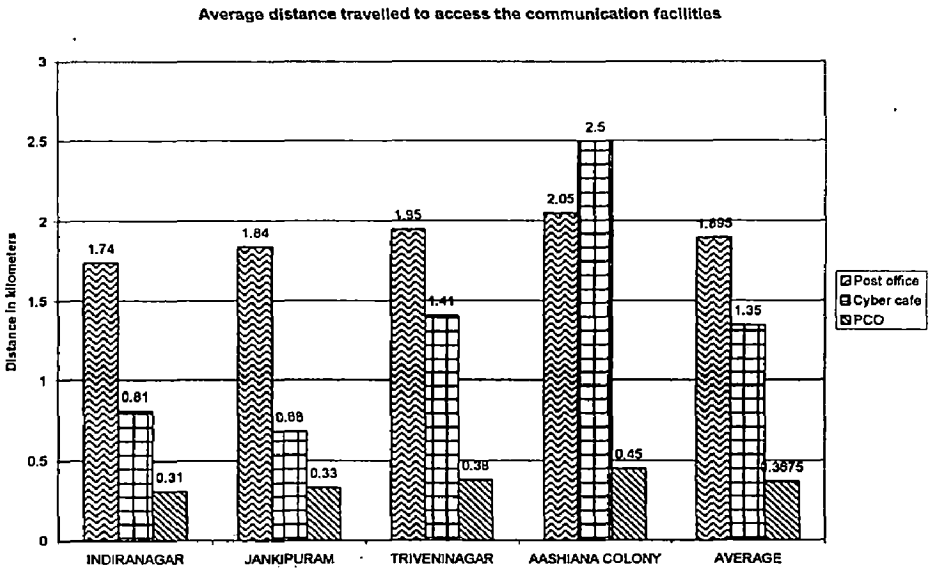
- The major fraction (68.75%) of the educational centers are private as against 31.25% government setups.

Figure 4.21:



- One fourth of the respondents have graded educational facilities as expansive.
- Indiranagar is most and Jankipuram least expansive in this regard.

Figure 4.22:



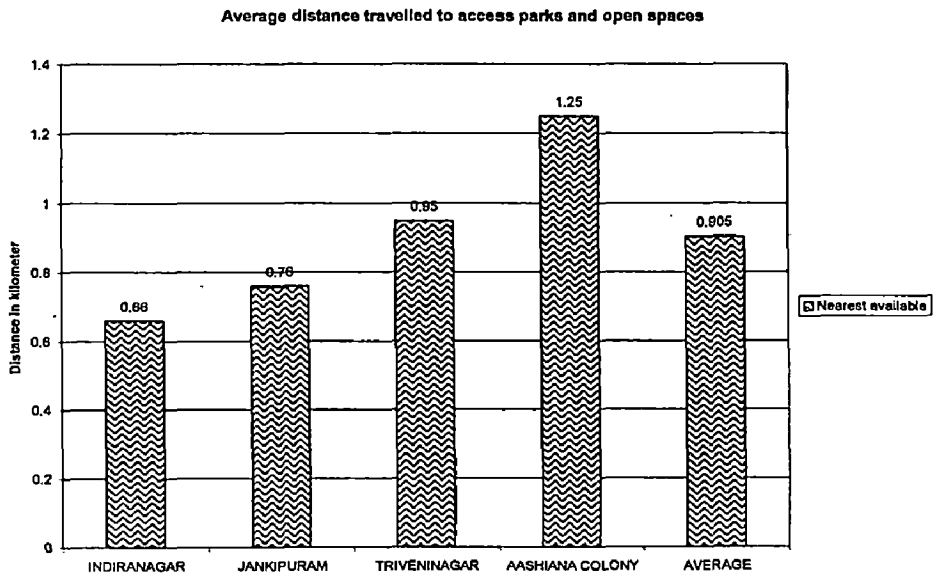
- The average distance traveled to avail the following facilities have been found to be:

  Post office : 1.89 kms.

  Cyber café : 1.35 kms.

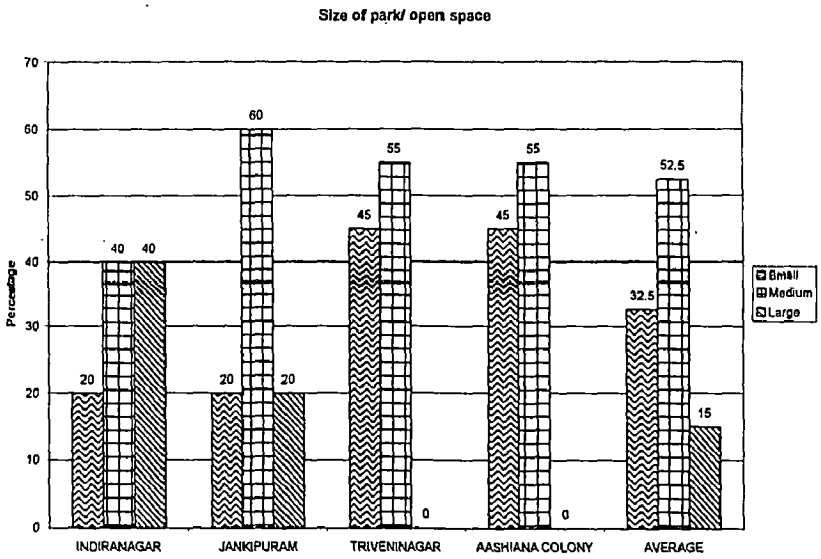
  P.C.O. : 0.36 kms.

Figure 4.23:



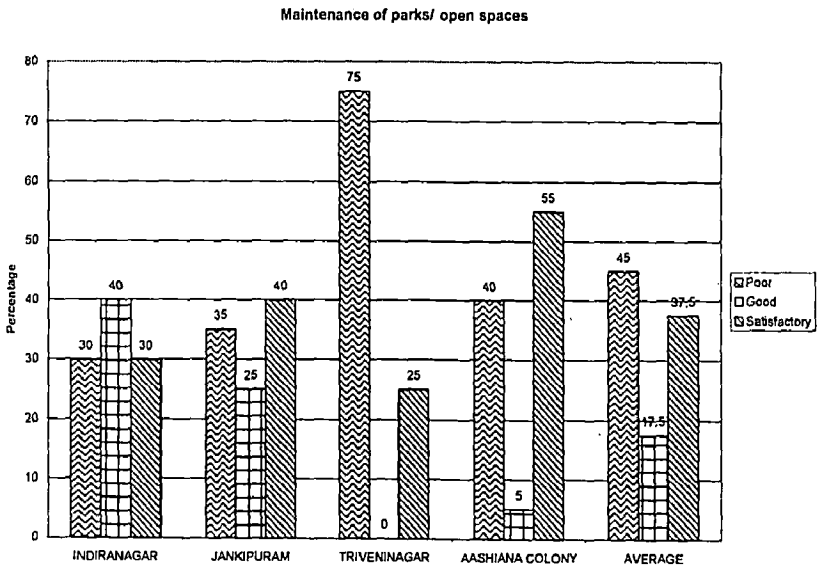
- Parks and open spaces are available at an average distance of 0.9 kms.
- Indiranagar is richest and Aashiana colony is the most lagging in this regard.

Figure 4.24:



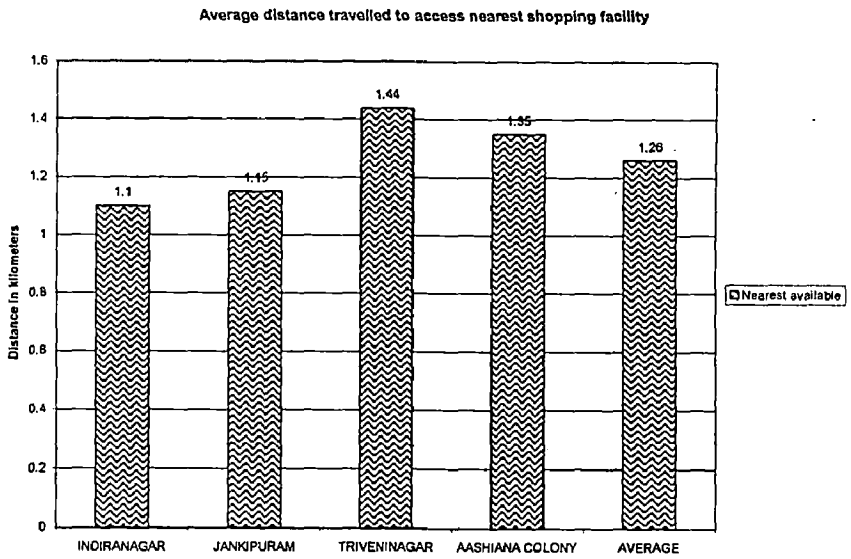
- Majority of the parks and green spaces (52.5%) are medium sized and only 15% are large in size.
- Indiranagar has largest parks, while Triveninagar and Aashiana colony have the smaller ones.

Figure 4.25:



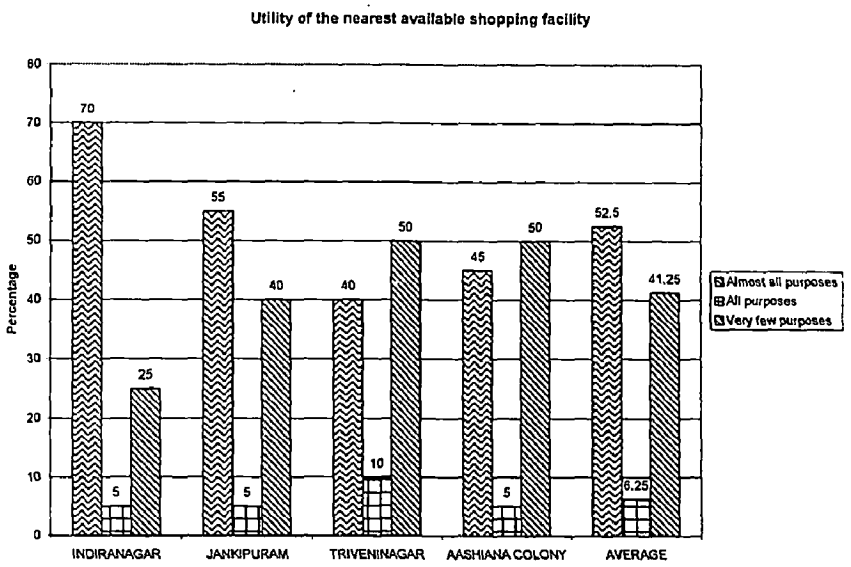
- Almost half (45%) of the respondents have reported the parks/ open spaces to be poorly maintained.
- Triveninagar has the worst parks, while Aashiana colony has the best ones.

Figure 4.26:



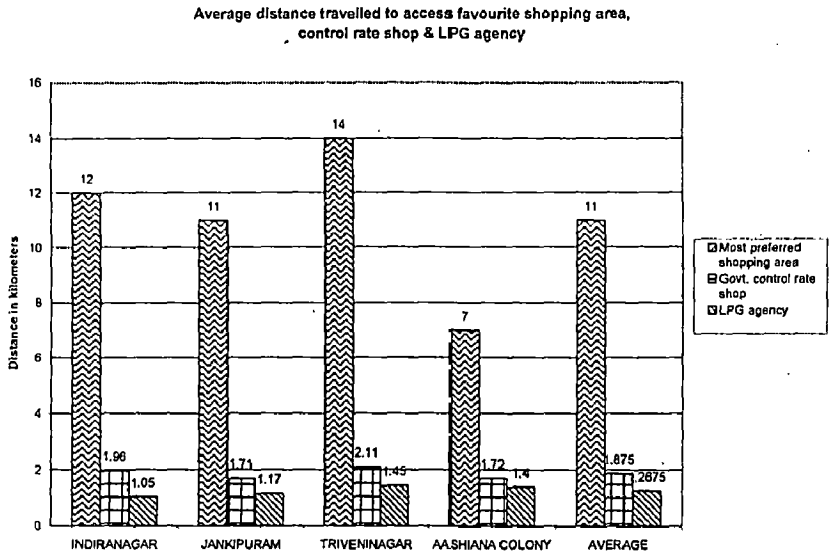
- Shopping facilities are available at an average distance of 1.26 kms.
- Indiranagar is the richest and Triveninagar lacks the most in this regard.

Figure 4.27:



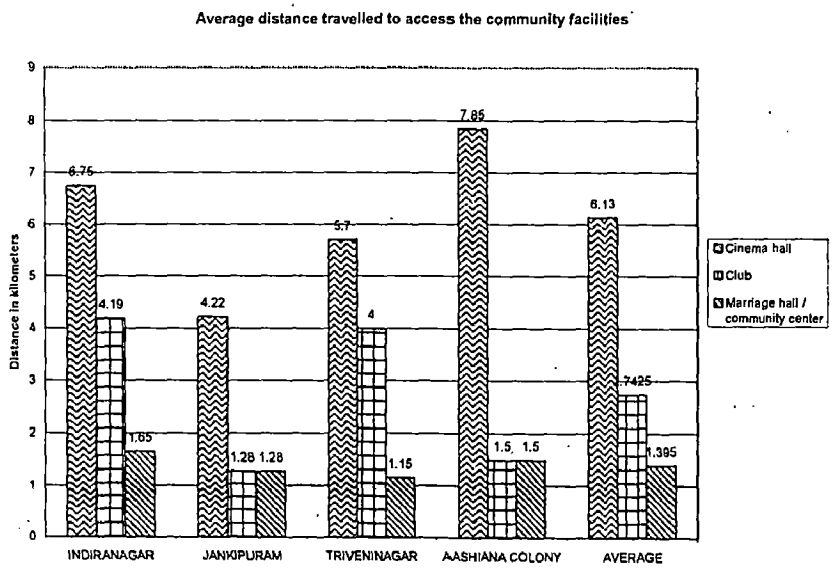
- More than half (52.5%) of the respondents have reported the nearest available shopping facilities to be serving almost all purposes and another 41.25% have found them useful for few purposes only.
- Indiranagar has a higher level of satisfaction and Triveninagar lowest in this regard.

Figure 4.28:



- On an average the most preferred shopping area is located 11 kms. away. Government control rate shop at 1.8 kms. and L.P.G. agency at 1.26 kms.

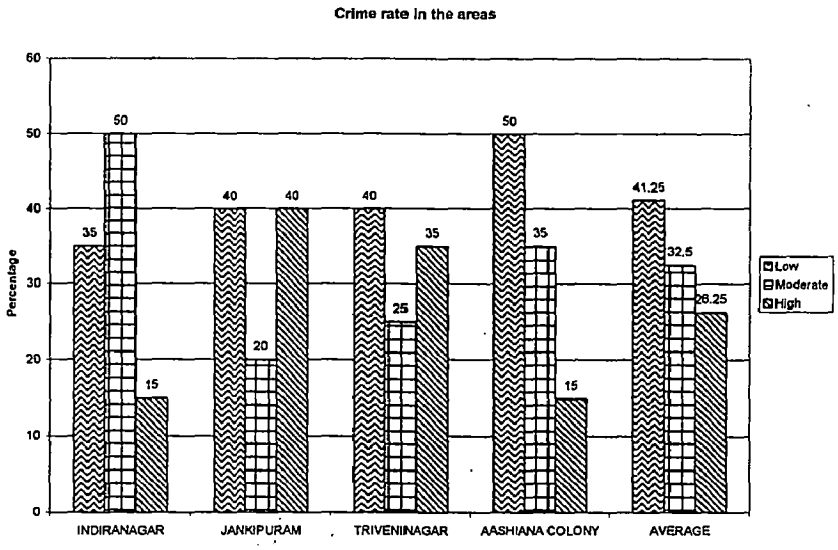
Figure 4.29:



- Recreational facilities are available at an average distances as follows:

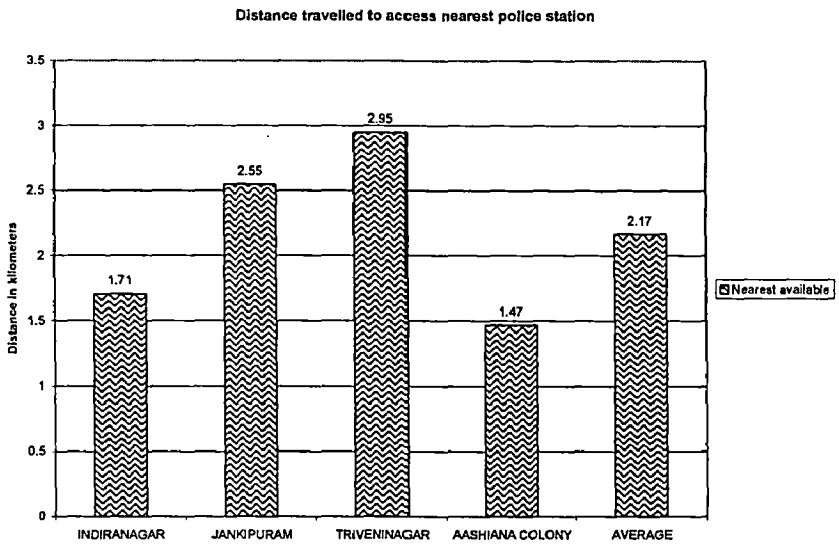
Cinema hall	:	6.13 kms.
Club	:	2.74 kms.
Marriage/ community hall	:	1.39 kms.

Figure 4.30:



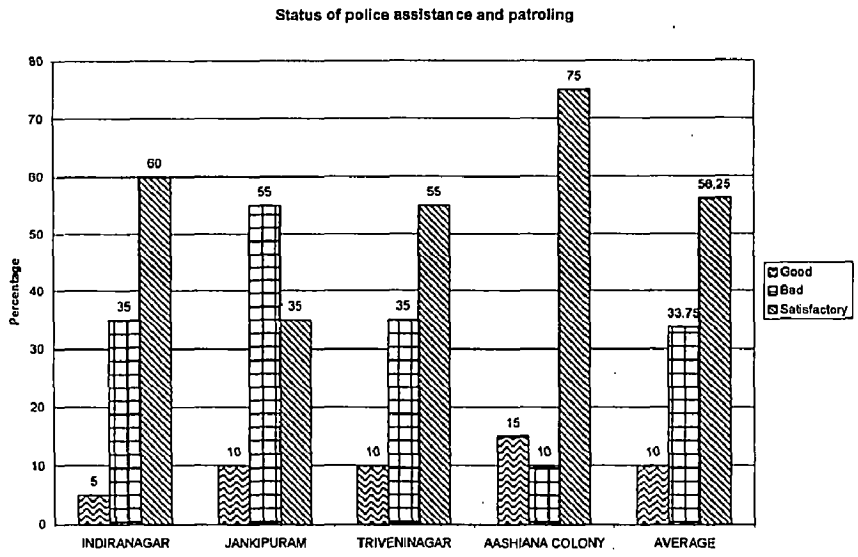
- On an average about half (41.25%) of the respondents have reported the crime rates to be low, while about one fourth (26.25%) have reported it to be high.
- Aashiana colony seems to be the safest as against Indiranagar which has higher crime rates.

Figure 4.31:



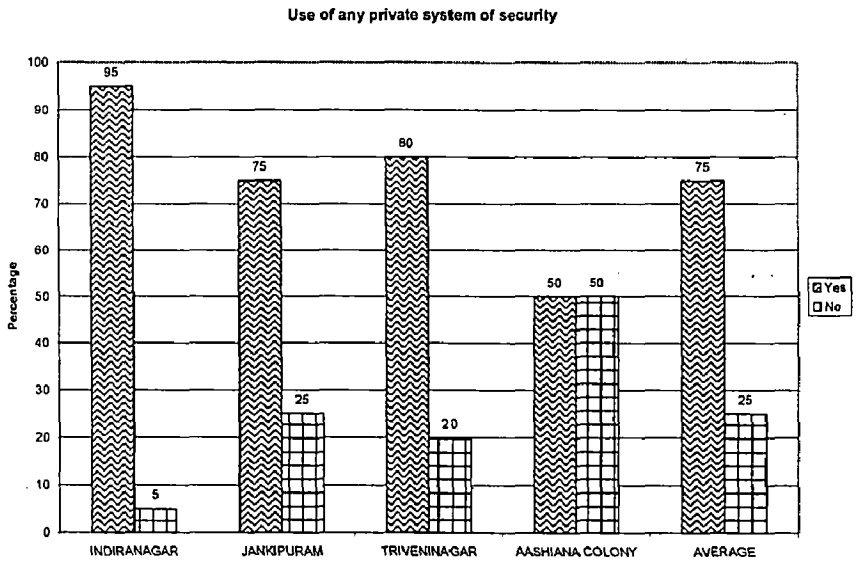
- Nearest police station are located at an average distance of 2.17 kms.

Figure 4.32:



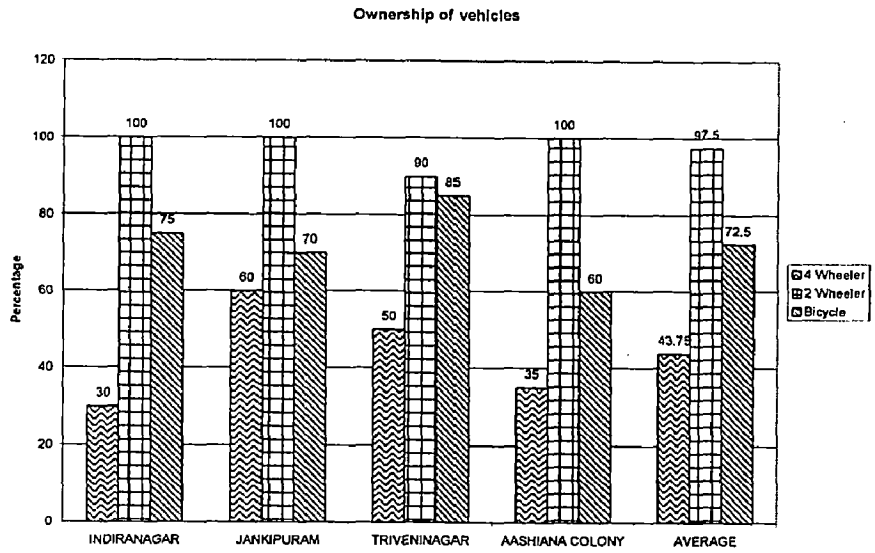
- Only one tenth (10%) of the respondents have rated the police assistance and patrolling to be good as against 33.75% bad and 56.25% satisfactory.
- Aashiana colony is the best and Indiranagar and Jankipuram seem to be worse in this regard.

Figure 4.33:



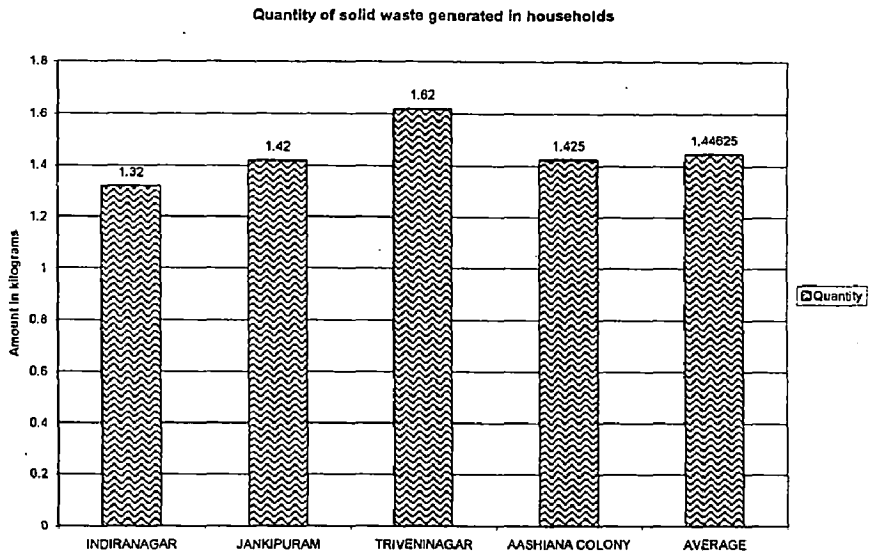
- Three fourth (75%) of the households on an average have arranged some kind of private system of security.
- This is maximum in Indiranagar (95%) and minimum in Aashiana colony (50%), which seems to be more secure.

Figure 4.34:



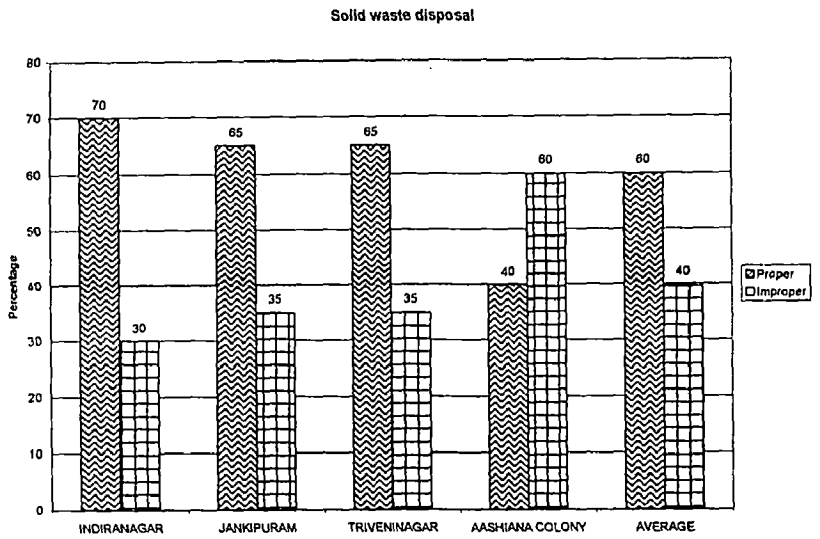
- More people living in Jankipuram own a four wheeler (60%), while in Indiranagar this is lowest (30%).
- Almost all (97.5%) the households have a two wheeler.

Figure 4.35:



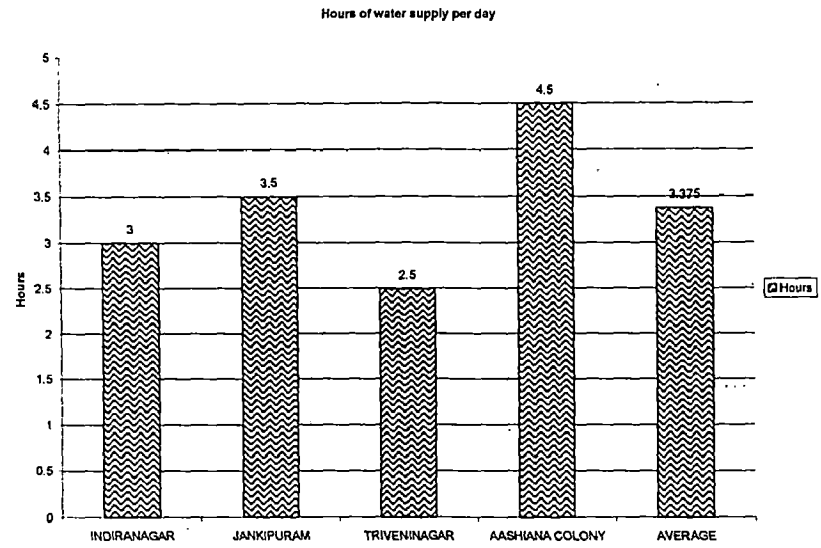
- On an average 1.44 kg solid waste is being generated per household.
- This generation is highest in Triveninagar and lowest in Indiranagar.

Figure 4.36:



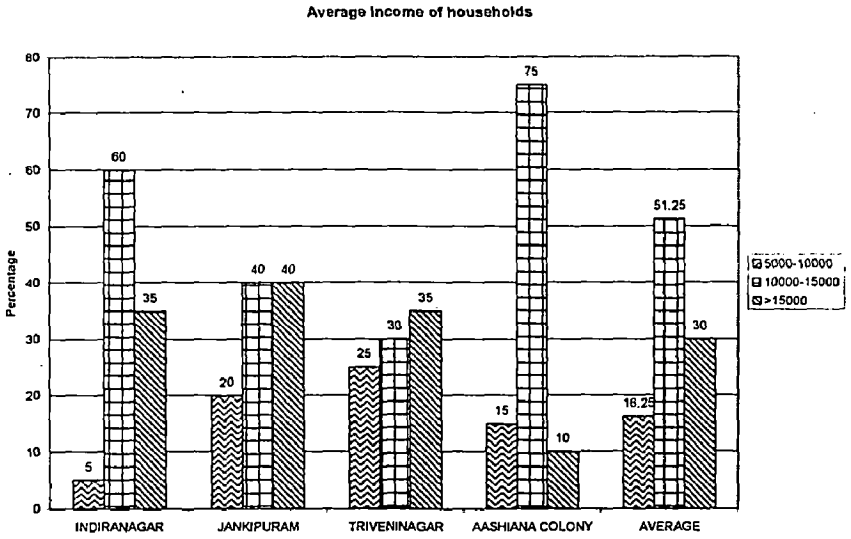
- In More than half (60%) cases the disposal of solid waste is proper.
- Indiranagar is the best and Aashiana colony the worst in this regard.

Figure 4.37:



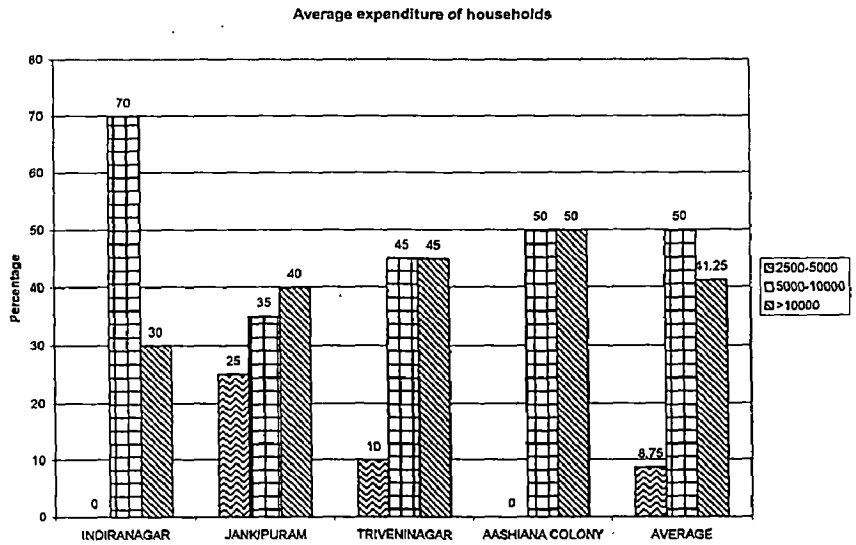
- The average duration of water supply is 3.37 hrs. per day.
- Aashiana colony is the best (having 4.5 hrs. supply) and Triveninagar is the worst (having 2.5 hrs. supply) in this regard.

Figure 4.38:



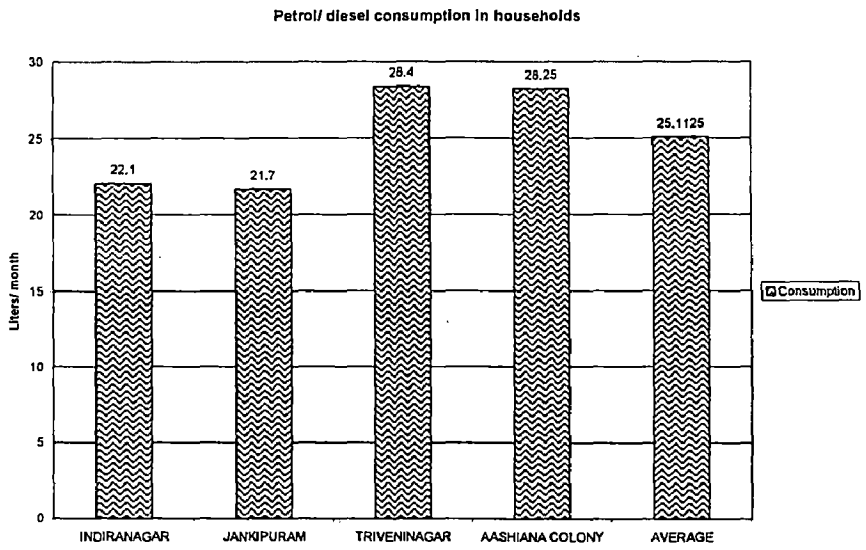
- Majority (51.25%) of the households lie in the income range of 10,000-15,000.
- Indiranagar has a higher fraction of higher income groups, while Triveninagar has shown almost equivalent distribution of various income classes.

Figure 4.39:



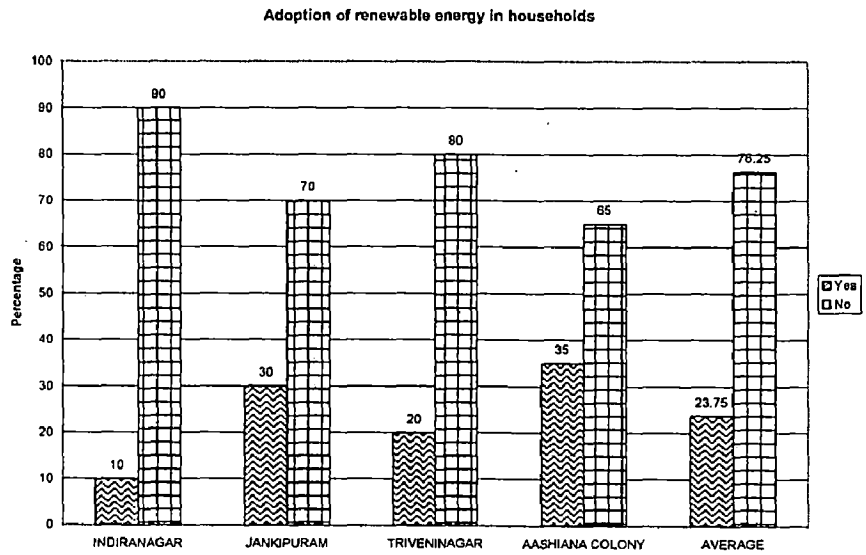
- The average monthly expenditure on electricity has been found to be Rs. 605.62 per household.
- People in Indiranagar are using maximum and those in Aashiana colony are using least electricity.

Figure 4.40:



- The average petrol and diesel consumption per household per month has been found to be 25.11 liters.
- People at Triveninagar are using maximum and those at Jankipuram are using minimum amount of fuel per month, which has a relation to the availability of efficient public transportation system.

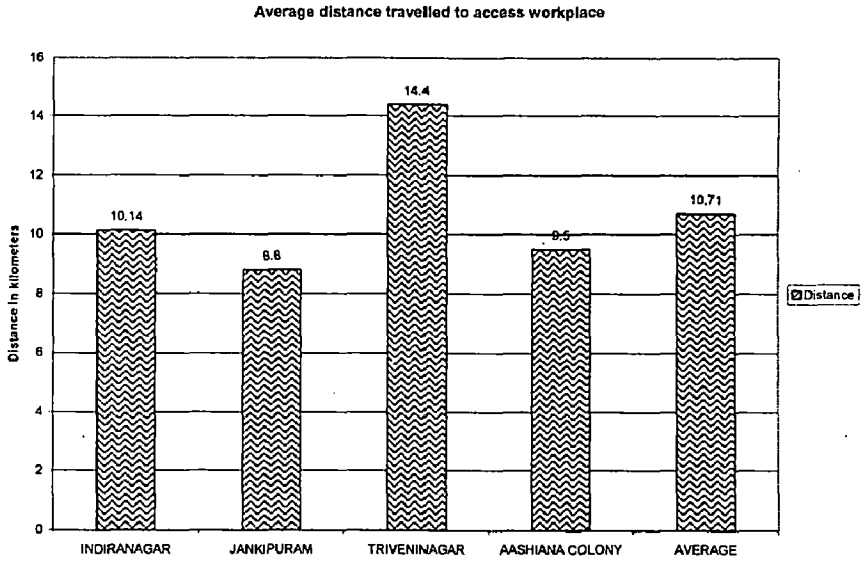
Figure 4.41:



- Only about one fourth (23.75%) of the households have adopted renewable sources of energy.

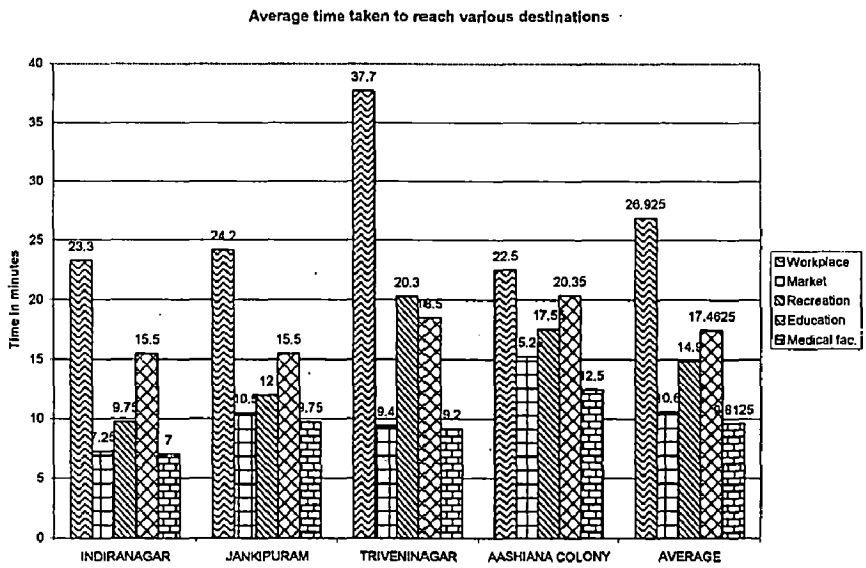
- Maximum 35% of households at Aashiana colony and minimum 10% of the households at Indiranagar have adopted these sources.

Figure 4.42:



- The average distance traveled to reach the workplace has been found to be 10.71 kms.
- People at Jankipuram are traveling minimum and those at Triveninagar are traveling maximum distances to reach the respective workplaces.

Figure 4.43:



- The average time taken to reach for the various places by the dwellers of different areas are as follows:

S.No.	Destination	Average Time Taken	Minimum Time Taken in	Maximum Time Taken in
1	Workplace	26.9 min.	Aashiana colony	Triveninagar
2	Market	10.6 min.	Indiranagar	Aashiana colony
3	Recreation	14.9 min.	Indiranagar	Triveninagar
4	Educational	17.46 min.	Indiranagar	Aashiana colony
5	Medical	9.61 min.	Indiranagar	Aashiana colony

- Indiranagar seems to be the best area as regard to the time taken to access various facilities (implying the close and easy availability of the amenities and services) and Aashiana colony seems to be the worst in this regard.

4.3.2 The following inferences have been drawn from the comparative analysis under various heads of the areas promoted by the government authorities and private agencies:

Key: (P) – The areas promoted by the private firms/ agencies.

(G) – The areas promoted by the government authorities.

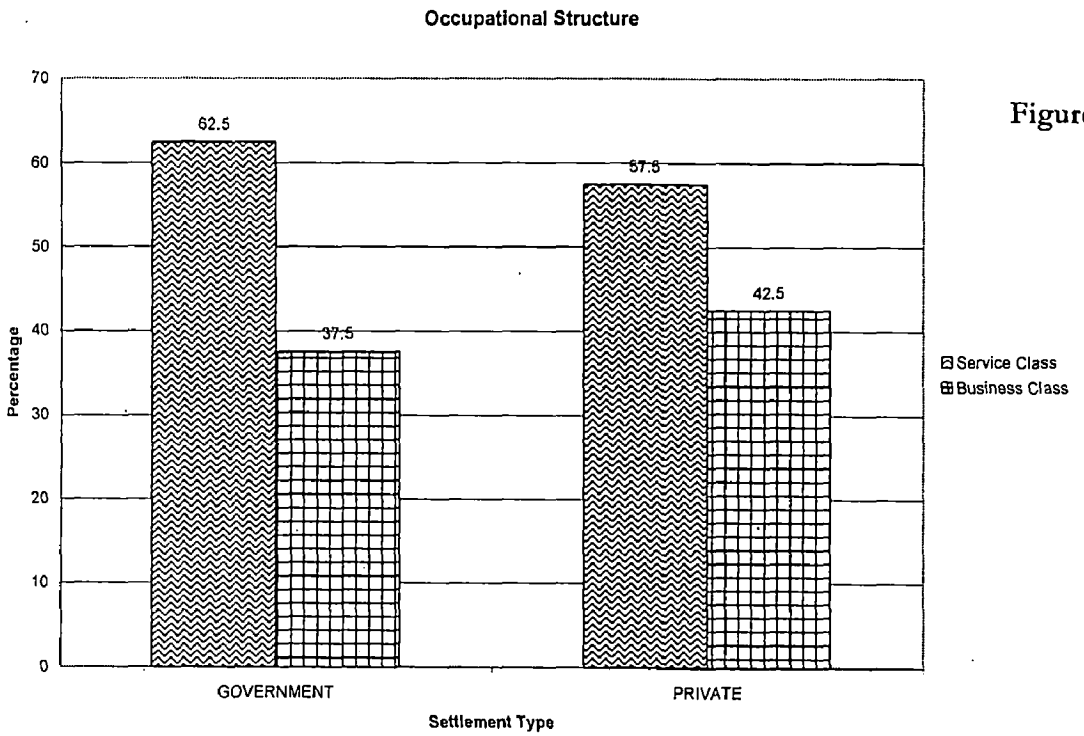


Figure 4.44

- The fraction of service class has been observed to be higher (62.5%) in G as against 57.5% in P.
- In general, the fraction of service class (60%) is higher than the business class (40%) in the city.

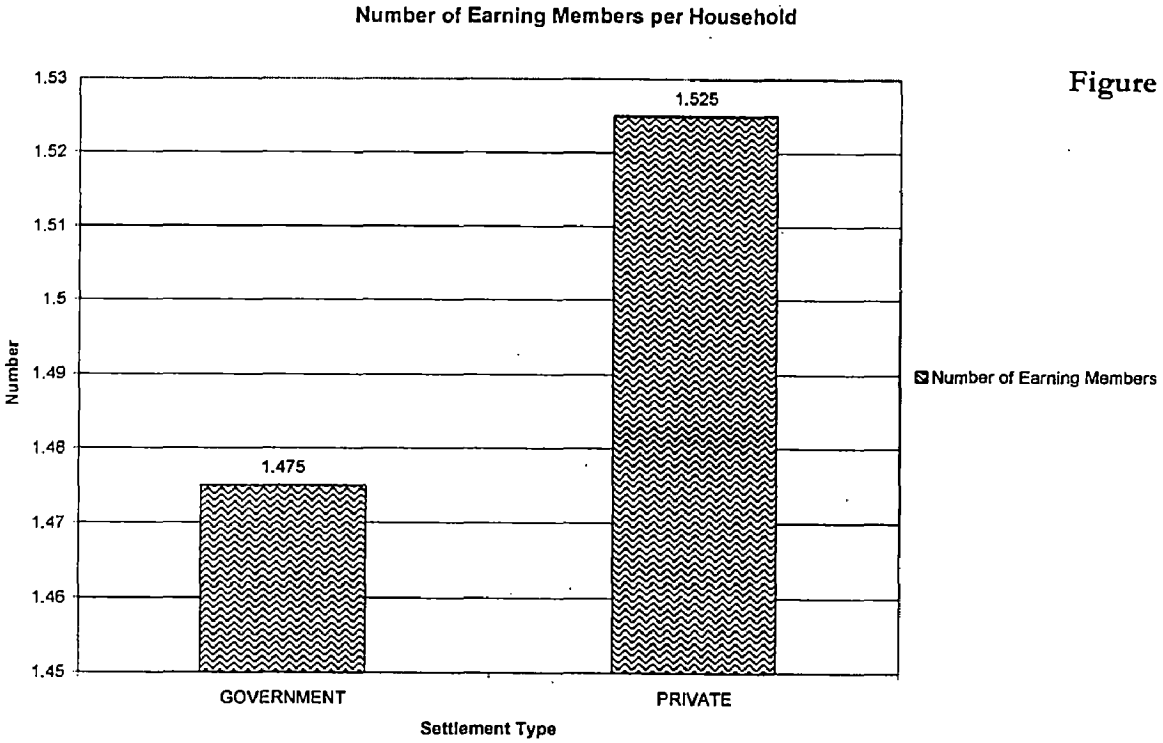


Figure 4.45

- Number of earning members has been found to be higher in the P areas (1.52) as against the G areas (1.47), and the overall average being 1.5.

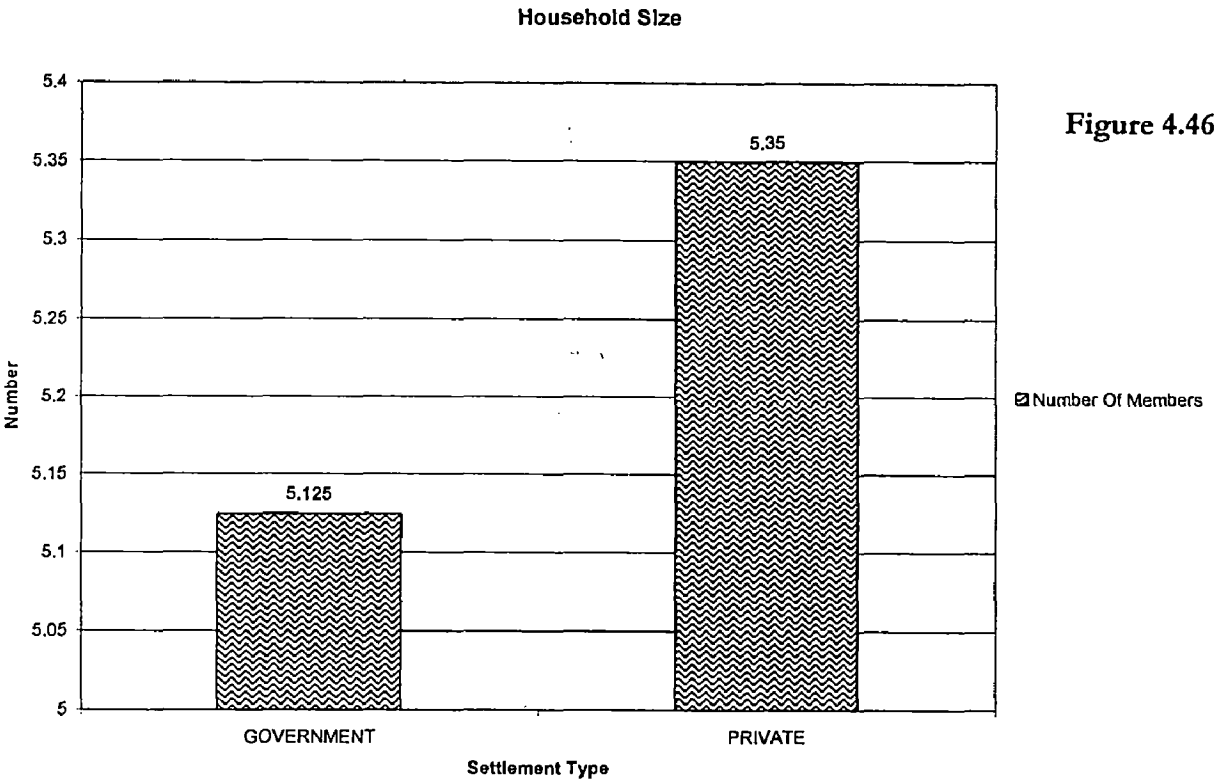


Figure 4.46

- The average household size has been found to be higher in P (5.35) as against (5.12) in the G areas. The overall average being 5.23.

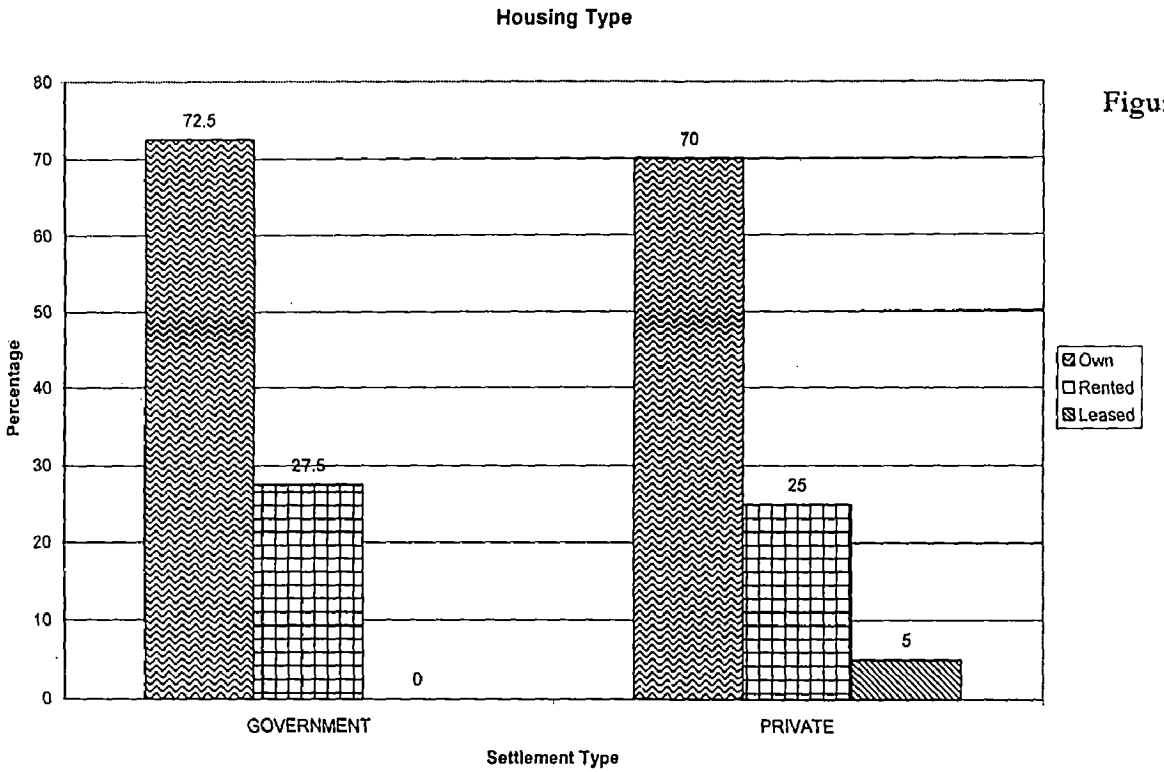


Figure 4.47

- In the G settlements the fraction of the people living in the rented accommodations has been found to be greater.
- Majoriry of the people in the city have their own residences (average – 71.25%).

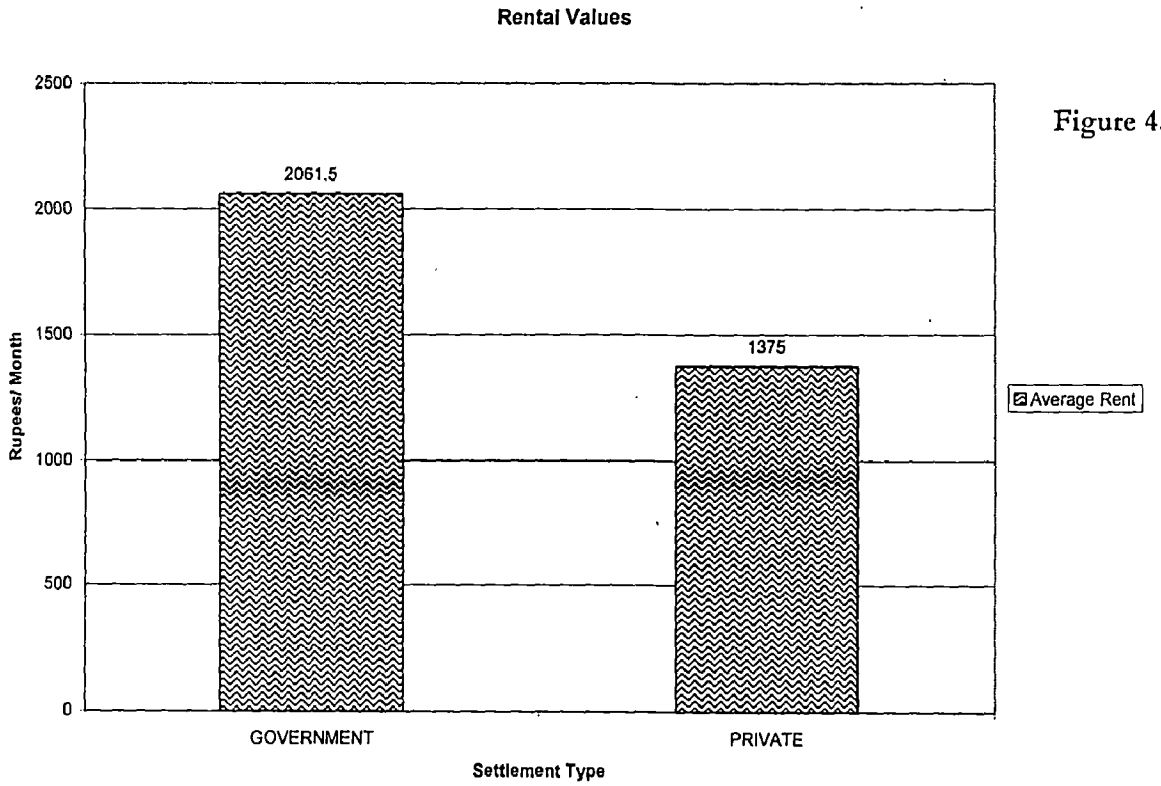


Figure 4.48

- The rental values are higher in the G areas as against P settlements. Average rent – Rs. 1718.25 / month.

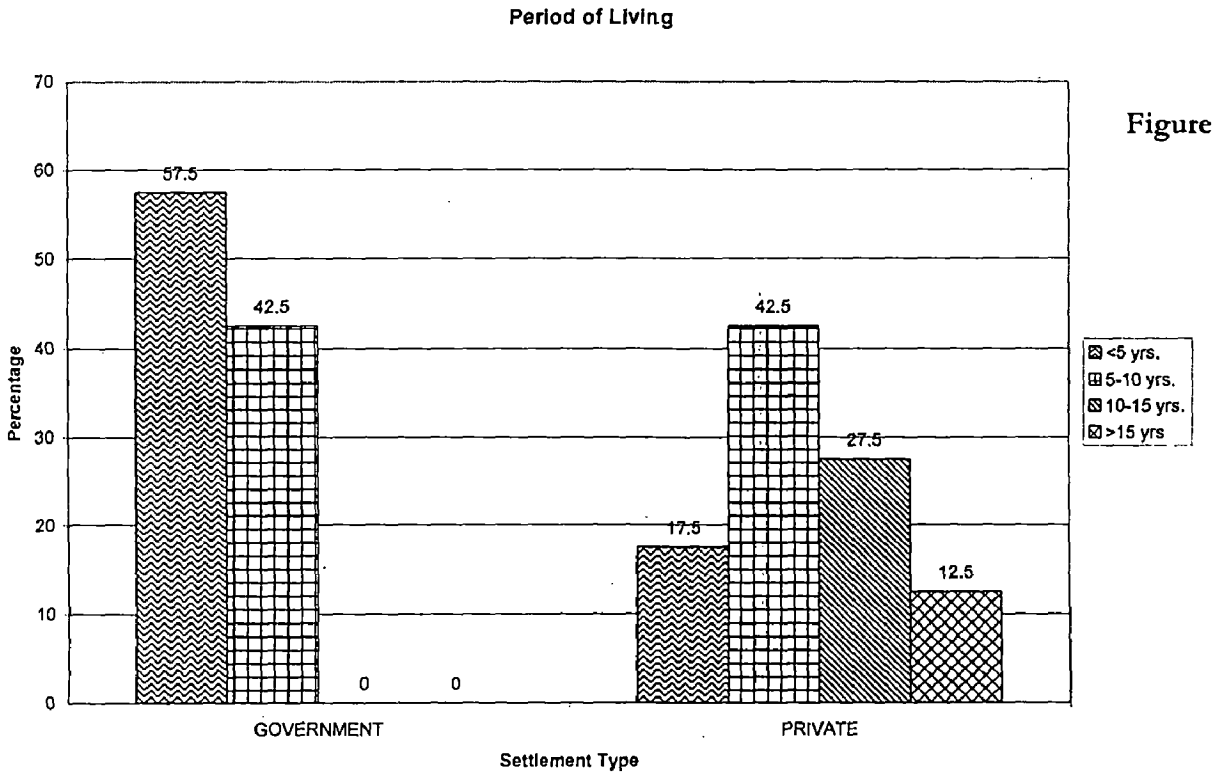


Figure 4.49

- It seems that people tend to occupy the G colonies in early stages of settlement as compared to the P areas where there has been continuous influx of people with time.
- In P settlements people first judge the success rates and then occupy the area.
- Maximum people have been observed to occupy the G areas within <5 years and the P areas during past 5 – 10 years.

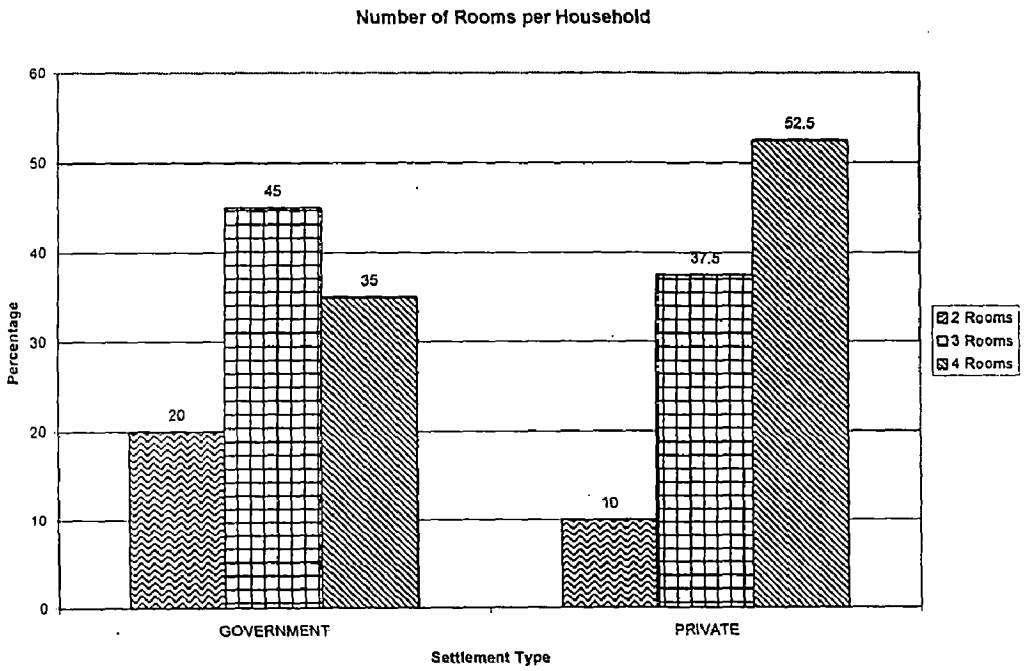


Figure 4.50

- More households from G have 3 rooms and that from P have 4 rooms.
- There are more rooms in P houses and more variation in the number of rooms as well.

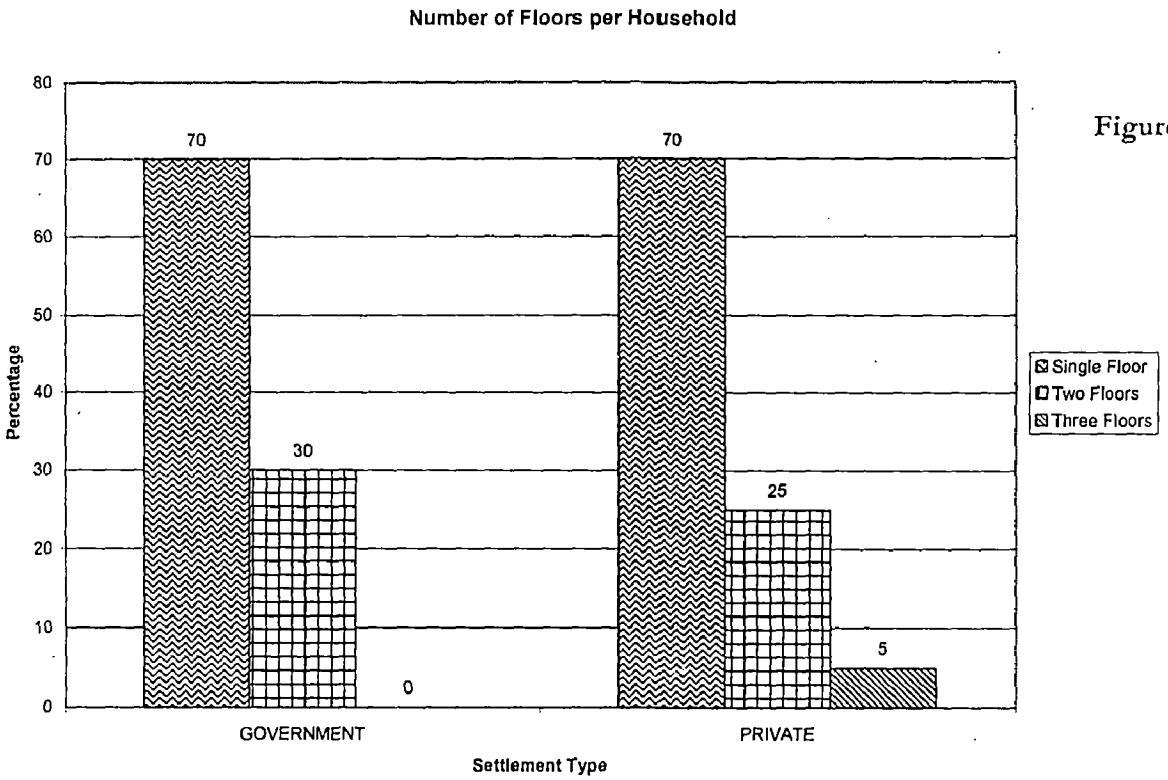


Figure 4.51

- Majority of the houses are single storied (70%).
- P settlements have more units with more than two floors.
- G settlements are confined to 2 floors.

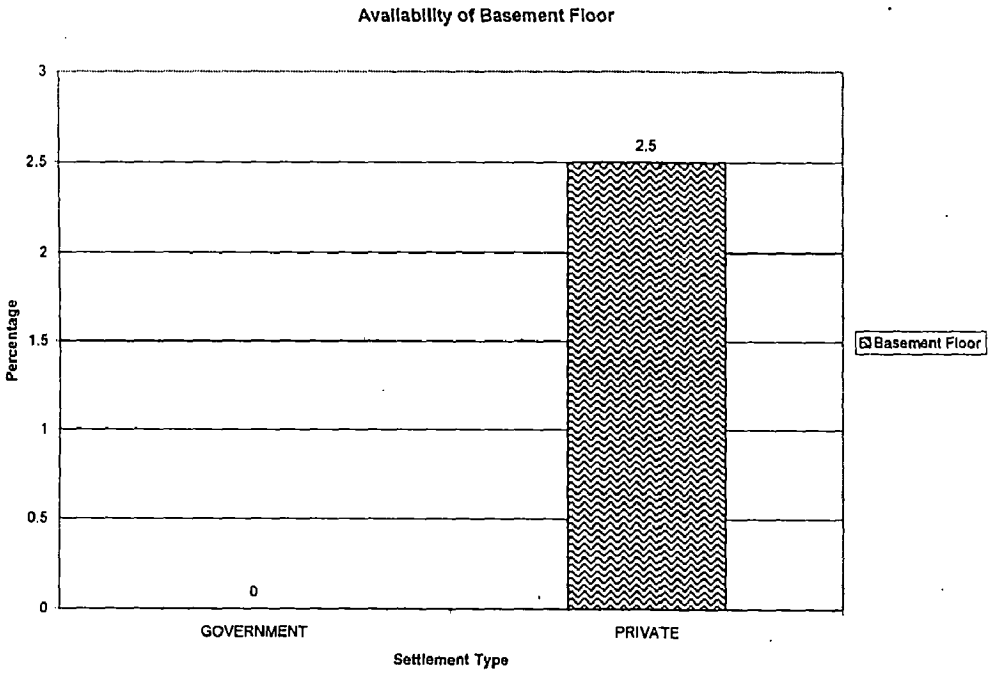


Figure 4.52

- Very small fraction of the households have got the basement floor (average – 1.25%).

- This too is confined to the P areas only.

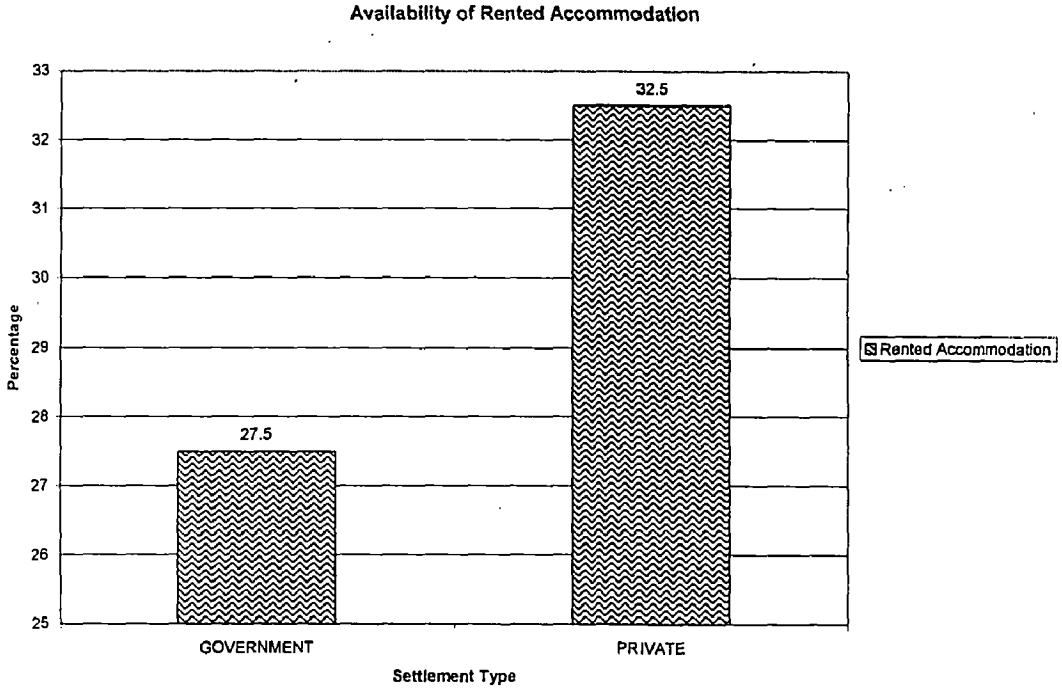


Figure 4.53

- P have more rental accommodation available as against G.
- Average availability is in 30% households.

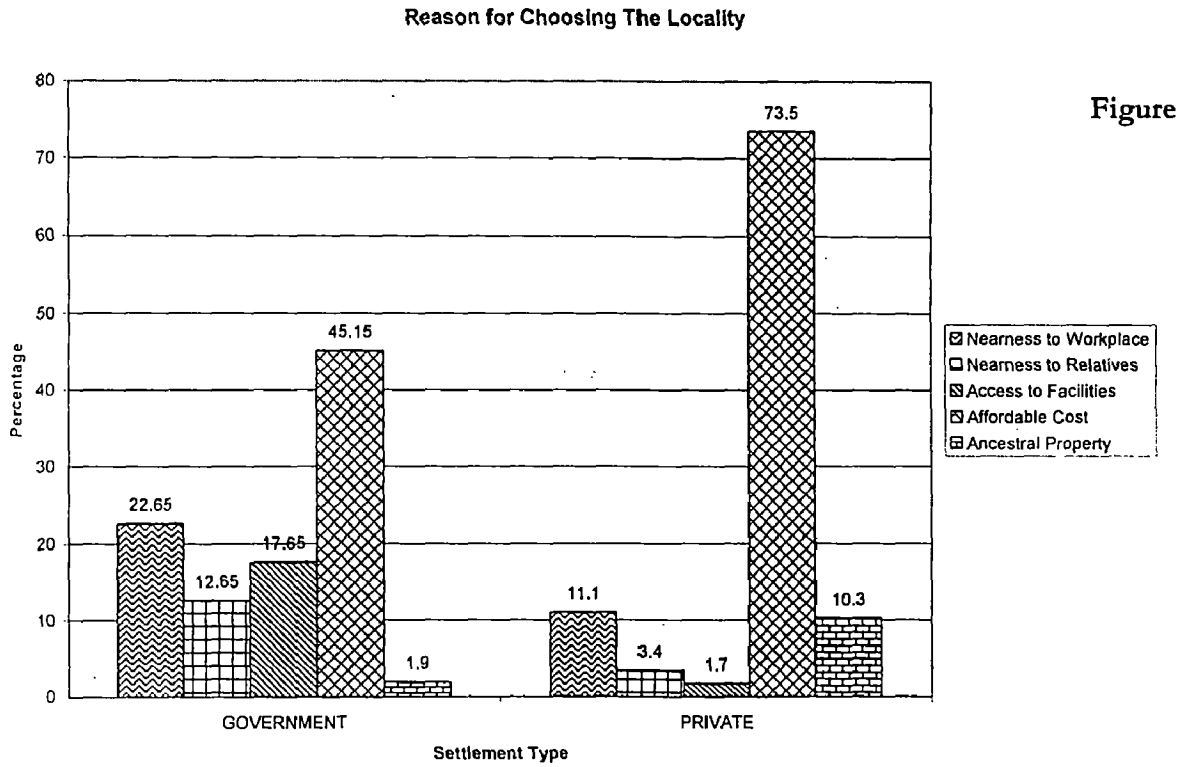


Figure 4.54

- The major determinant of choice is the land cost (average 59.3%).
- Second major determinant is the nearness to workplace (average 16.87%).
- Third determinant is the access to facilities.

- In the P settlements the land cost has extremely consideration whereas in G areas the access to facilities also plays an important role.

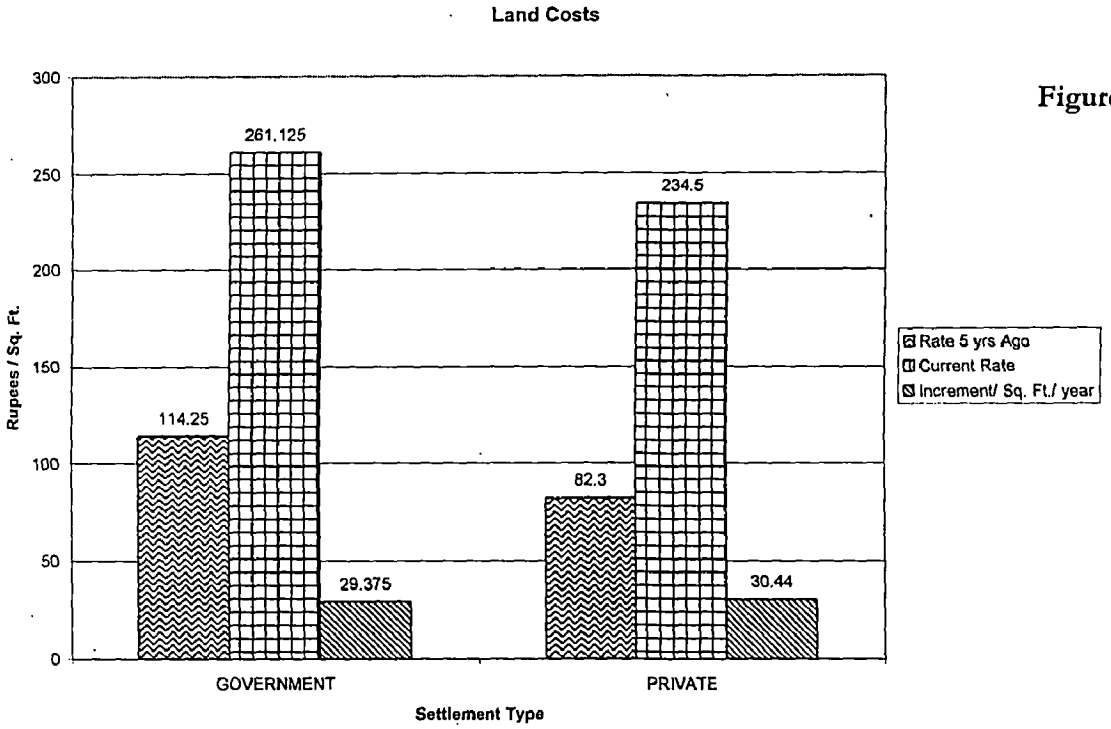


Figure 4.55

- The land costs have been found to hike rapidly in G settlements within past 5 years.
- The average costs in general have always been higher in the G settlements than that in P areas.
- The average rate of increase of the land costs has been Rs.29.9 /sq.ft./year.

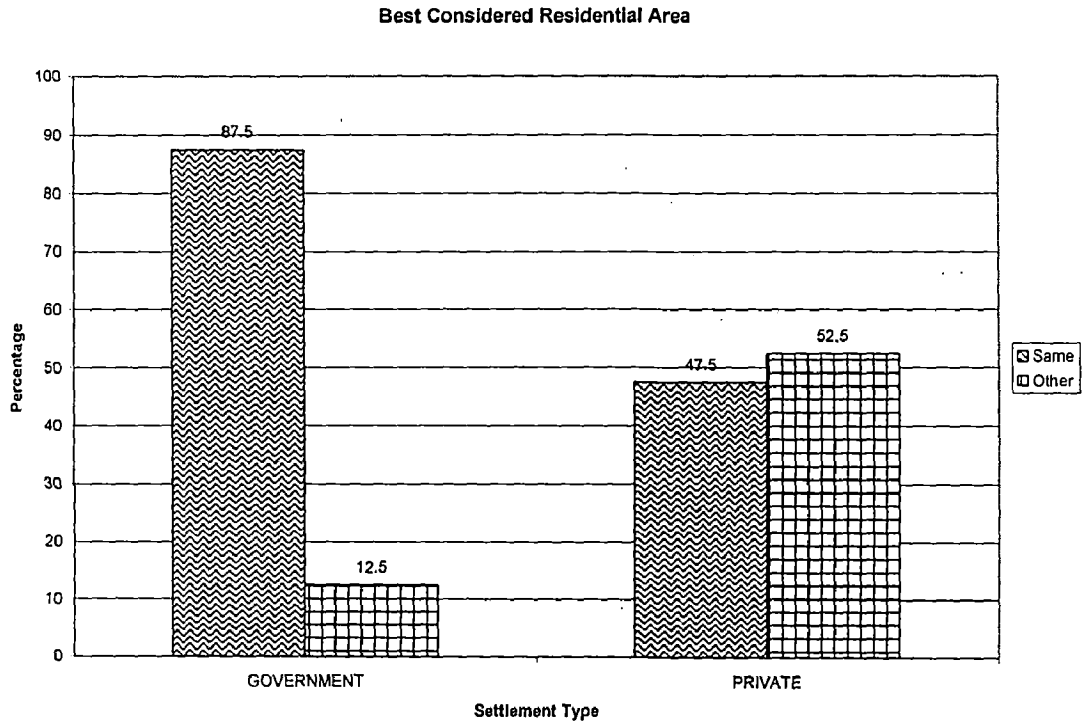


Figure 4.56

- Greater fraction (87.5%) of the G areas residents seem to be satisfied with their current place of residence, which reflects better living conditions in general.
- In P areas, more persons seem to be dissatisfied as they have claimed other places as better to live in.

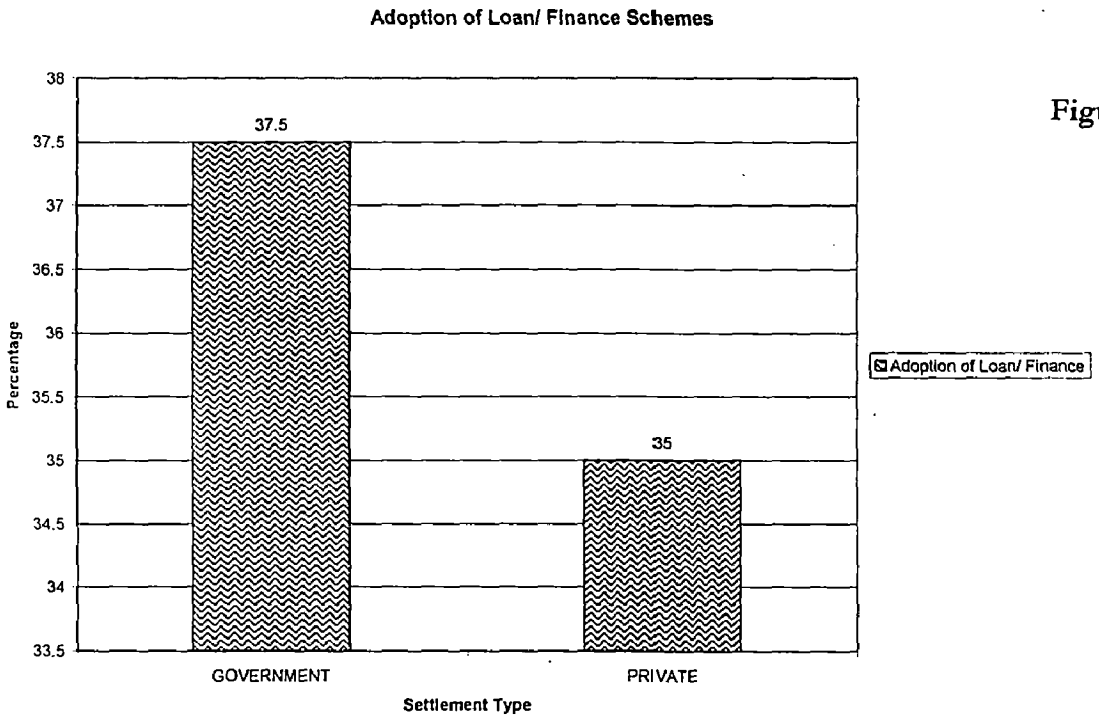


Figure 4.57

- Major fraction of loan takers is from G (probably due to the regular income flow).
- On an average 36.25% households have availed loans.

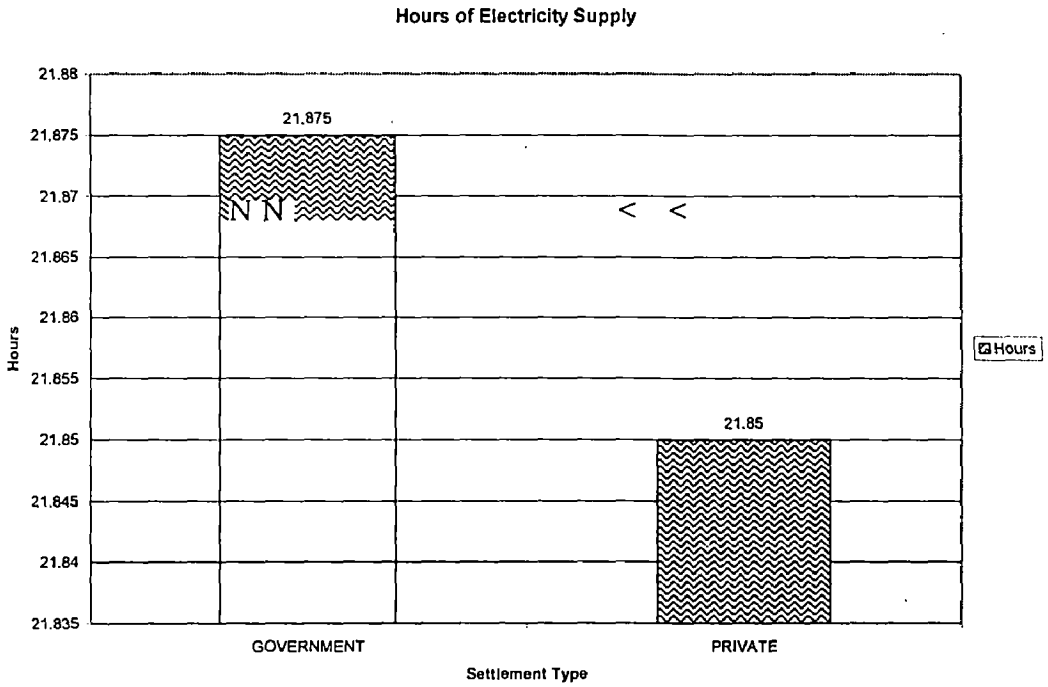


Figure 4.58

- Electricity supply has been found to be slightly better in the G areas.
- Average supply hours being 21.86 hrs.

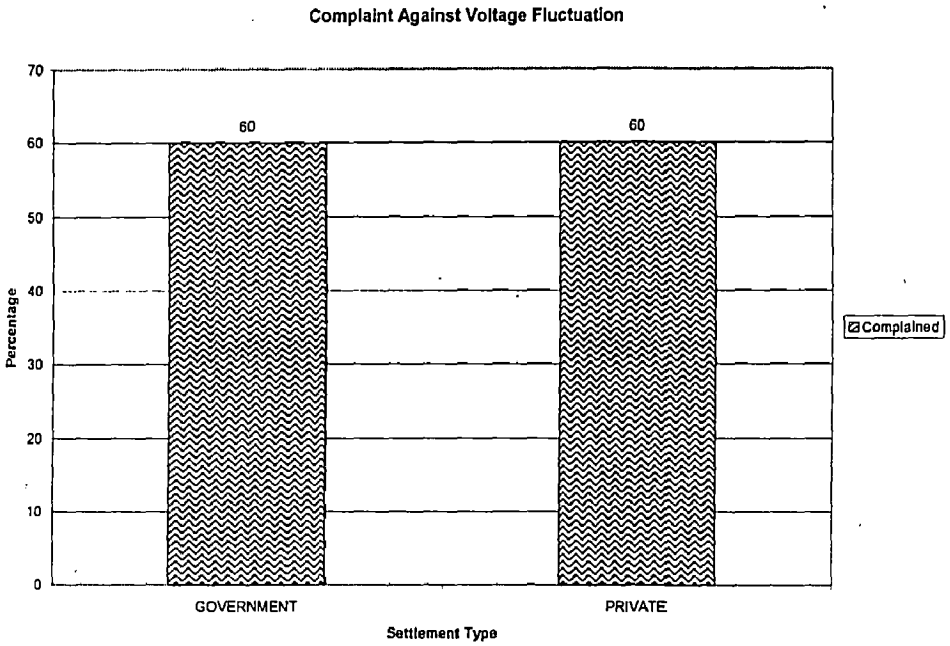


Figure 4.59

- Both G and P areas have been found to be suffering from voltage fluctuation.
- On an average almost 60% households have complained against voltage fluctuation.

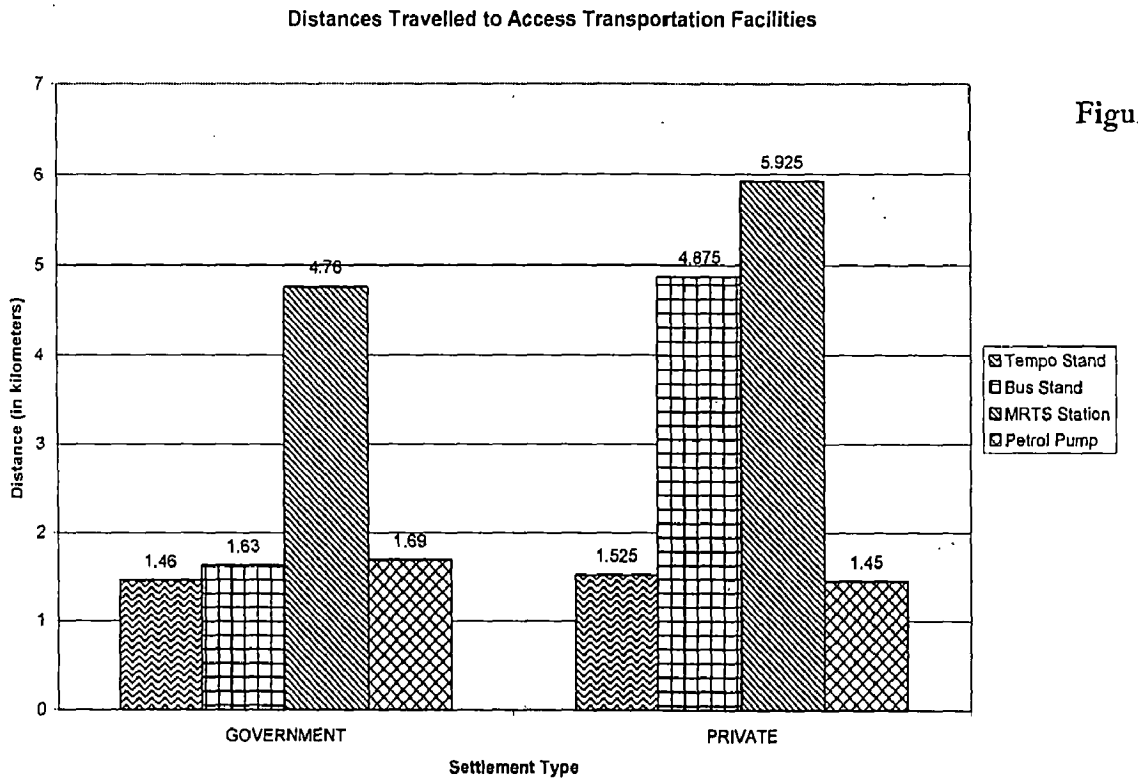


Figure 4.60

- Tempo stands are at an average distance of 1.49 kms.
- Bus stands are better in G areas, being 1.63 kms. as against 4.875 kms. in the P areas.
- M.R.T.S. is far off both the areas (P and G), average distance being 5.34 kms.
- Petrol pumps seem to be sufficient in numbers as the average distance has been found to be 1.57 kms.

	Crime rate (percentage distribution)					
23a	Low	35	40	40	50	41.25
	Moderate	50	20	25	35	32.5
	High	15	40	35	15	26.25
	Average distance of the nearest police station	1.71	2.55	2.95	1.47	2.17
	Police assistance and patrolling (percentage distribution)					
	Good	5	10	10	15	10
23b	Bad	35	55	35	10	33.75
	Satisfactory	60	35	55	75	56.25
	Any pvt. System of security (percentage distribution)					
	Yes	95	75	80	50	75
	No	5	25	20	50	25
	Percentage of people having a car	30	60	50	35	43.75
24	Percentage of people having 2- wheeler	100	100	90	100	97.5
	Percentage of people having bicycles	75	70	85	60	72.5
25	Major pollution and Hygene problem	Water stagnation(34.8%)	Water stagnation(40.5%)	Water stagnation(41.2%)	None(35%)	Water stagnation
	Second major pollution and hygene problem	Flies & mosquitos(32.7%)	Foul smell (garbage)(27%)	Flies & mosquitos(26.4%)	Water stagnation(35%)	Flies & mosquitos
	Third major pollution and hygene problem	Noise (traffic)(11.6%)	Noise (traffic)(16.2%)	Foul smell(26.4%)	Flies & mosquitos(20%)	Garbage collection (smell)
	Average hours of water supply (per day)	3	3.5	2.5	4.5	3.375
	Average quantity of solid waste generated per day per household	1.32	1.42	1.62	1.425	1.44625
26	Subsequent processing (percentage distribution)					
	Collected by sweepers (paid by community)	70	65	65	40	60
	Thrown into vaccant plots or nearby	30	35	35	60	40
	Average gross family income per month (percentage distribution)					
	5000-10000	5	20	25	15	16.25
	10000-15000	60	40	30	75	51.25
27	>15000	35	40	35	10	30
	Average gross family expenditure per month (percentage distribution)					
	2500-5000	0	25	10	0	8.75
	5000-10000	70	35	45	50	50
	>10000	30	40	45	50	41.25
28	Average electricity consumption (rupees/month)	760	612.5	600	450	605.625
29	Average LPG consumption per month (number of cylenders)	1.51	1.6	1.39	1.3	1.45
30	Average petrol consumption per month (amount in litres)	22.1	21.7	28.4	28.25	25.1125
31	Application of renewable energy (percentage of people)	10	30	20	35	23.75
	N.A.	90	70	80	65	76.25
32	Average distance travelled to reach workplace (in k.m.s)	10.14	8.8	14.4	9.5	10.71
	Average Time taken to reach workplace (minutes)	23.3	24.2	37.7	22.5	26.925
	Average Time taken to reach market (minutes)	7.25	10.5	9.4	15.25	10.6
33	Average Time taken to reach place of recreation (minutes)	9.75	12	20.3	17.55	14.9
	Average Time taken to reach education (minutes)	15.5	15.5	18.5	20.35	17.4625
	Average Time taken to reach medical facilities (minutes)	7	9.75	9.2	12.5	9.6125

	Nature of the facility (percentage distribution)					
17b	Government owned	5	0	0	0	1.25
	Private	95	100	100	100	98.75
	Economic factor (percentage distribution)					
17c	Cheap	5	5	30	10	12.5
	Expansive	75	45	20	15	38.75
	Satisfactory	20	50	50	55	43.75
18a	Average distance of nearest educational facility	0.78	2.7	3.6	1.65	2.1825
	Nature of the facility (percentage distribution)					
18b	Government owned	10	70	40	5	31.25
	Private	90	30	60	95	68.75
	Economic factor (percentage distribution)					
18c	Cheap	0	20	35	5	15
	Expansive	40	10	15	35	25
	Satisfactory	60	70	50	60	60
19	Average distance of the nearest post office	1.74	1.84	1.95	2.05	1.895
	Average distance of the nearest cyber café	0.81	0.68	1.41	2.5	1.35
	Average distance of the nearest PCO	0.31	0.33	0.38	0.45	0.3675
	Number of post boxes (insufficient %)	75	65	70	65	57
	Sufficient%	25	35	30	35	43
20a	Average distance of the nearest park or open space	0.66	0.76	0.95	1.25	0.905
	Size of the park / open space (percentage distribution)					
20b	Small	20	20	45	45	32.5
	Medium	40	60	55	55	52.5
	Large	40	20	0	0	15
	Maintenance of the park / open space (percentage distribution)					
20c	Poor	30	35	75	40	45
	Good	40	25	0	5	17.5
	Satisfactory	30	40	25	55	37.5
21a	Average distance of the nearest convenient shopping	1.1	1.15	1.44	1.35	1.26
	Useful for (percentage distribution)					
21b	Almost all purposes	70	55	40	45	52.5
	All purposes	5	5	10	5	6.25
	Very few purposes	25	40	50	50	41.25
21c	Most prefferred shopping area	Aminabad (40%)	Aminabad (50%)	Aminabad(50%)	Aminabad(25%)	Aminabad(42%)
	Second area	Bhootnath(30%)	Hazratganj (35%)	Daliganj(30%)	Banglabazar(45%)	
	Third area	Hazratganj(20%)	Kapoorthala (15%)	Hazratganj(10%)	Aminabad(30%)	Hazratganj(15%)
	Average distance of the most preferred shopping area	12	11	14	7	11
	Average distance of the nearest controlled rate shop	1.96	1.71	2.11	1.72	1.875
	Average distance of the nearest LPG agency	1.05	1.17	1.45	1.4	1.2675
	Average distance of the nearest cinema hall	6.75	4.22	5.7	7.85	6.13
22	Average distance of the nearest club	4.19	1.28	4	1.5	2.7425
	Average distance of the nearest marriage hall / community hall	1.65	1.28	1.15	1.5	1.395

Survey Data Compilation:

Appendix E

S.No	HEAD \ AREA	INDIRANAGAR	JANKIPURAM	TRIVENINAGAR	AASHIANA COLONY	AVERAGE
	Percentage of service class	65	60	55	60	60
1	Percentage of business class	35	40	45	40	40
	Number of earning members per household	1.5	1.45	1.75	1.3	1.5
	Average number of family members	5.25	5	6.05	4.65	5.2375
	Percentage of owned houses	70	75	75	65	71.25
2	Percentage of rented houses	30	25	25	25	26.25
	Percentage of leased houses	0	0	0	10	2.5
3	Average rent (rupees per month)	2083	2040	1500	1250	1718.25
	Percentage of people living for <5 yrs.	65	50	25	10	37.5
4	Percentage of people living from 5-10 yrs.	35	50	35	50	42.5
	Percentage of people living from 10-15 yrs.	0	0	25	30	13.75
	Percentage of people living for >15 yrs.	0	0	15	10	6.25
4a	Average distance of the previous place of residence (kms)	8.2	7.65	8.86	9.3	8.5025
	Percentage of households having 2 rooms	35	5	5	15	15
5	Percentage of households having 3 rooms	35	55	45	30	41.25
	Percentage of households having 4 rooms	30	40	50	55	43.75
	Percentage of households having single floor	75	65	55	85	70
6	Percentage of households having two floor	25	35	35	15	27.5
	Percentage of households having three floors	0	0	10	0	2.5
7	Percentage of houses having basement	0	0	5	0	1.25
8	Percentage of houses having rented accommodation	15	40	40	25	30
	Reason for choosing this locality to live in (percentage of responses)					
	Nearness to workplace	15.3	30	17.2	5	16.875
9	Nearness to relatives	15.3	10	6.8	0	8.025
	Access to facilities	15.3	20	3.4	0	9.675
	Affordable cost	50.3	40	62	85	59.325
	Ancestral property	3.8	0	10.6	10	6.1
	Average land cost five years ago (rupees/sq.ft.)	121	107.5	39.6	125	98.275
10	Current average land cost (rupees/sq.ft.)	271	251.25	229	240	247.8125
	Rate of increase of land cost (rupees/sq.ft./year)	30	28.75	37.88	23	29.9075
11	Percentage of people who consider the same area to be the best to live in the city	90	85	40	55	67.5
	Percentage of people who consider some other area to be the best to live in the city	10	15	60	45	32.5
12	Percentage of people who availed loans for making the house	30	45	40	30	36.25
	Most prominent financing agency	HDFC, SBI	HDFC, SBI, ICICI	Departmental, HDFC, banks	SBI, HDFC, Departmental	Bank, ICICI, HDFC, Departmental
	Major factor in governing house location	Land value	Transportational linkage	Land value	Land value	Land value
13	Second major factor in governing house location	Proximity to workplace	Land value	Transportational linkage	Good social environment	Transportational linkage
	Third major factor in governing house location	Good social environment	Proximity to workplace	Good social environment	Transportational linkage	Good social environment
14	Average power supply hours	21.75	22	21.05	22.65	21.8625
	Percentage of people who complained voltage fluctuations	65	55	75	45	60
	Average distance of nearest tempo stand	1.49	1.43	1.8	1.25	1.4925
15	Average distance of nearest bus stand	1.63	1.63	5.25	4.5	3.2525
	Average distance of nearest MRTS station	5.9	3.62	3.85	8	5.3425
	Average distance of nearest petrol	2.15	1.23	1.65	1.25	1.57
	Openion about the public transportation facilities (percentage distribution)					
16	Good	20	40	15	0	18.75
	Bad	15	10	40	65	32.5
	Satisfactory	65	50	45	35	48.75
17a	Average distance of nearest medical facility	0.61	1.77	1.75	1.15	1.32

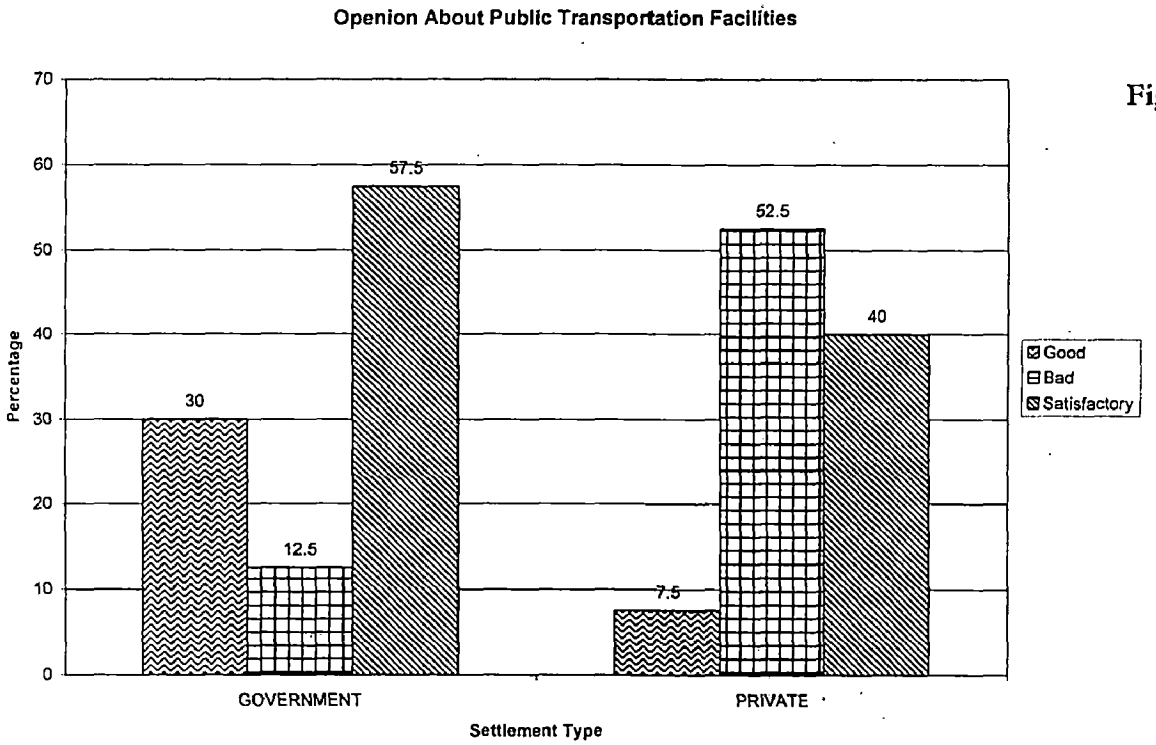


Figure 4.61

- In G one third of the population has graded it to be good as against only 7.5% in P.
- In P 52.5% population has termed it bad as against 12.5% in G.
- Majority has termed it satisfactory in G and bad in P.

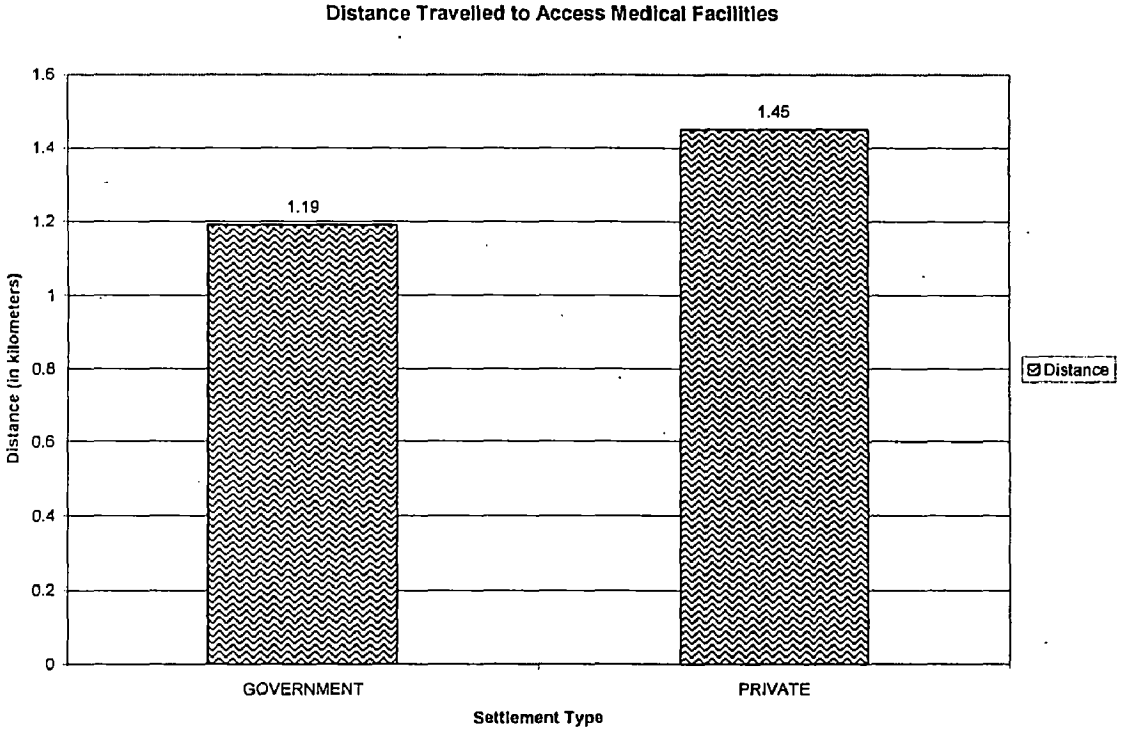


Figure 4.62

- One has to travel lesser distance to access medical facility in G as compared to the P areas.
- Average distance is 1.32 kms.

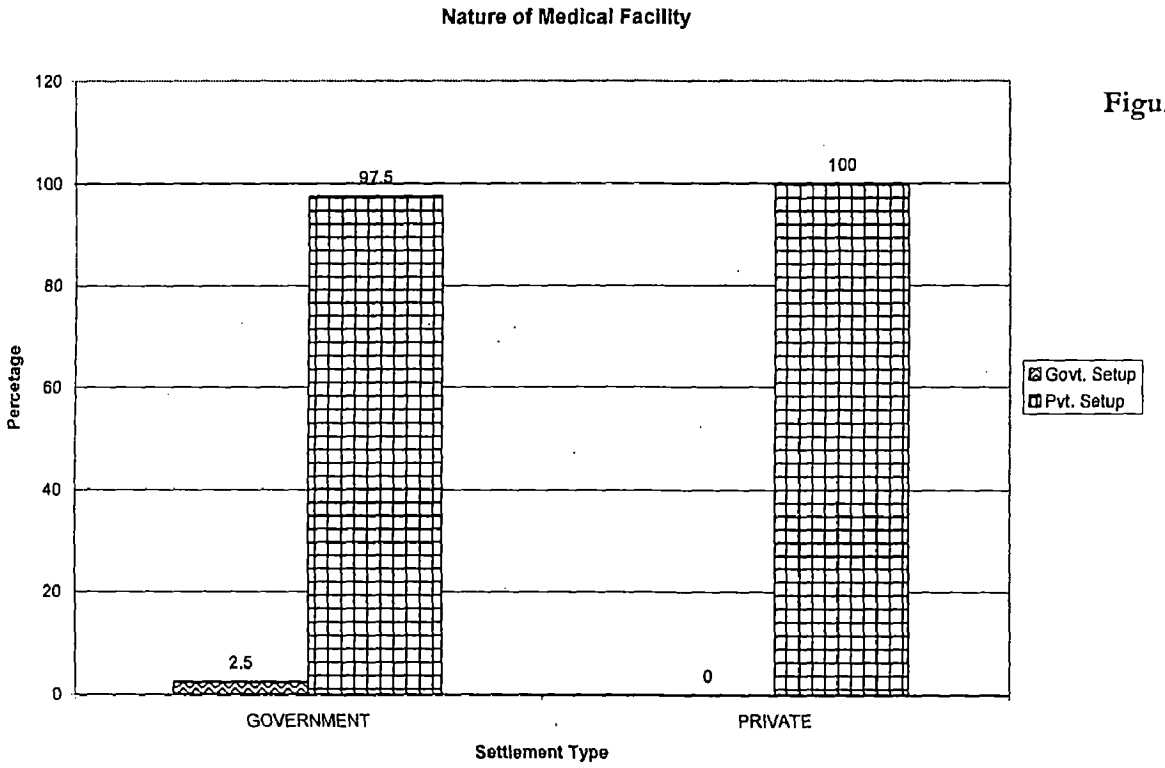


Figure 4.63

- The number of government setups even in the G areas is very low only (2.5% cases) as against 0% in P.
- The service is majorly being provided by the private setups in both areas (on an average 98.75% cases).

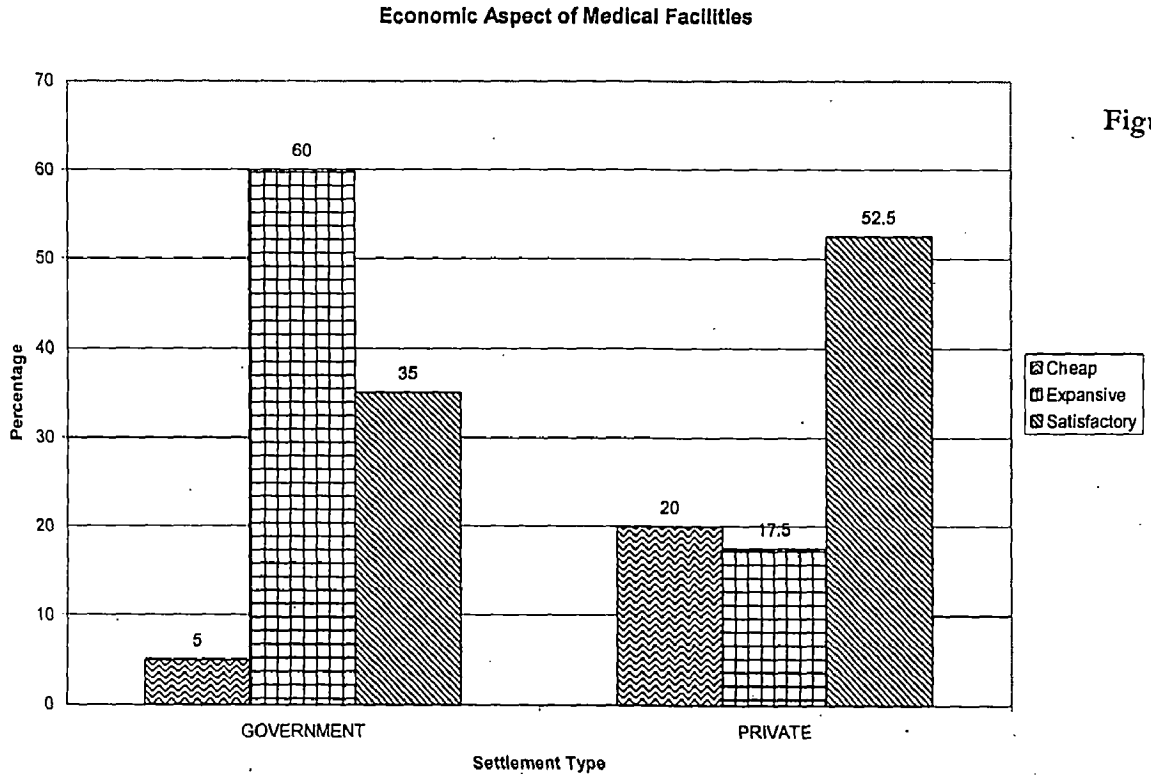


Figure 4.64

- Cheap medical facilities are more readily available in P areas.
- In G areas these are expansive generally (as reported by more than half of the respondents).
- In P areas half the people have graded it to be satisfactory.

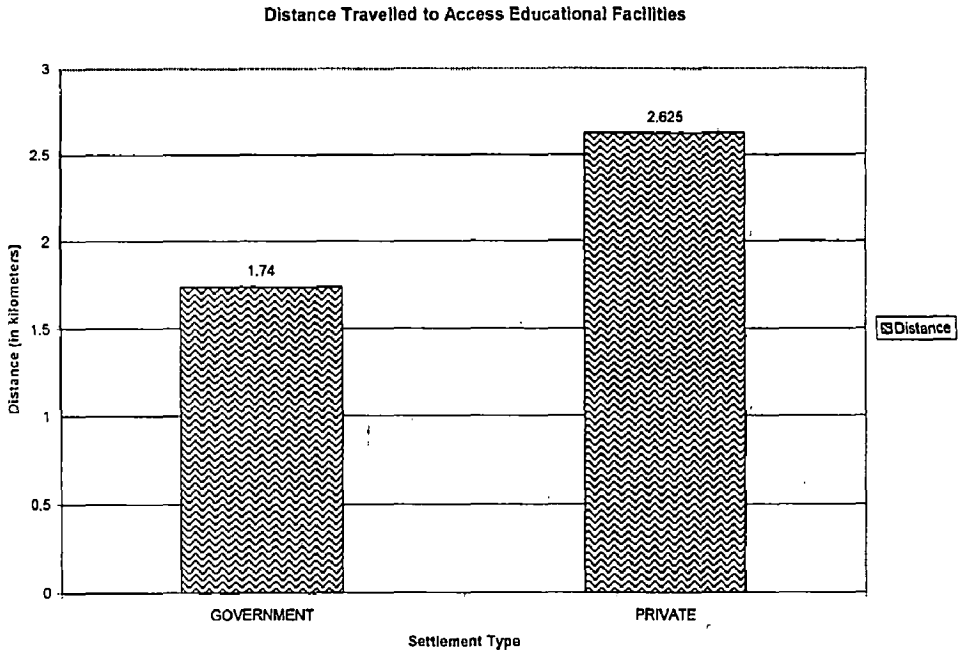


Figure 4.65

- Lesser distance is traveled in case of P settlements.
- The average distance traveled is 2.18 kms.

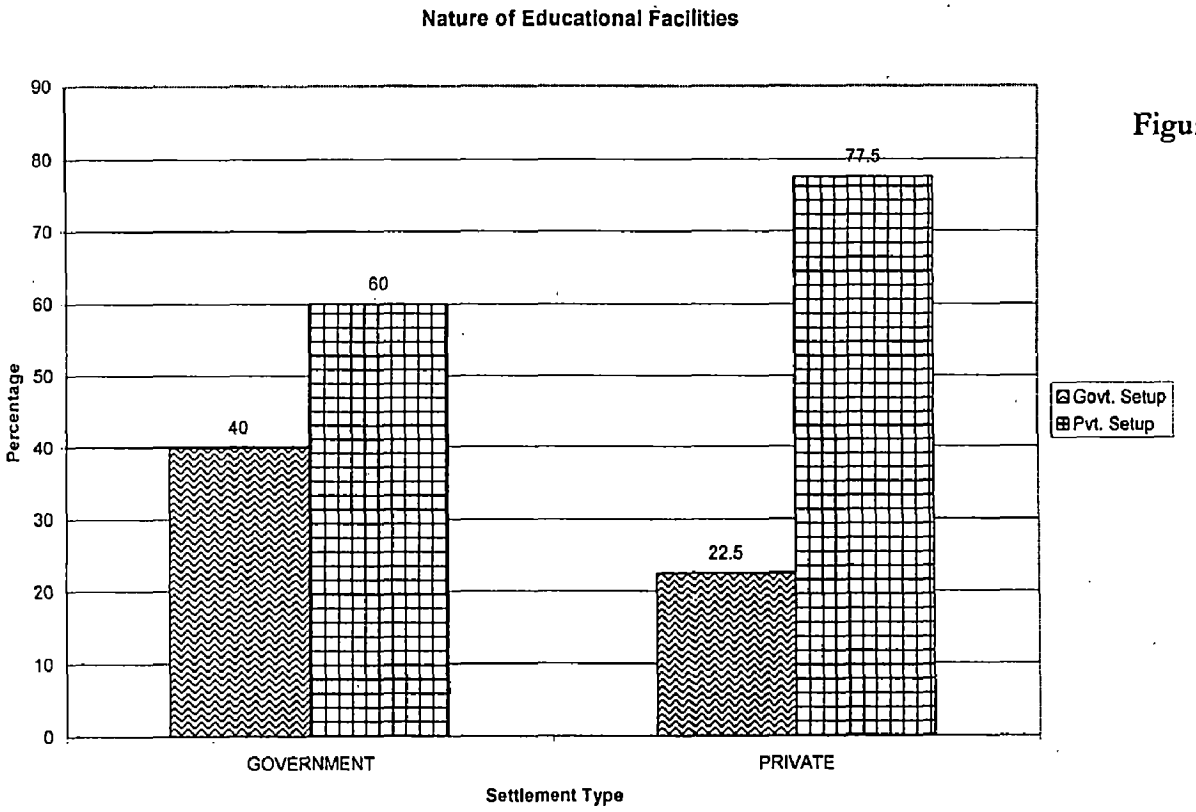


Figure 4.66

- In both areas the fraction of private setups are greater (on an average 68.75% cases).
- In G areas the government setups are comparatively higher as against P areas.

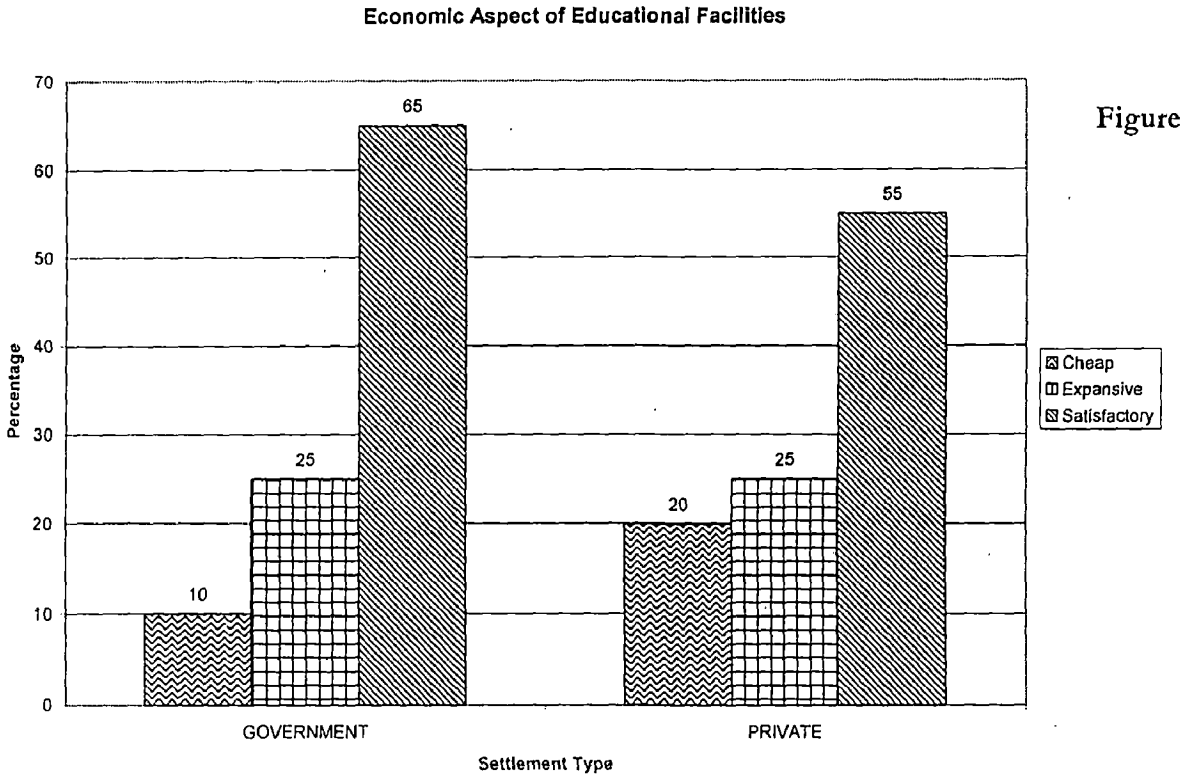


Figure 4.67

- Cheap educational facilities are more readily available in the P areas as compared to the G areas.
- Larger fraction has termed them to be satisfactory. In G areas.

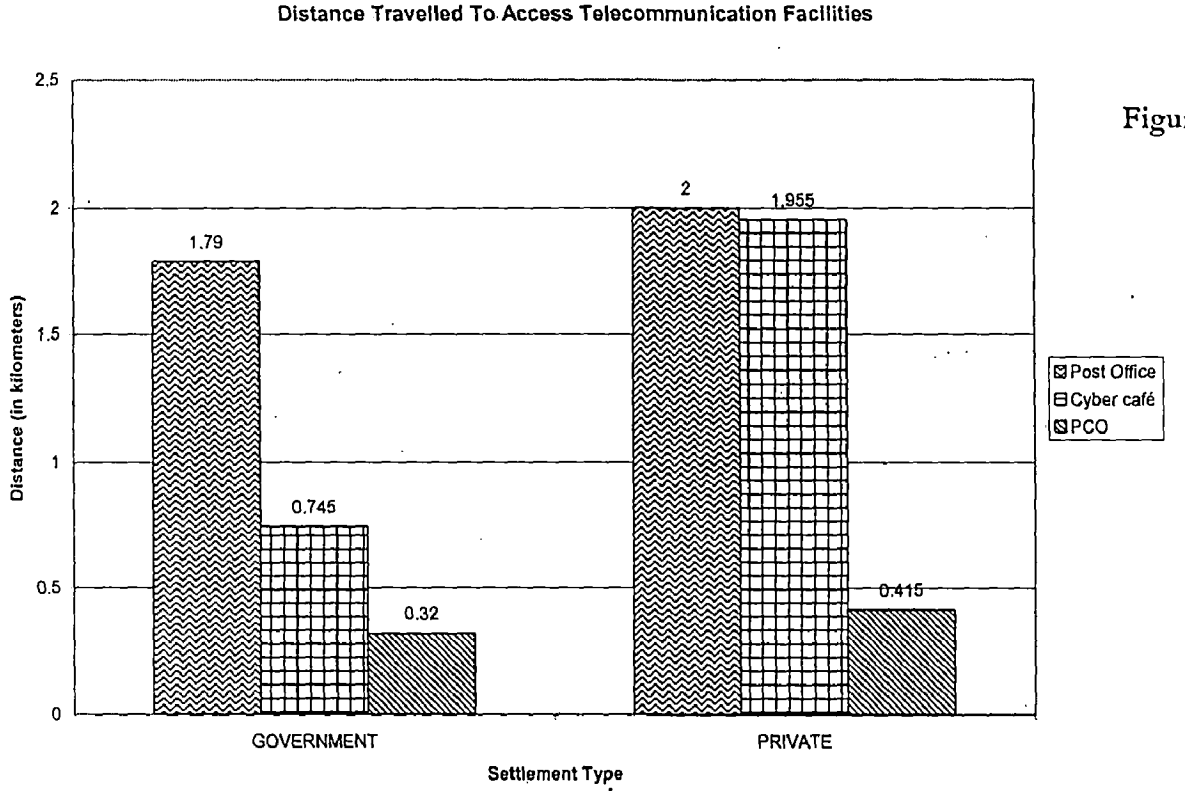


Figure 4.68

- Facilities like P.C.O., cyber café and post offices are more easily available in G areas than in P areas.

- The average distances traveled to access the nearest of them being, 0.36, 1.35 and 1.89 kilometers respectively.

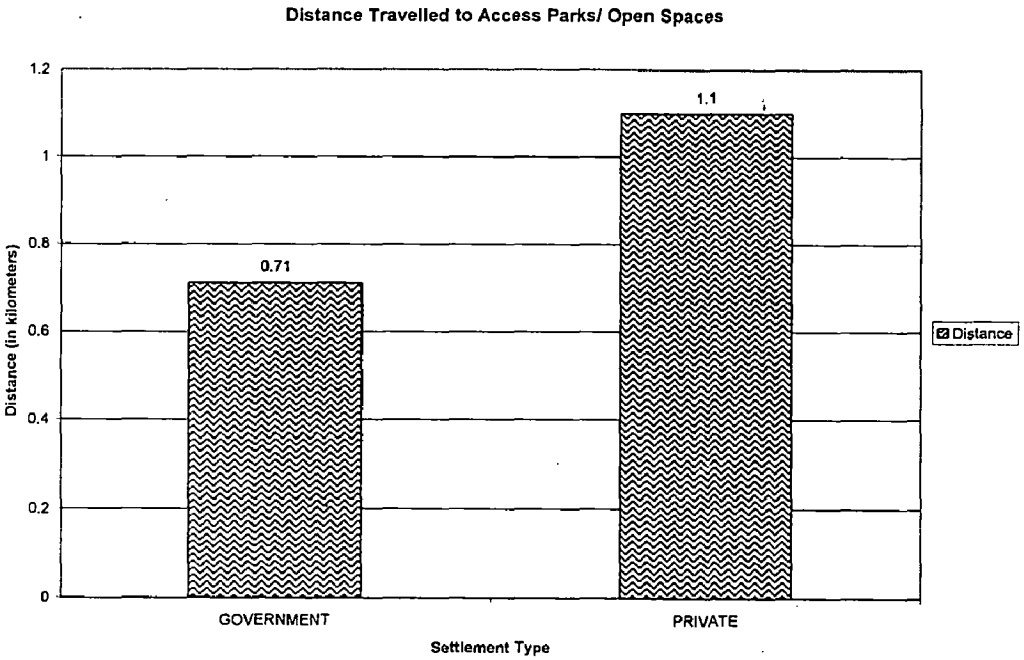


Figure 4.69

- Parks and open spaces are nearer in G areas (average 0.7 kms.) as against 1.1 kms. in P areas.
- The overall average distance traveled to access nearest park / open space is 1.90 kms.

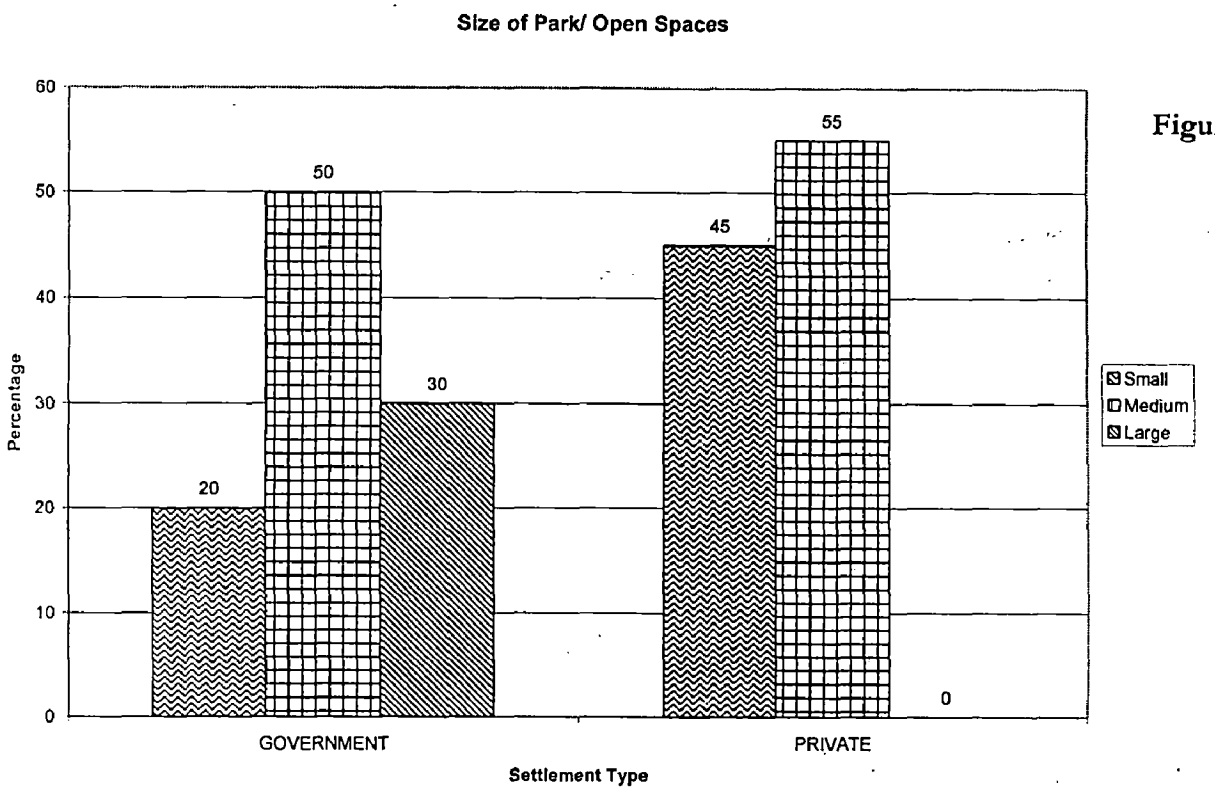


Figure 4.70

- Generally medium sized parks are available in both the areas G and P.

- Larger parks are available in the G areas only, as against P areas wherein only small and medium sized ones are available.

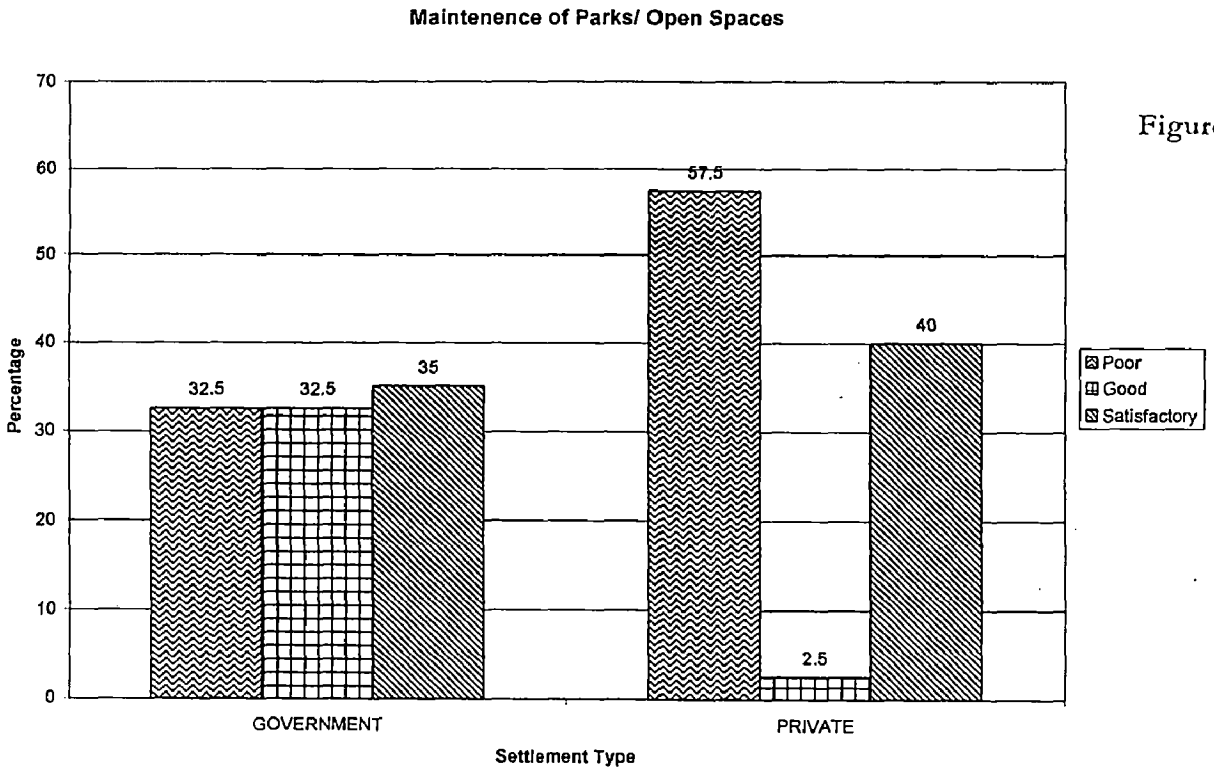


Figure 4.71

- Maintenance has been found to be better in G areas as against the P areas wherein majority has termed it to be poor.

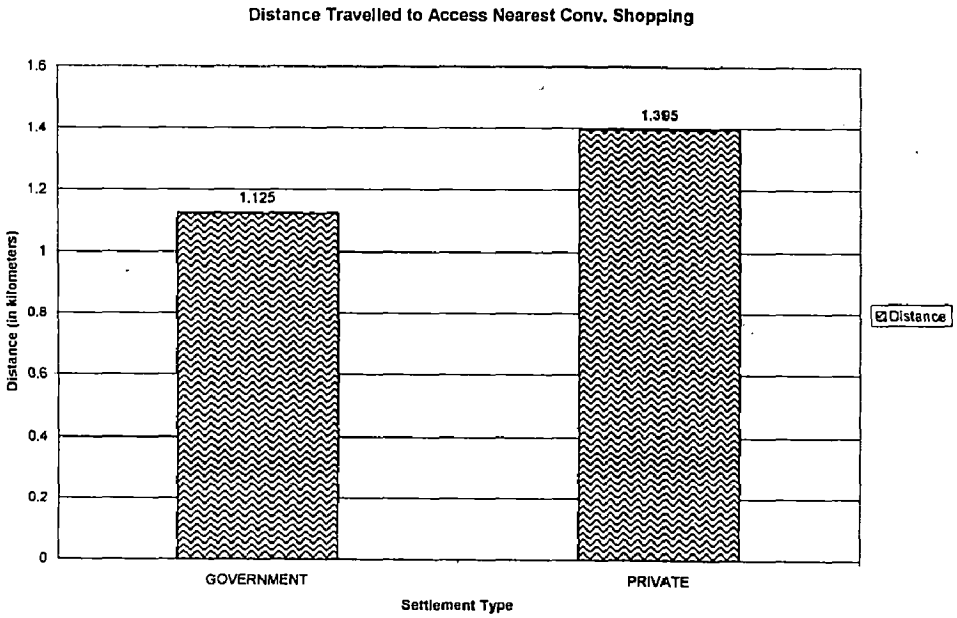


Figure 4.72

- They have been found to be nearer in G.
- Average distance of the nearest convenient shopping center is 1.26 kms.

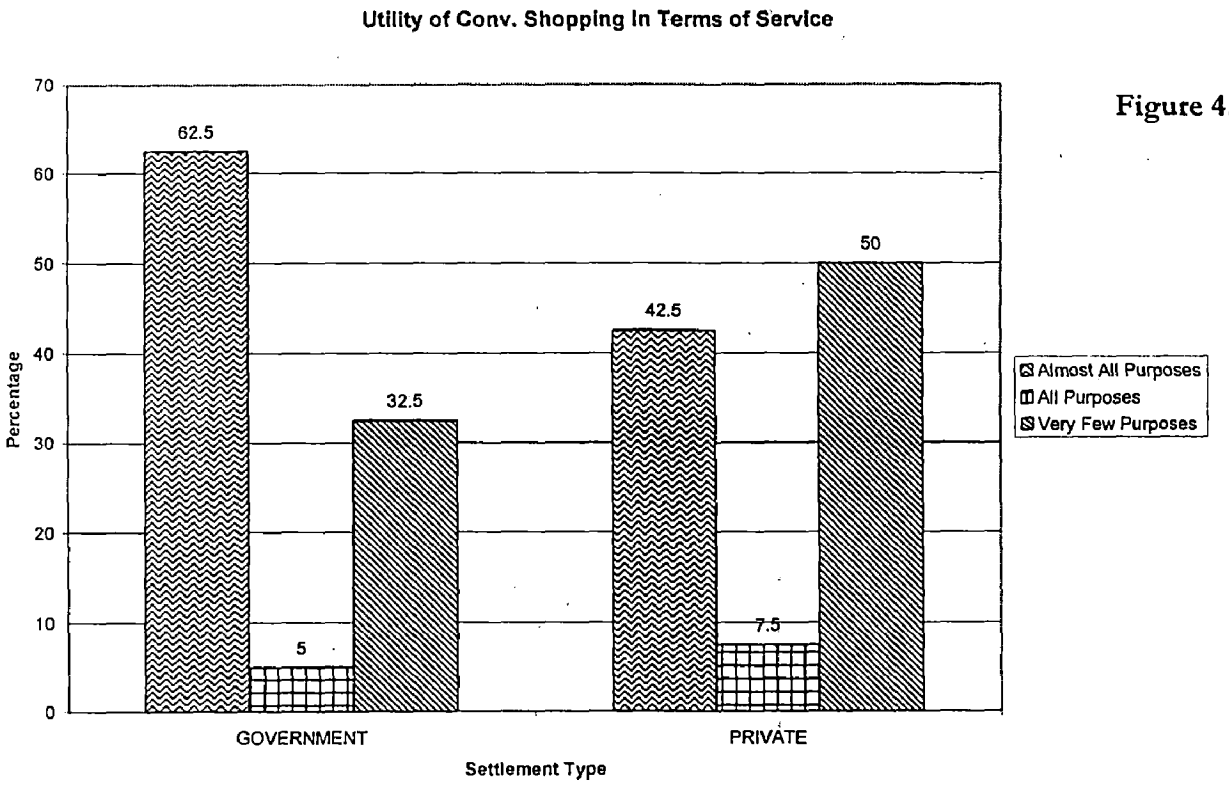


Figure 4.73

- Convenient shopping centers in the G areas have proved to be better in fulfilling the local needs (i.e. more purposeful).
- In P areas, more people have termed them to be useful for very few purposes.

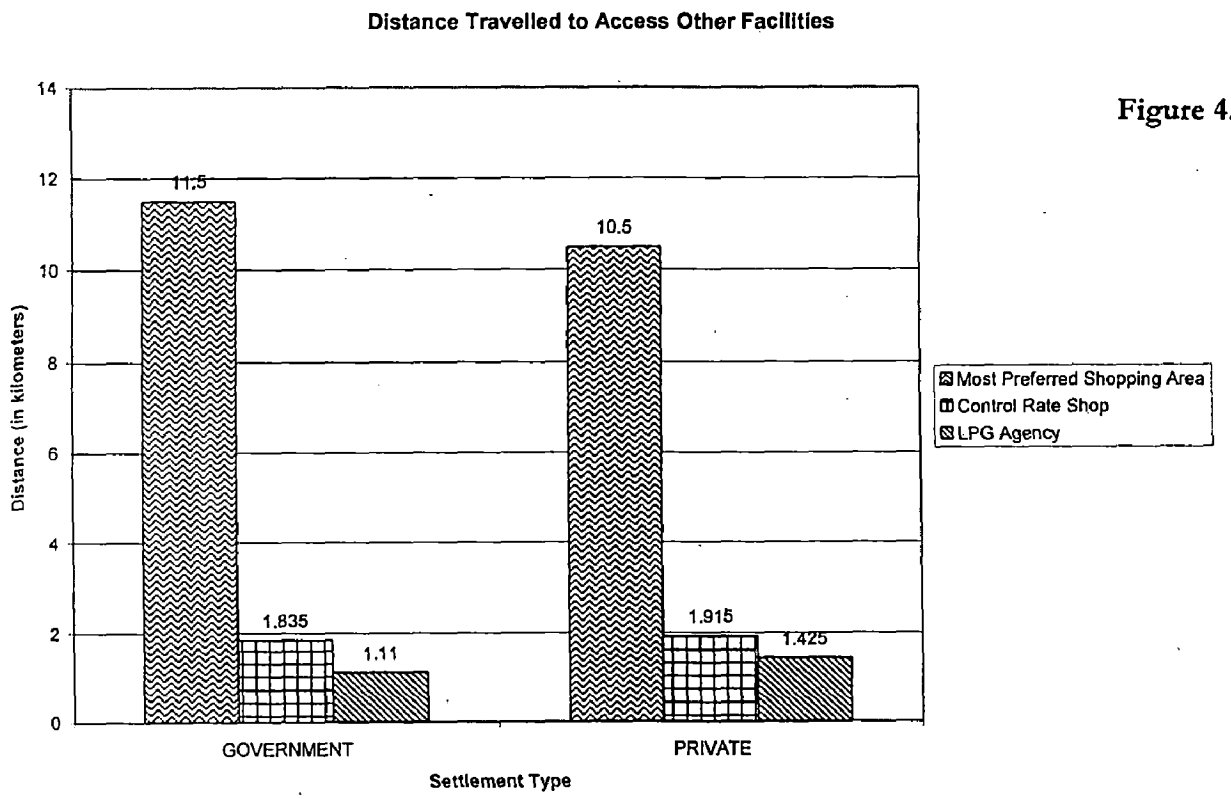


Figure 4.74

- Most preferred shopping areas are on an average 11 kms apart but are comparatively nearer for P areas.
- Control rate shop and L.P.G. agencies are nearer for people living in G areas.
- On an average they are 1.87 and 1.26 kms away respectively.

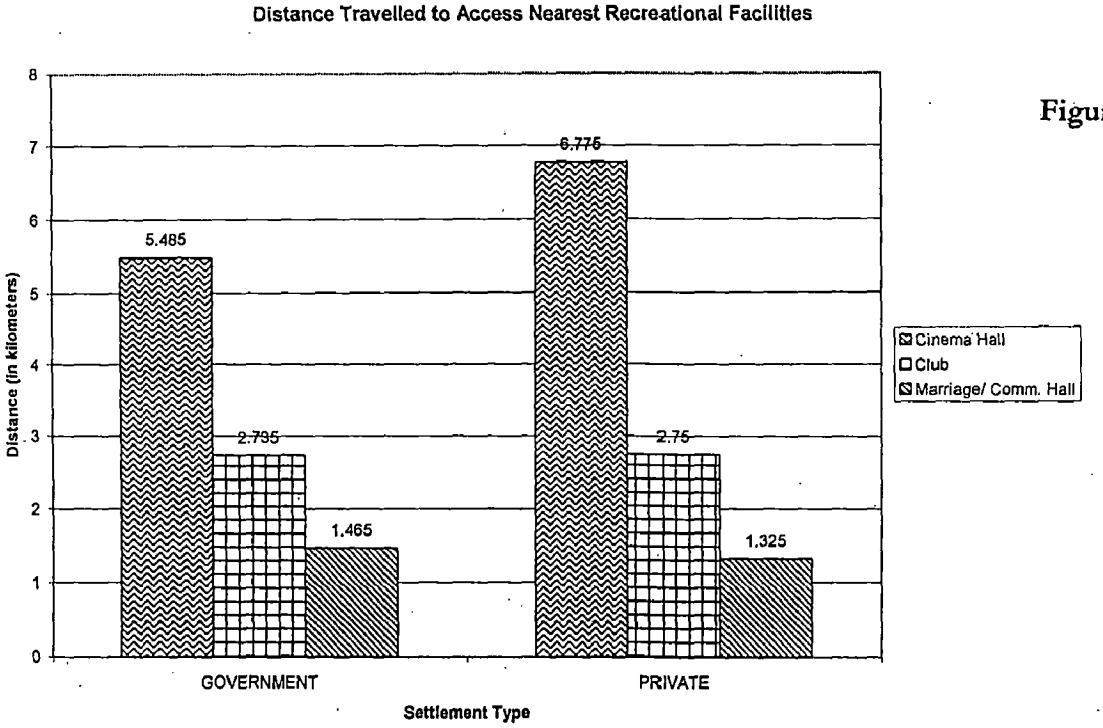


Figure 4.75

- Cinema halls are far away in general but are relatively nearer to the G areas (average distance being, 6.13 kms.)
- Clubs and marriage halls are at average distances of 2.74 kms. and 1.39 kms. respectively.

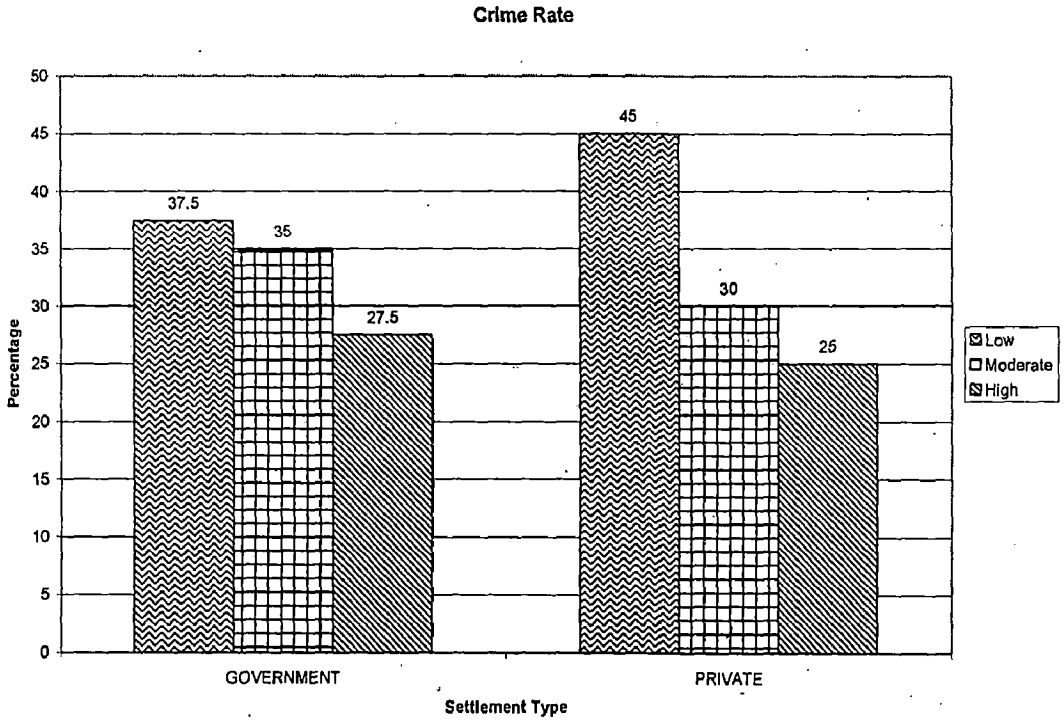


Figure 4.76

- Crime rates have been found to be higher in the G areas, comparatively.
- Almost half the respondents have quoted the rates to be low in the P areas.

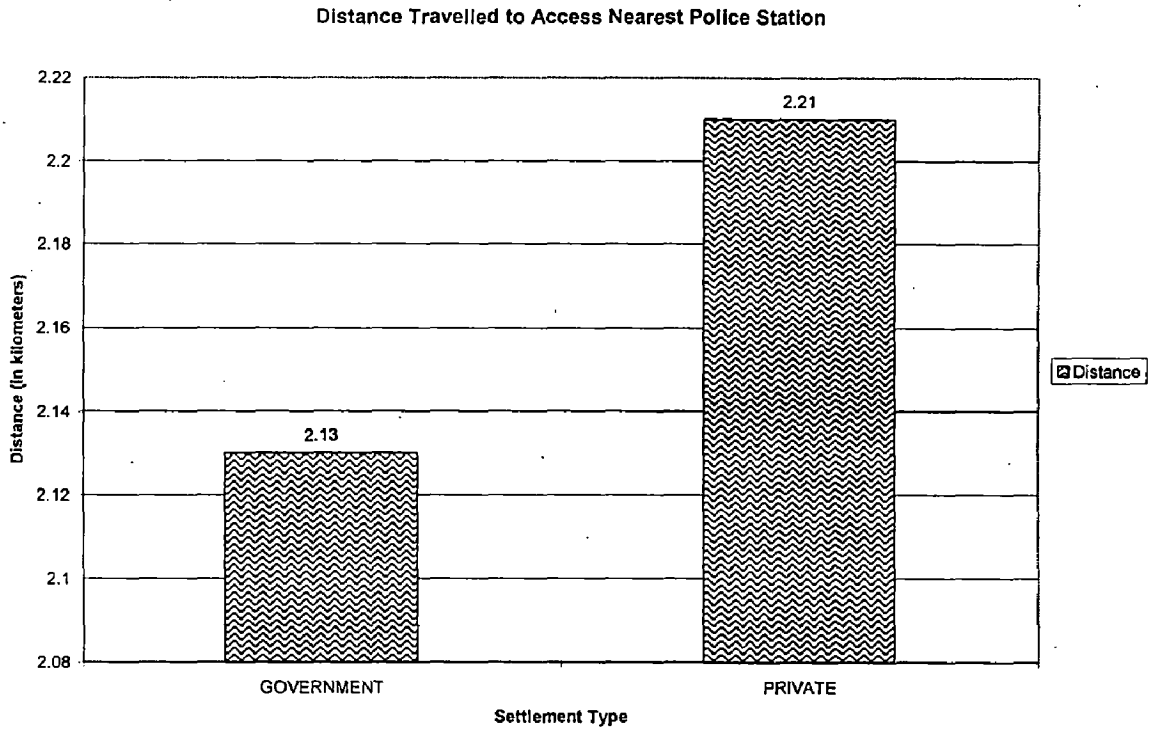


Figure 4.77

- Police stations have been found to be comparatively nearer in the G areas.
- The average overall distance being, 2.17 kms.

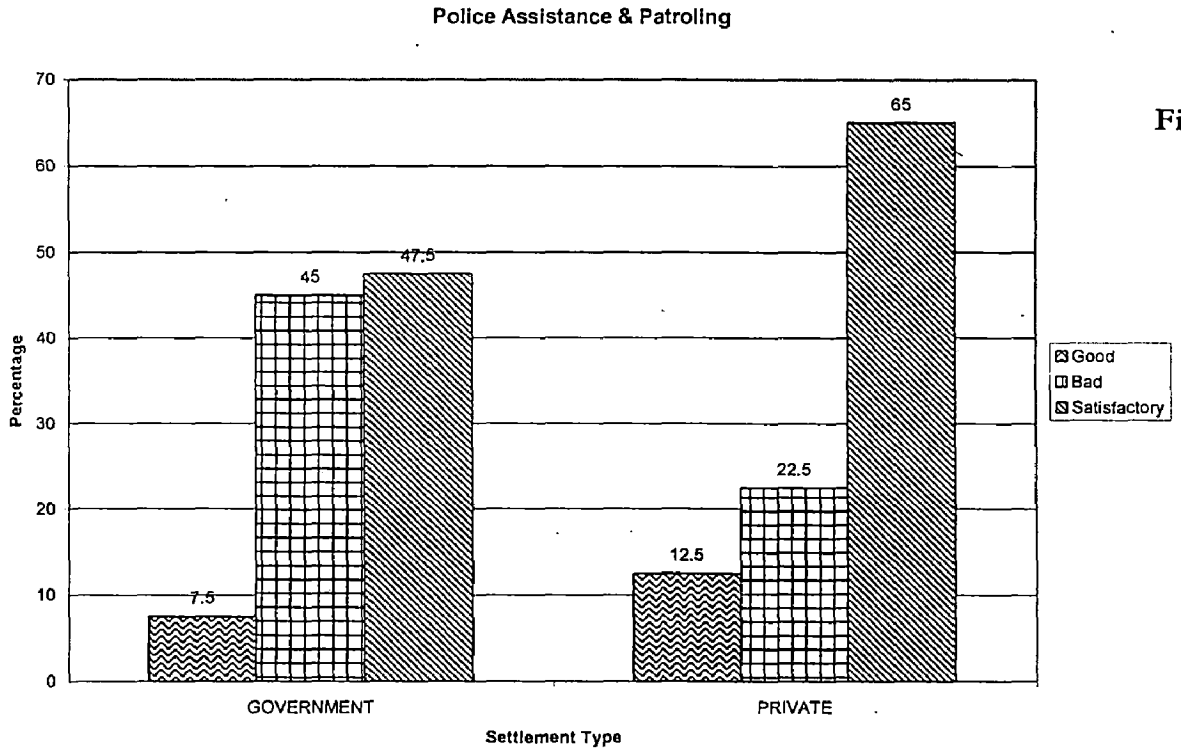


Figure 4.78

- This is found to be better in the P areas.
- In G areas almost half of the people have termed it to be bad.
- In P areas 65% of the respondents have been found to be satisfied.

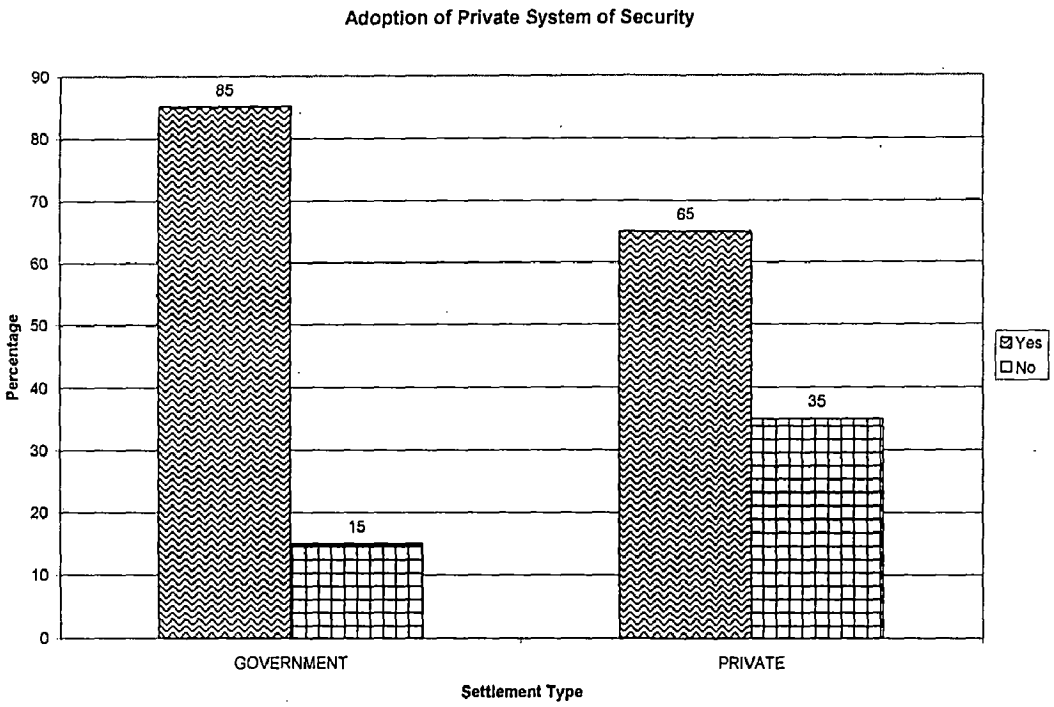


Figure 4.79

- In G areas larger fraction of the population relies on private system of security (85%), as against 65% in the P areas.
- On an average 75% of households have adopted private systems, like private guards, alarming systems etc.

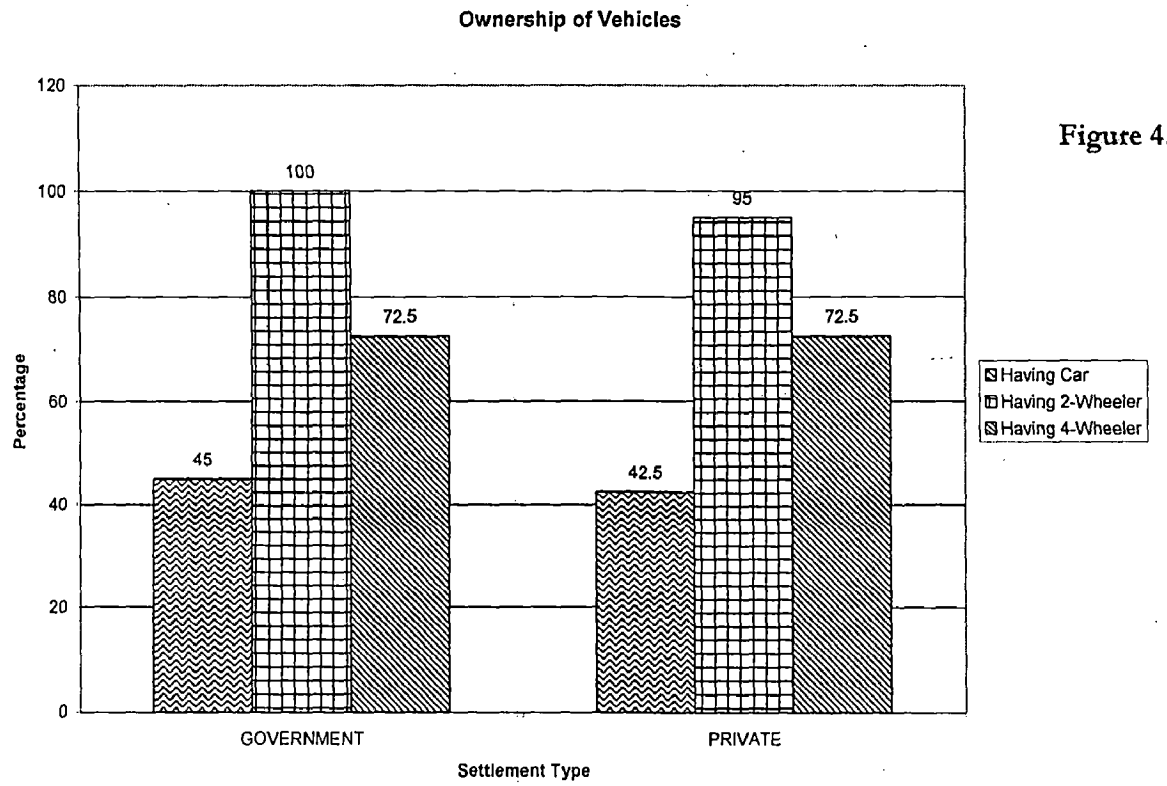


Figure 4.80

- In G areas people have higher vehicular count.
- Almost half the households own a car.

- Almost all the households own a 2 wheeler.
- Almost three fourth of the households own a bicycle.

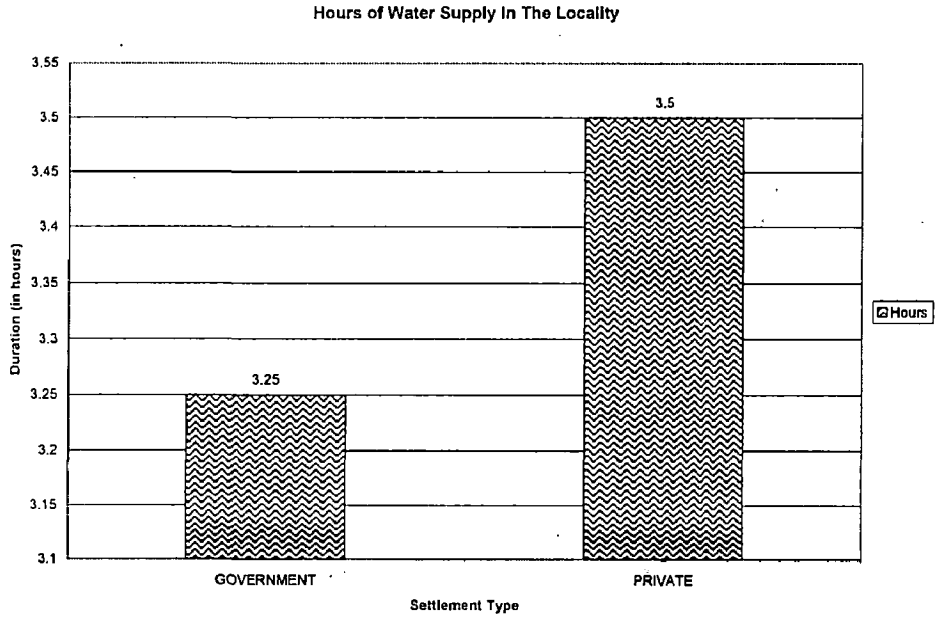


Figure 4.81

- More supply hours in P as compared to the G areas.
- Average supply hours being, 3.37 hrs.

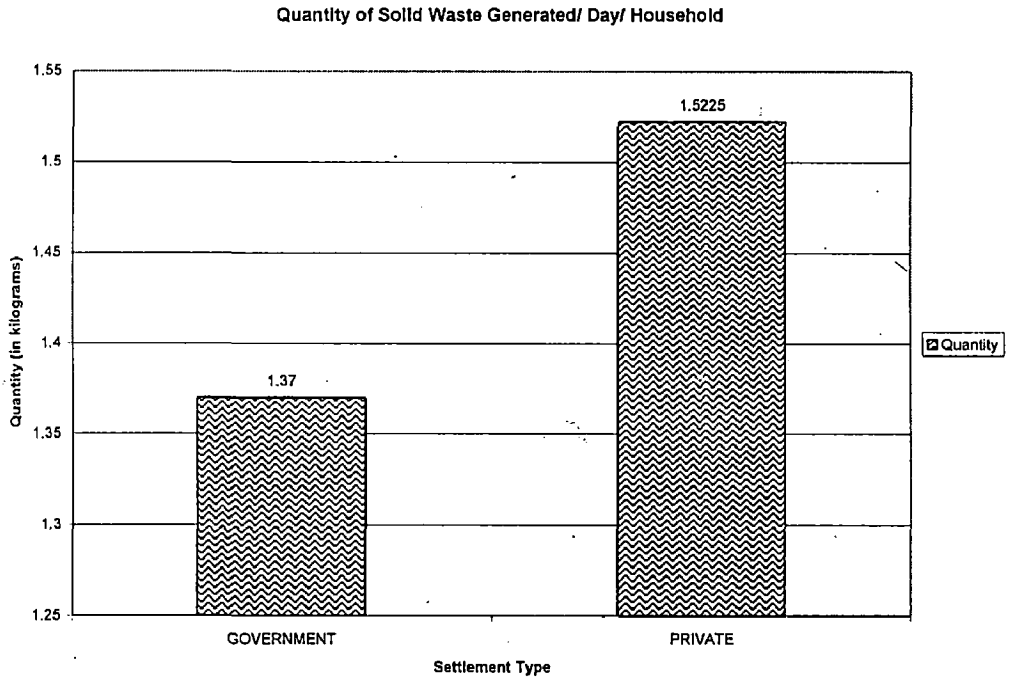


Figure 4.82

- Greater amount of solid waste is being generated in the P settlements as compared to those of G areas.
- On an average 1.44 kgs. of waste is being generated per day per household.

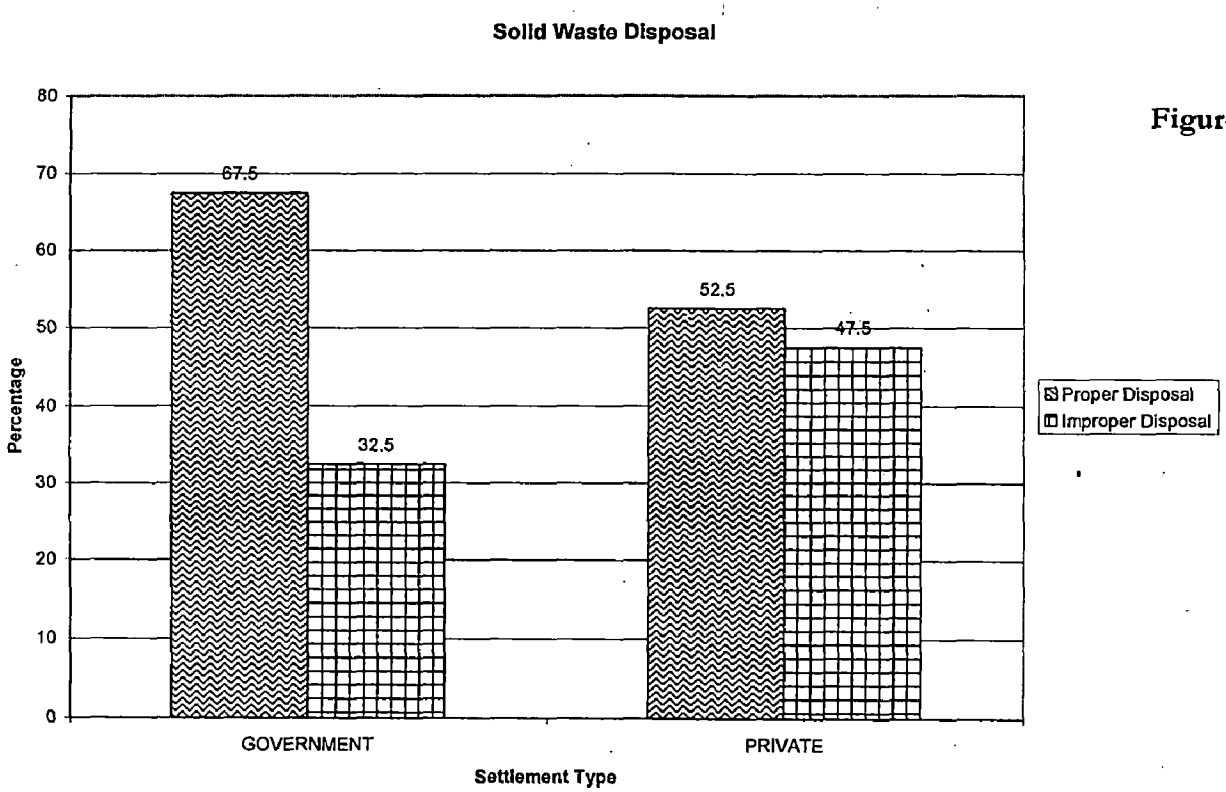


Figure 4.83

- Better disposal in the G areas than P.
- On an average in 60% cases, proper disposal from households has been observed.

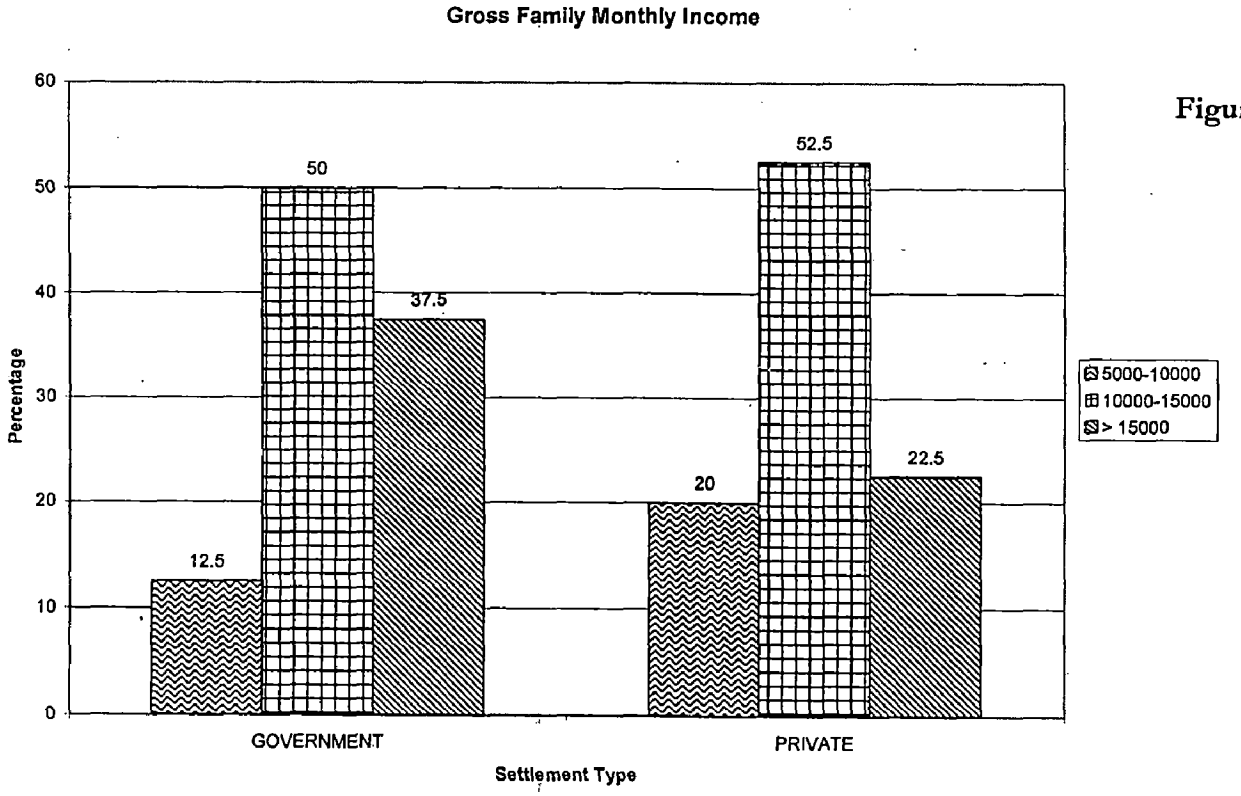


Figure 4.84

- In both the areas mostly people belong to the middle income group.

- Higher income group people have a larger fraction in the G areas as compared to the P, where low and high income groups are almost equal in strength.

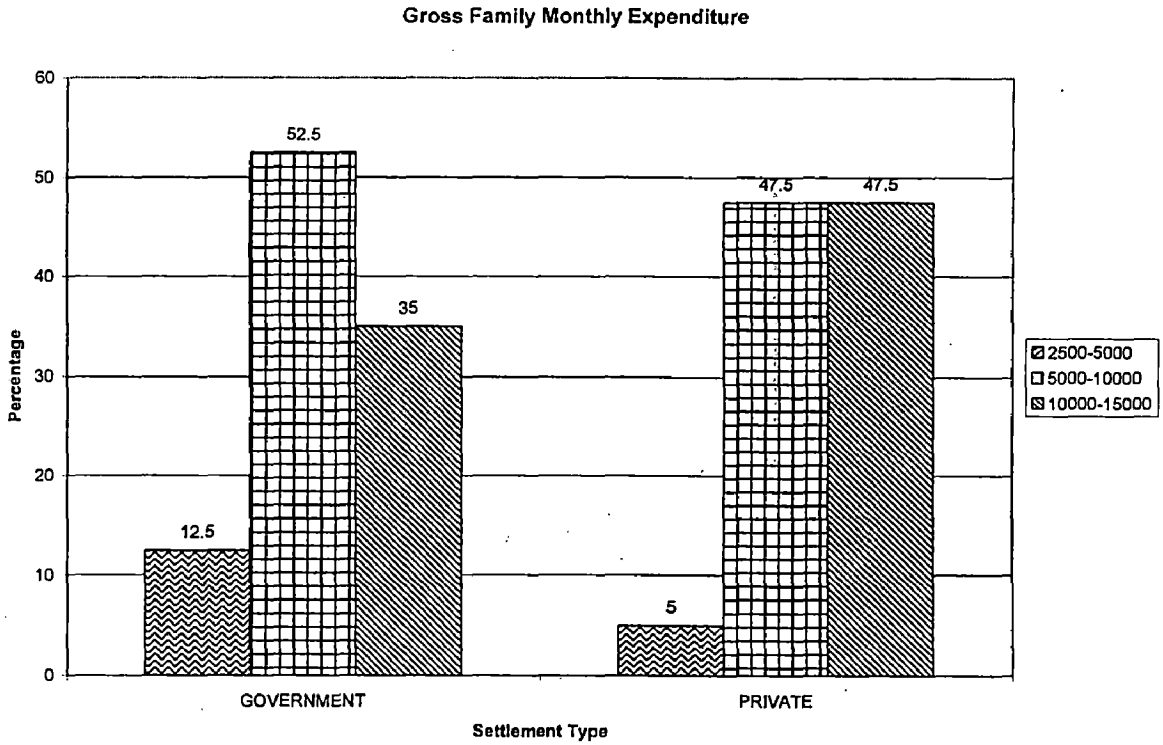


Figure 4.85

- In G areas, the fraction of people having low expenditure is higher.
- In G areas, majority of the people have a mid range of expenditure, whereas in the P areas, there is an equal strength of mid and high range expenditure.

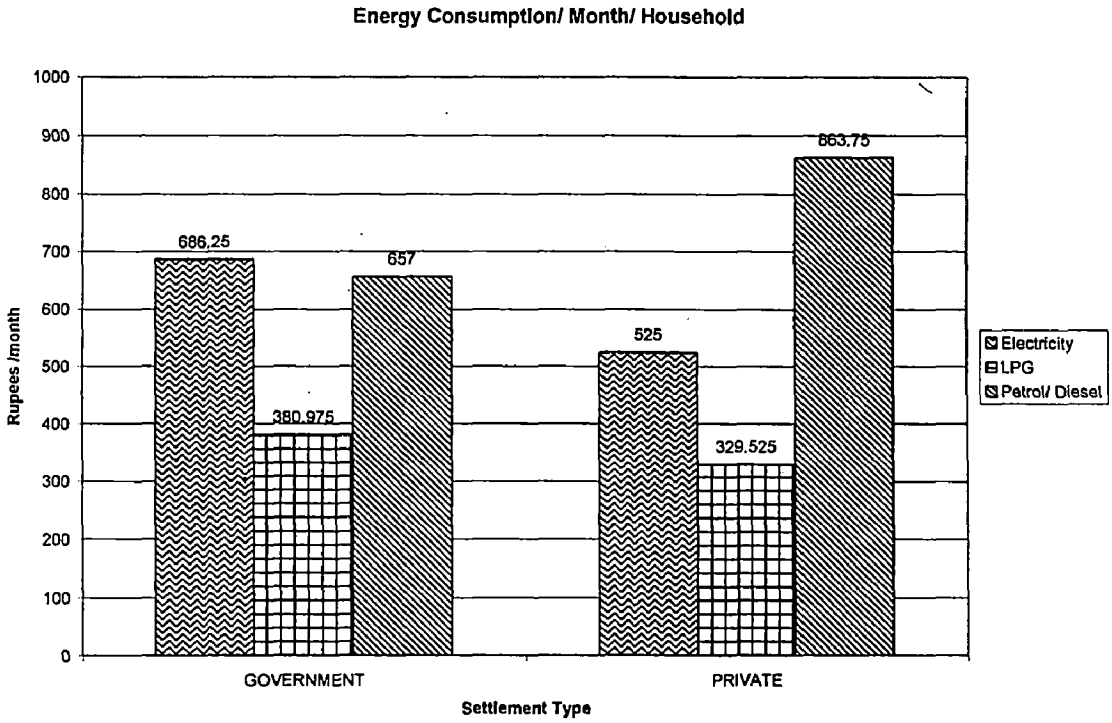


Figure 4.86

- In G areas people are spending more for electricity and LPG, while people in P are spending more against petrol and diesel.

- On an average, the people living in the G areas are spending more on energy than those in P areas.

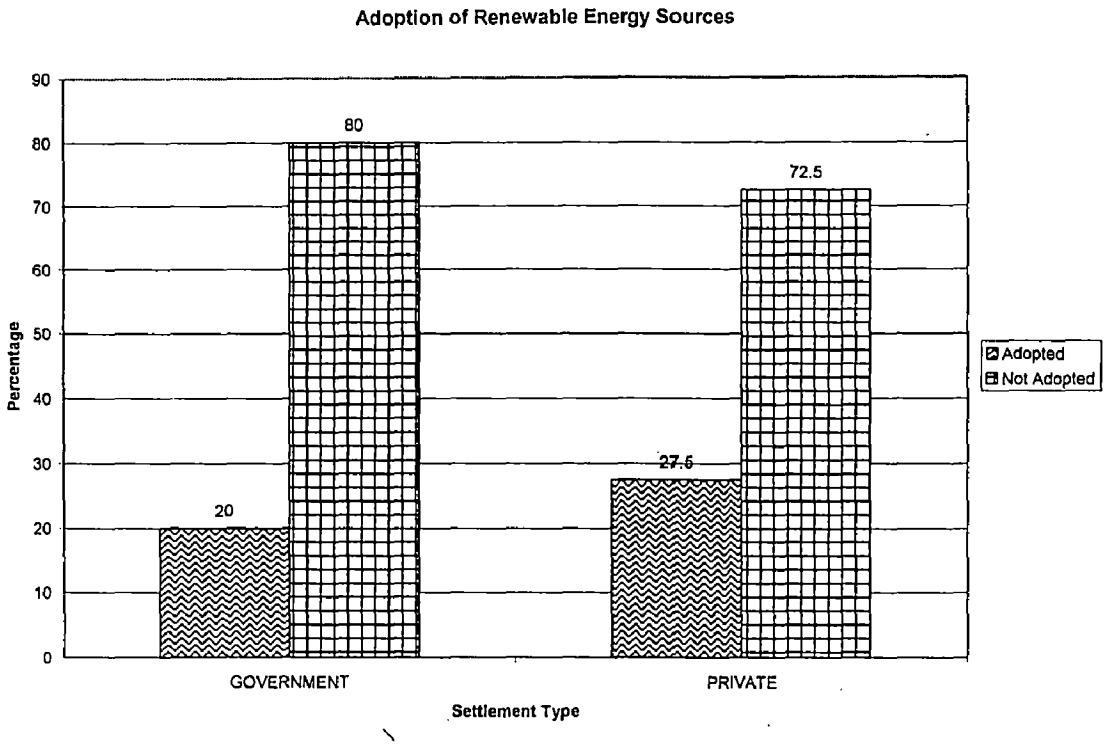


Figure 4.87

- Higher fraction of the people in P have adopted the renewable sources of energy as against the G areas wherein lesser fraction has adopted.
- On an average, 23.75% of households have adopted these sources.

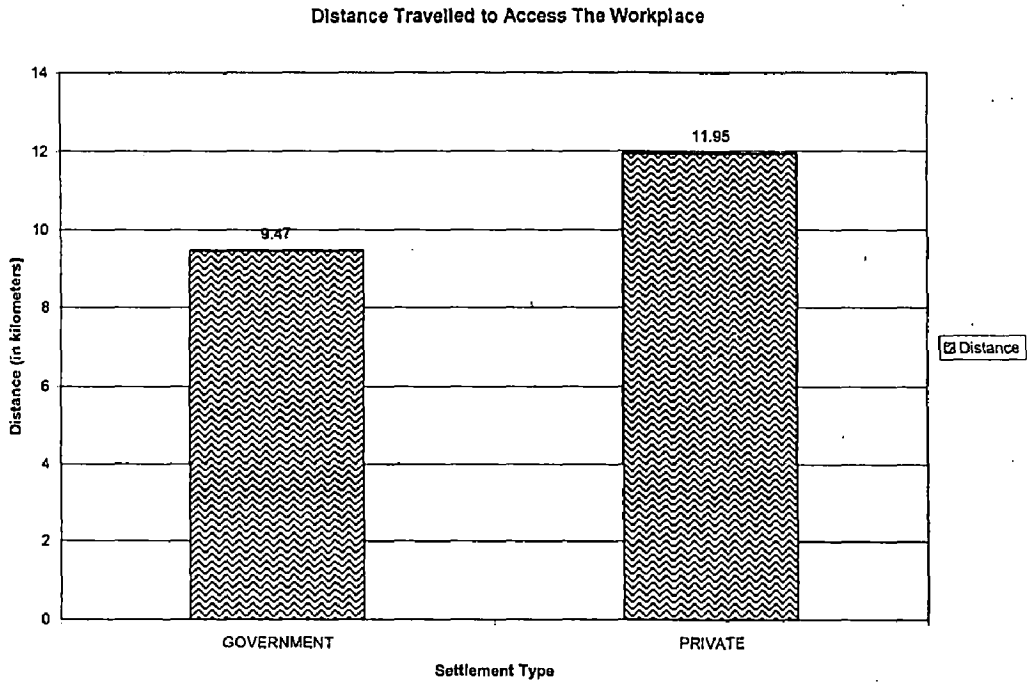


Figure 4.88

- People living in P areas, are traveling larger distances to reach their workplaces.
- On an average, people are traveling 10.71 kms. to reach their workplaces.

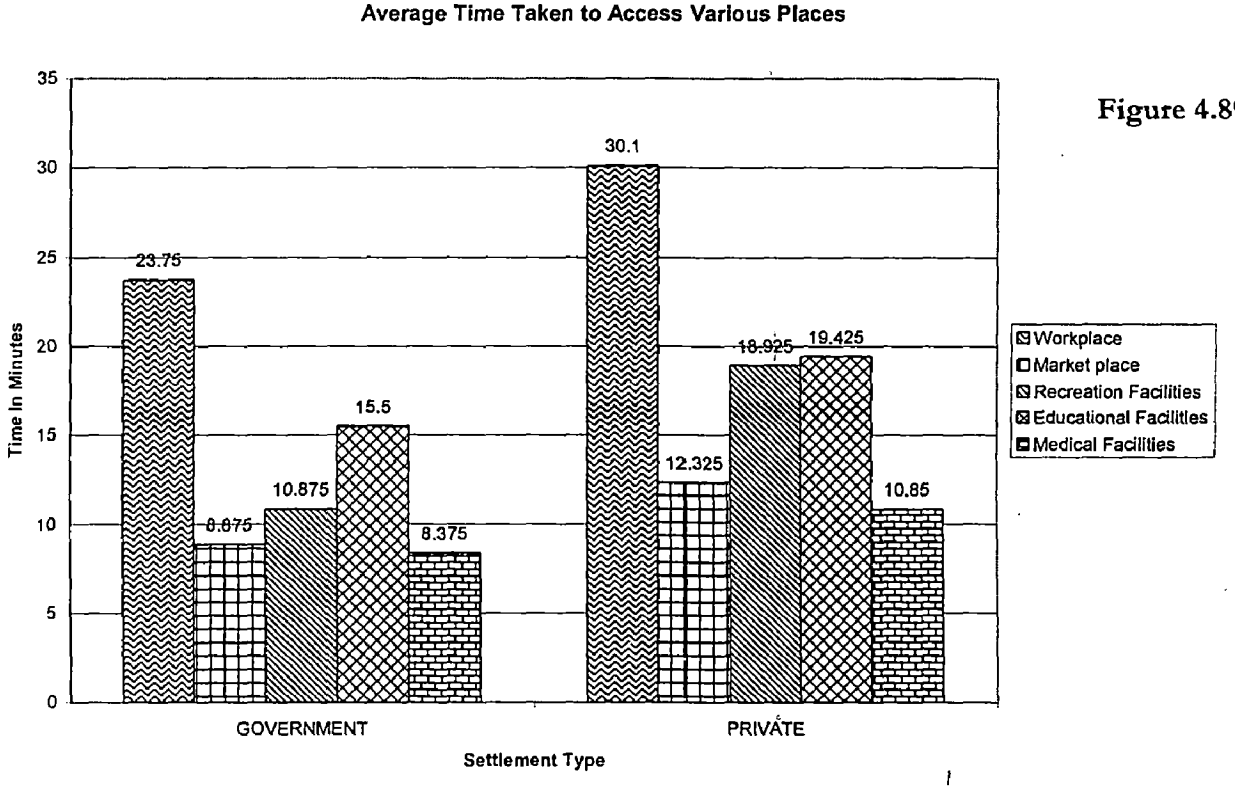


Figure 4.89

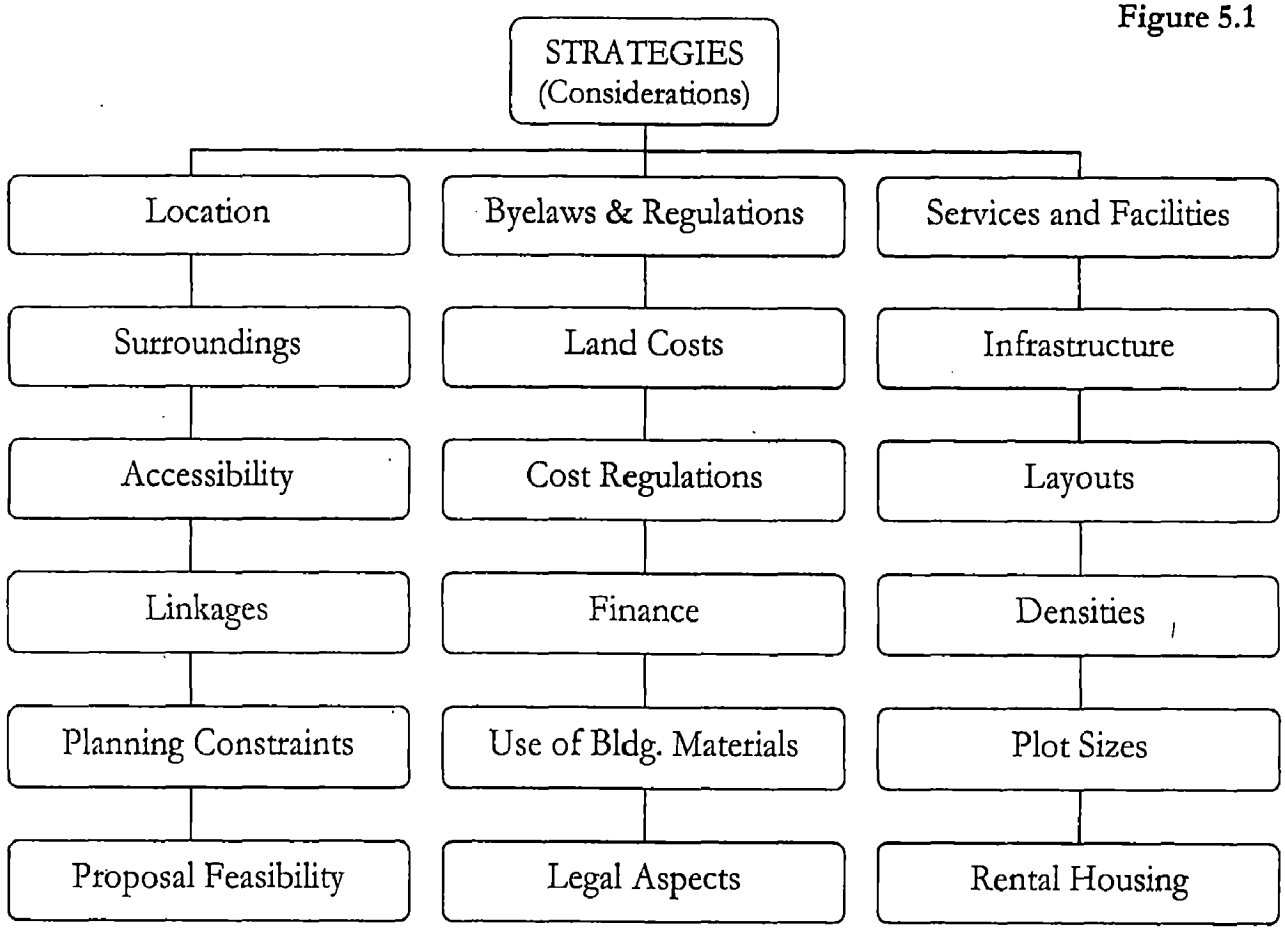
- People in P areas take more time in reaching to all destinations.
- Average time taken to reach to workplace – 26.93 minutes.
- Average time taken to reach to marketplace – 10.60 minutes.
- Average time taken to reach to recreational facilities – 14.90 minutes.
- Average time taken to reach to educational facilities – 17.46 minutes.
- Average time taken to reach to medical facilities – 09.61 minutes.

Chapter 5.

INFERENCES AND FINDINGS:

5.1 Factors affecting the strategies:

Figure 5.1



Above mentioned are the various factors governing the strategies and methods adopted during the development of a new residential area. In this settlement process, there are broadly two entities which play important role, the consumer (residents) and the supplier (the government agencies and the private bodies involved in planning and construction). Not all the factors are of concern to all the entities, so they can be categorized into three groups with respect to the concern of the three.

5.2 Categorization of the concerns of housing consumer and supplier:

Depending on the concern of the consumer, government bodies and the private agencies, the various factors governing the settlement of a new residential area can be correlated. The following table presents the same wherein √s show a positive concern.

Table 5.1 Correlation of concerns of housing consumer and supplier.

S.No.	Factor	Consumer	Govt. Bodies	Pvt. Agencies
1	Location	√	√	√
2	Accessibility	√	√	√
3	Surroundings	√		
4	Land costs	√	√	√
5	Finance options	√	√	√
6	Services & facilities	√	√	
7	Proximity to workplace	√		
8	Planning constraints		√	√
9	Feasibility		√	√
10	Byelaws & standards		√	
11	Building materials/ techniques		√	√
12	Legal aspects		√	√
13	Cost of infrastructure		√	
14	Layout		√	
15	Density		√	√
16	Plot sizes	√	√	√
17	Rental housing	√	√	√
18	Communication links	√	√	

Thus the adoptive strategy is the one which takes into account all the above mentioned factors so as to make the scheme more comprehensive, diverse and widely accepted.

5.3 Average Land use pattern & comparison to standards:

The average of the land uses of the four residential areas studied has been calculated and has been compared to the standards laid by the authorities. This has clearly revealed the non implementation of the rules and regulations.

Table 5.1 Comparative land use distribution.

S. No.	Land use	Average (%)	Standard (%) [8]
1	Residential	63.60	55-60
2	Commercial	13.30	25-22
3	Green / open spaces		
4	Educational		
5	Facilities and services		
6	Roads and circulation	23.10	20-18
	Total	**100.00**	**100.00**

Inferences:

1. The area under residences in general overshoots the standards specified by the U.P. Housing Board.
2. The area under facilities and services has been observed to be much less than that specified in the standards.
3. The area under roads and circulation has also exceeded the standards.
4. In general there is a lesser concern for the provision of the required facilities and amenities in the residential areas, no matter they are developed by the government authorities or by the private developers.

5.4 Major Findings from Survey Data Analysis and Observations:

The major findings and inferences drawn from the survey data and analysis have been categorized under various headings as follows:

5.4.1 Housing type, services & facilities:

1. Survey data analysis has revealed that almost 70% (three fourth) of the houses are single storied. This has led to rapid horizontal expansion of the city.
2. Majority of people are having their own houses (about three fourth) and about one fourth of them have availed finance/ loans for housing construction. The lower income groups have been found to avail loans less often.

3. Electricity supply, water supply, medical facilities, parks/ open spaces etc have been found to be better in government supported areas, except for the educational facilities which are more readily available in the areas promoted by private agencies. Medical and educational facilities are majorly being provided by the private firms. This leads to expansive service and lack of standards but on the other hand, it offers business and employment opportunities.

4. Telecommunication facilities (like, P.C.O., post office and cyber café), are more readily available in the government promoted areas. On an average they can be termed as satisfactory. Several individuals have found it to be a profitable business and thus their coverage has become wide. But the number of post boxes has been found to be insufficient in both types of localities.

5. The crime rates have been found to be higher in the government supported areas (due to the class of people living in there), in spite of the fact that police patrolling has been found to be better in these areas. This is also evident from the fact that almost 85% of the residents from government supported localities have adopted private security systems like alarm systems or private guards.

5.4.2 Financial aspects:

1. It has been observed that the land prices and the rate of increment in the government supported areas have always been higher. In addition, the surrounding/ nearby areas also tend to show higher prices in spite of lagging services and facilities, which is an outcome of the rapid expansion rate.
2. The city has a greater fraction of service class due to its administrative, educational and political character. The service class has been observed to be availing the financial aid/ loans more frequently, due to the regular income flow. This too is confined to the upper and middle income classes.
3. The majority of people belong to the middle income group. The higher income group has been found to prefer government supported areas and occupy the newly developed areas in early (developing) stages. As regard to the areas developed by the private bodies, the success rates are low at the initial stages.

5.4.3 Regulations:

1. The average plot size of the plots in the residential areas has been found to be 151.52 sq. m. This reflects that lesser number of small plots are available in the residential areas in general.
2. Parks/ open spaces and convenient shopping centers have been found to be better maintained in the government supported areas. In addition the shopping centers in these areas have been found to be more useful in terms of fulfillment of requirements.
3. The most preferred shopping areas of the residents of both the areas have been found to be located at an average distance of 11 kilometers and are generally located in the center of the city. This is basically due to the comparatively low rate of the commodities (because of wholesale nature) and a wide variety of the items available.
4. Majority of people living in areas supported by private agencies, have been found to grade other residential areas better for living than their own, which clearly reflects dissatisfaction and inferior living conditions.

5.4.4 Transportation:

1. The newly introduced MRTS service has been observed to be cumbersome. People don't prefer to use it as the journey is generally split into 3 parts (destination1 to station1, station1 to station2 and finally station2 to destination2). In the present scenario this service is majorly being used by the commuters from the outskirts of the city or nearby localities.
2. Almost all the households have been found to be having a 2 wheeler and almost half of them having a car. This is clear indicative of the fact that people prefer their own mode of transportation as compared to the public transportation system. Although three fourth of the households have been found to own a bicycle but its use is very limited (say for accessing educational facilities by children).
3. People living in areas developed by private developers, have been found to be spending more on fuel (petrol & diesel) implying more distances of work centers, educational and recreational centers, markets etc. meaning thereby bad locational aspect and lack of public transportation facilities. In addition these people are

traveling greater distances and spending more time to reach their workplaces as compared to those living in the government promoted areas.

4. On an average a person is traveling 10.71 kilometers and spending about 26.93 minutes to reach the respective workplace. This is a result of the vast extent of the city limits, high traffic volume and inefficient public transportation system.

5.4.5 Environmental aspects:

1. On an average 1.44 kilograms of solid waste is being generated per household per day, amounting to 607 tonnes per day at the city level. At present this is being dumped at two sites in the city, viz, Alambagh and Jankipuram which were once upon a time located at the city's fringe but at present are well within the municipal limits and surrounded by residential areas, thereby creating health hazard. The disposal has been observed to be better in the government supported areas in terms of collection points and the frequency of collection. On an average in 60% cases, proper disposal has been observed.

2. Greater fraction of the residents of areas developed by private developers, have been found to be utilizing the renewable sources of energy. These users generally belong to the higher income class.

Chapter 6.

RECOMMENDATIONS AND STRATEGIES:

6.1 Recommendations & Strategies:

The various recommendations and strategies which have been derived from the studies have been categorized under various headings as follows:

6.1.1 Housing type, services and facilities:

1. Single storied construction should be discouraged and multistoried to be encouraged to ensure proper density (medium if not high) by provision of some incentives. This will ensure lesser coverage on the ground & slower expansion rate of the city limits. This approach will also help reducing the cost of infrastructure by reducing the length of water supply, drainage and sewerage lines and road lengths.
2. The areas having low housing densities may be traced out and subjected to re-densification. This may be achieved by selling off the roof slabs for construction of an additional floor (considering the structural stability at the same time) or by allowing additional ground coverage in the plots (relaxation in the setbacks).

6.1.2 Financial aspects:

1. Efforts should be made to reduce the investment per unit so as to reduce the effective price. Shared areas like open spaces/ parks/ playgrounds, convenient shopping centers etc would be better shared, thereby reducing the cost of provisions.
2. In order to encourage the sector of population which has the capacity to invest in housing they should be given some incentives or relaxation so that provision of rental accommodation turns up as a lucrative venture for them and thereby increase the housing stock. This will also ensure higher residential density.
3. The above two measures will not only promote higher densities and lower cost of infrastructure per residential unit, but also help regulating the rapidly hiking land prices and slower sprawl of the city limits.

4. There is a need to work out certain finance options for the low income group as well. Pre built houses scheme was tried at Vikas Nagar for the lower income class but most of them after allotment either sold it or have rented it for money. Thus there should be some regulation to stop this practice.

6.1.3 Regulations:

1. The difference in the quality of provisions in government & private settlements should be checked by imposing a set of terms and conditions on the private developers. They may be granted permission in phased manner so as to ensure proper implementation of the supervised scheme and provision of required services and facilities simultaneously.
2. A variety of plot sizes should be made available to the customers, so as to suit a variety of income groups.

6.1.4 Transportation:

1. Modes other than MRTS, like taxi or buses can serve the same purpose in lesser number of breaks and within lesser time. Thus there is a need to strengthen the rail network and to enhance the coverage. Although the tempo service is satisfactory, but the bus service needs improvement in terms of greater coverage.
2. The linkages of access to the city center and market places should be checked so as to ensure better mobility in addition to the provision of market places in outer areas in long term.
3. Bicycle lanes may be promoted to encourage this eco-friendly personal transportation option, as is being done in several countries like China, Japan, America and many other western countries.
4. The road transportation system needs immediate improvement in terms of quality, coverage and routes followed.

6.1.5 Environmental aspects:

1. There is a need to relocate the municipal dumping sites, as they are posing health and environmental hazard.
2. The solid waste disposal system should be strengthened by provision of dustbins, by increasing the frequency of garbage collection & adoption of new strategies such as using paper bags instead of polythene bags, segregation of organic and inorganic wastes and thereafter separate processing.
3. The battery driven autos have proved to be successful as a public transportation mode. In addition to the low operating cost, they are eco-friendly with no emission. These autos should be encouraged along more traffic routes.

6.1.6 Layouts:

The following set of recommendations has been worked out from the observations made in the four selected residential areas:

1. The layout should support lesser lengths of service networks so as to minimize the infrastructure cost per household.
2. Parks / open spaces should be well segregated from the major traffic arteries to avoid mishaps and noise, and should be uniformly distributed throughout the layout.
3. Hierarchy of road widths should be adopted along with a systematic road network.
4. The layout the colony should ensure easy access to various services and facilities. For these provisions private partnership may be sought, which will not only generate employment opportunities but also ensure easy and regular maintenance.
5. Incompatible intermixing of land uses should be avoided.
6. Vacant plots should be checked for encroachment by slum dwellers or businessmen or its conversion to a garbage collection spot.
7. Signage plays an important role in a housing layout, so it should also be given due importance as it helps an outsider locate the desired position.

6.1.7 General Recommendations:

1. If the new residential area is developed along the main traffic corridors/ highways/ roads, they develop at a rapid rate due to easy accessibility, (for example, new areas like Gomtinagar and Indiranagar). Thereafter the nearby areas also develop at a faster rate due to the newly available infrastructure facilities and services. The linkage and accessibility are thus important determinants of the locational aspect. Fast communication is essential to make the area develop at a rapid rate. The roads, taxi routes, MRTS etc should be made readily available.

2. Private sector partnership may be sought for new ventures (like for example, Aashiana colony was developed jointly by the Lucknow Development Authority and Ansals Ltd.) which may prove to be better in terms of efficiency and reduce the burden of the authorities.

3. Non- government organizations may be called upon to promote specific housing types, such as housing for the low income group, using low cost construction technology and mass housing schemes. Building research organizations may provide a technical hand.

4. The private developers should be imposed with some regulations and restrictions, like those related to subdivision of land, regulation of the plot sizes, setbacks, provision of facilities and services, scope for future expansion etc. The development process should be supervised by some regulatory body to ensure proper implementation of the scheme in a phased manner.

Chapter 7.

CONCLUSION:

7.1 Conclusion:

In the light of the present study, it may be concluded that, in order to meet the changing needs of the growing population, the promoters (Government or private) are required to adopt new strategies and methodologies. This will not ensure more precise action plans, faster implementation of the schemes and greater efficiency of the system.

Higher densities, revised plot sizes and standards, rental housing & re-densification etc may be the tools to be adopted to make the schemes more suitable to the contemporary approach of shrinking requirements, wherein the factors like high land costs, land scarcity and low availability play their respective roles.

In addition to the strengthening of the Government's approach, the role of the private developers / promoters needs to be supervised so that they provide for proper services and facilities as a simultaneous process in new settlements.

Thus the newly adopted strategies shall impart a more systematic and foreseen outlook to the city's expansion, instead of the haphazard and unplanned growth. The new residential areas thus developed shall have a more fulfilling and satisfying character, by virtue of better services and facilities.

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Demographic profile of Lucknow city: Appendix A

Decadal variation (%) in population:

	1961-1971	1971-1981	1981-1991	1991-2001
Lucknow	24.14%	23.79%	65.66%	35.81%

Population of Lucknow city:

	1961-1971	1971-1981	1981-1991	1991-2001
Lucknow	8,14,000	10,08,000	16,69,000	22,67,000

Slum population and % to the total population:

	Population	Fraction
Lucknow	3,74,800	22,67,000 (16.53%)

Houseless households and population (1991)

	No. of households	Houseless households	Houseless population		
			Persons	Males	Females
Lucknow	2,93,130	4,852	11,192	9,224	2,688

Census houses and the uses to which they are put – 1991

	Total no. of census houses	Houses vacant	Residence	Shop – cum residences	Workshop / factory – cum – residence including household industry	Residences in combination with other uses
Lucknow	3,68,790	35,110 (21.96%)	2,74,190 (74.35%)	7,355 (1.99%)	3,080 (0.84%)	3,200 (0.86%

Distribution of Pucca, Semi-pucca, Serviceable kutcha and non-serviceable kutcha – 1991

	Total no. of census houses	Pucca houses	Semi-pucca houses	Serviceable kutcha houses	Non- serviceable kutcha houses
Lucknow	3,68,790	3,22,515	23,175	12,810	12,810

Type of houses

	Owned	Rented	Others	Total
Lucknow	1,88,390	95,970	11,410	2,95,885

* Source: Government of India, Ministry of Urban Development & Poverty Alleviation, National Building Organisation, New Delhi, **"Metropolitan Housing Statistics 2002".**

HOUSEHOLD SURVEY IN STUDY AREAS

Appendix B
Questionnaire Format.

Conducted by: Niraj Dubey, M.U.R.P.,
DEPARTMENT OF ARCHITECTURE AND PLANNING,
INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE.

A. Identification:

1. Name of head of family: .....
2. Religion:..... ..... 3.Occupation: .....(Sec:.....)
4. Address: .....
..... 5. Number of earning members: .....

Age Gr.	Male	Female
<5		
5-15		
15-25		
25-60		
>60		

Education	Male	Female
<8th Std.		
High School		
Intermediate		
Graduate		
Post Graduate		

B. Issues:

1. Type of housing (√):
   i) Own house. ii) Rented house. iii) Govt. leased house
   iv) Company leased house. v) Others: .....
   * Rent / lease amount (per annum).....
2. You are living in this house since (√):
   i) < 5 years. ii) 5 – 10 years. iii) 10 – 15 years. iv) > 15 years.
   Before this house, which area were you living in? .....
3. Number of rooms in the house (√):
   i) 1 ii) 2 iii) 3 iv) 4
4. Number of floors in the house (√):
   i) 1 ii) 2 iii) 3 iv) >3
   * Basement? Yes / No.
   * Have you rented any of your floors? : Yes / No.
5. Reason for opting a house in this locality (√):
   i) Nearness to workplace ii) Nearness to relatives
   iii) Access to facilities iv) Affordable cost
   v) Ancestral property vi) Others .....
   * Land cost : When purchased: .....current: .....
   * Which residential area in Lucknow do you consider best to live in? .....
   Why? .....
6. Any housing finance scheme or loan availed: Yes / No.
   If yes, name of the agency:.....
7. While choosing a residential location which of the following factors do you consider to be most important (√):
   i) Value of land ii) Proximity to workplace
   iii) Proximity to good education iv) Well linked by transportation
   v) Good social environment vi) Proximity to major markets
   vii) Public services and recreation
8. Electricity supply:
   i) Supply hours ..... ii) Voltage fluctuations: Yes / No.
9. Transportation:
   i) Nearest tempo stand .....(kms.) ii) Nearest bus stand: .....(kms.)
   iii) Nearest MRTS station.....(kms.) vi) Nearest petrol pump.....(kms.)
   v) General comment on the facility : Overcrowded / good / satisfactory.

10. Health care facilities:
    i) Nearest available(kms.): Clinic: Dispensary: Nurs. Home: Hosp:
    ii) Nature : Govt. / Private. iii) Economic factor: Cheap/expansive/satisfactory.
11. Education: {i)Nearest(kms.)}
    Nurs: Pr.School: JH sch.: H.Sch: Int. col: Deg. Col:s
    ii) Nature: Govt./Private. iii) Economic factor:Cheap /expansive /satisfactory.
12. Telegraph and communication service:
    i) Nearest post office.....(kms.) ii) Nearest cyber café: .....(kms.)
    iii) Nearest PCO.....(kms.) iv) Number of post boxes:Sufficient / insufficient.
13. Parks and open spaces:
    i) Nearest available.....(kms.) ii) Size of the park: Small / medium / large.
    iii) Maintenance Good / poor / satisfactory.
14. Convenient shopping:
    i) Nearest available: .....(kms.)
    ii) Useful for : All purposes / very few purposes / almost all purposes.
    iii) Most preferred shopping area in the city: .....
    iv) Nearest Govt. control rate shop:..... v) Nearest LPG cylinder agency : .....
15. Community recreation facilities:
    i) Nearest cinema hall.....(kms.) ii) Nearest club.....(kms.)
    iii) Nearest community center / marriage hall : .....(kms.)
16. Security and safety:
    i) Crime rate: High / low / moderate. iii) Nearest police station .....(kms.)
    ii) Police assistance and patrolling : Good / bad / satisfactory.
    iv) Any private system of security: Guard / security alarm / others .....
17. Vehicles owned (√ and put numbers):
    i) Scooter ( ) ii) Car ( ) iii) Cycle ( ) iv) Any other ( )
18. Pollution and hygiene level (√):
    i) Dust and smoke ii) Foul smell (garbage) iii) Noise; source.....
    iv) Water stagnation v) Flies & mosquitoes vi) others .....
19. Solid waste:
    i) Quantity generated:..... ii) Subsequent processisng:.....
20. Gross family income (√):
    i) < 5000 ii) 5000 – 10000 iii) 10000 – 15000 iv) >15000
21. Gross family expenditure (√):
    i) <2500 ii) 2500 – 5000 iii) 5000 – 10000 iv) >10000
22. Expenditure distribution (%):
    i) Food: ii) Energy: iii) Transportation:
    iv) Education: v) Recreation: vi) Others .....
23. Energy consumption (per month):
    i) Electricity: ii) LPG: iii) Kerosene: iv) Petrol / diesel:
24. Application of renewable energy:
    i) Solar cooker ii) Solar water heater
    iii) Bio-gas technology vi) Others .....
25. Distances, time taken and mode of transportation for various destinations:

S.No.	Destination	Distance (kms.)	Time taken (hrs.)	Mode
1	Workplace			
2	Market			
3	Recreation			
4	Education			
5	Medical facility			

26. Any suggestions: .....
    .....

The Work Centers of the City:

Appendix C

CENTRAL GOVT. OFFICES:

All India Handicraft Board
B-46, Mahanagar Extension

All India Radio
V.S. Marg-1

Archaeological Survey of India
Balliguard Cottage, Golaganj

Birbal Sahni Institute of Palaeobotany
53-University Road-7

Bureau of India Standards
Seth Bhawan, 12-B, Naval Kishore Road, Hazratganj

Canteen Stores Department,
Ministry of Defence, Jail Road

Central Administrative Tribunal
Lucknow Bench, Motimahal, 2-R.P.Marg

Central Bureau of Investigation
7-Naval Kishore Road

Central Bureau of Narcotics
B-57, Sector-A, Mahanagar

Central Drug Research Institute
Chhatar Manzil Palace, Kaisar Bagh

Central Drugs Standard Controller
2-Janpath Road, Aliganj

Central Excise
19-C, Vidhan Sabha Marg

Central Food Technology Research InstitutePilot
Plant Building, C.D.R.I.-1

Central Govt. Health Scheme
9-R.P.Marg

Central Govt.Industrial Tribunal Labour Court B-
1/36, Sector 'A', Aliganj

Central Ground Water Board,
Northern Region, 21/496-Indira Nagar

Central Institute of Horticulture for Northern Plains
B-217, R.B.L. Road

Central Institute of Medical & Aromatic Plants Near
Kukrail Picnic Spot

Central Institute of Plastic Engg. & Tools B-27,
Amausi Industrial Area

Central Public Works Department
G.S.I. Campus, Sector-E, Aliganj

Central Reserve Police Force
2-134, Vijay Khand, Gomti Nagar

Central silk Board
Vikas Deep, 22-Station Road

Central Telegraph Office
G.P.O. Building Hazearganj

C.S.I.R. Polytechnology Transfer Centre
B-46, Nirala Nagar

Custom Division
2-255, Vivek Khand, Gomti Nagar

Doordarshan Kendra
24-AshokMarg

Field Publicity Directorate
Ministry of I & B, 19A-.V.S. Marg

Film Division Central
Durga Bhawan, Kapoor Lane, M.G. Marg

Geological Survey of India
GSI Building Aliganj

Indian Air Force
Bakshi Ka Talab

Indian Institute of Sugar Cane Research
Raebareli Road

Industrial Toxicology Research Centre
MG Marg-1

Information and Broadcasting Central
M.G. Marg

Information Education & Communication Bureau
4-Pandit Nagar Road Old K.P.Road

I.S.T.R.A.C: Ground Station (Space Department)
Sector-C, S.T.P. Road, Yojna Kursi Road

Institute of Chartered Accountant of India Jagriti
Institutional Area, Vikas Khand, Gomti Nagar

Kendriya Sanskrit Vidyapeeth
B-1, 89-Aliganj

Kendriya Vidyalaya Sangathan
Sector 'J' Aliganj

Labour Central
209-Regency Plaza, Aliganj

Marketing & Inspection D.T.E. (central)
9A-1, Jopling Road

Meteorological Department
Amausi Airport

National Airport Authority
Lucknow Airport, Amausi

National Boatanical Research Institute
1-Rana Pratap Marg

National Cadet Corps D.T.E. U.P.
Ashok Marg

National Commission for S.C. & S.T.

National Bureau of Fish Centre Resources 351-28,
Radha Swamy Bhawan, Talkatora Road

National Informatics centre
Yojna Bhawan

National Research Lab for Conservation of CUL
Sector 'E'- 3, A.H.S.

National Sample Survey Organization
38-Kumanchal Nagar

National Savings Organization
Halwasiya Court, Hazratganj

National Service Scheme
Indira Nagar, Church Road

National Water Development Agency
A-1222, Indira Nagar

Northern Railway
Charbagh

North Eastern Railway Office
Ashok Marg

Railway Mail Service
Charbagh Lucknow

R.D.S.O
Manak Nagar

Rashtriya Lalit Kala Kendra
Plot-1, Sector 'E' Aliganj

Survey Of India
4-P.N. Road

STATE GOVT. OFFICES:

Accountant General U.P.
14-V.S. Marg

Census Operation U.P.
52-W.H. Road

Chief Post Master General
U.P. Circle, Hazratganj

Civil Aviation Department
LW-Airport-9

Director of Audit & Food
6-Habibullah Estate, Hazratganj

DTE of Revenue Intelligence

DTE of Sugarcane Development
c-896, Sector-C, RaheemNagar Chauraha,
Mahanagar

DTE of Technology Develeopment & Production
H.A.L. Post Office

G.P.O.
Hazratganj

Homepathy Drugs Research Institute
B-1433 Indira Nagar

Income Tax Department
5- Ashok Marg

Khadi & Village Industries Commissioner Lajpat Rai
Bhawan, Kaiserbagh

Ministry of Civil Aviation & Tourism
Ashok Marg

Ministry of Envirinment and Forest
4-Windsor Palace

Ministry of External Affairs
B104-18 Niarala Nagar

Ministry of Food
B1-126, Sector 'K' Aliganj

Ministry of Food Mobile Extension Unit
4-520, Vikas Nagar

Ministry of Food Processing Industry
945-2, Indira Nagar

Ministry of Labour
5-Mira Bai Marg

Ministry of Non-Conventional Energy Sources
A1/18, Sector-H, Aliganj, Purania Crossing

Ministry of Surface Transport
B-748, Sector 'C' Mahanagar

Ministry of Tourism
Sector 'C' Aliganj

Passport Office Regional Centre
B.N. Verma Road

Press Information Bureau
12-Prem Nagar

Program Evaluation & Organization Planning 87-
Halwasiya Market

Regional Office for Health & Family welfare C-II, B-
80 Mahanagar

Regional Research Institute Ayurveda
474-6, Sutapur Road

Regional Research Institute of Unani Medicines
DSE-958, Sector 'C' Sitapur Road

SC/ST Commission
C-44, Sector 'F' Kapoorthala, Aliganj

Sr. Suptt. Post Offices
New Hyderabad

Subsidiary Intelligence Bureau
110, Mall Avenue-1

List of wards in the city

Appendix D

S.No.	Name of the Ward	Ward No.	Zone	Area in Sqkm
1	Vikramaditya Ward	11	Zone-1	4.44
2	Murli Nagar Ward	13	Zone-1	0.26
3	Lal Kuwan Ward	15	Zone-1	0.23
4	Ram Mohan Rai Ward	22	Zone-1	2.65
5	Rani Laxmibai Ward	25	Zone-1	0.96
6	Mahtma Gandhi Ward	31	Zone-1	1.74
7	Jagdish Chandra Bose Ward	32	Zone-1	0.95
8	Hazratganj Ward	42	Zone-1	1.23
9	Ramtirath Ward	46	Zone-1	0.53
10	Babu Banarsi Das Nagar Ward	50	Zone-1	0.48
11	Peer Jalil Ward	54	Zone-1	0.95
12	Golaganj Ward	62	Zone-1	0.24
13	Aminabad Ward	65	Zone-1	0.35
14	Yadunath Sanyaal Ward	67	Zone-1	0.25
15	Gautam Buddh Ward	68	Zone-1	0.32
16	Vazirganj Ward	77	Zone-1	0.59
17	Hussainganj Ward	78	Zone-1	0.26
18	Nazarbagh Ward	80	Zone-1	0.22
19	Shivaji Marg Ward	81	Zone-1	0.25
20	Ganeshganj Ward	89	Zone-1	0.21
21	Tilak Nagar Ward	8	Zone-2	0.55
22	Ambedkar Nagar Ward	21	Zone-2	2.15
23	Rajendra Nagar Ward	47	Zone-2	0.58
24	Jal Sansthan Ward	49	Zone-2	0.39
25	Labour Colony Ward	52	Zone-2	1.42
26	Mashakganj Ward	59	Zone-2	0.14
27	Netaji Subhash Chandra Ward	70	Zone-2	1.32
28	Aishbagh Ward	74	Zone-2	0.38
29	Hardin Rai Nagar Ward	75	Zone-2	0.94
30	Moulviganj Ward	76	Zone-2	0.19
31	Bashiratganj Ward	82	Zone-2	0.33
32	Motilal Nehru Nagar Ward	85	Zone-2	0.69
33	Yahiaganj Ward	91	Zone-2	0.41
34	Chandra Bhanu Gupt Ward	98	Zone-2	0.36
35	Malviya Nagar Ward	99	Zone-2	1.03
36	Sewa Gram Stadium Ward	100	Zone-2	0.82
37	Abdul Hamid Ward	101	Zone-2	0.08
38	Kunwar Jyoti Prasad Ward	107	Zone-2	1.15

39	Raja Bazar Ward	108	Zone-2	0.22
40	Rajaji Puarm Ward]	109	Zone-2	0.87
41	Kundari Rakabganj Ward	110	Zone-2	0.54
42	Faizullaganj Ward	9	Zone-3	10.28
43	Janaki Puram Ward	14	Zone-3	3.58
44	Mahakavi Jaishankar Prasad Ward	27	Zone-3	2.15
45	Mahanagar Ward	34	Zone-3	1.75
46	Lala Lajpatram Ward	38	Zone-3	0.88
47	Lohia Nagar Ward	40	Zone-3	0.74
48	Triveni Nagar Ward	43	Zone-3	3.18
49	Begam Hazrat Mahal Ward	44	Zone-3	2.05
50	Mankameshwar Mandir Ward	45	Zone-3	1.07
51	Daliganj Ward	48	Zone-3	0.60
52	Bajragbali Mandir Ward	51	Zone-3	1.49
53	Chandganj Kala Ward	57	Zone-3	0.95
54	Ashok Azad Ward	60	Zone-3	0.74
55	Bharatanedu Harishchand Ward	66	Zone-3	2.54
56	Ayodhyadas Ward	69	Zone-3	0.87
57	Aliganj Ward	72	Zone-3	1.84
58	Nirala Nagar Ward	93	Zone-3	0.83
59	Vivekanand Puri Ward	97	Zone-3	1.30
60	Kadam Rasool Ward	103	Zone-3	0.84
61	Shaeed Bhagat Singh Ward	5	Zone-4	7.78
62	Nishatganj Ward	10	Zone-4	0.93
63	Rajiv Gandhi Nagar Ward	18	Zone-4	5.31
64	Chinhat Ward	20	Zone-4	7.95
65	Indira Pridarshni Ward	28	Zone-4	2.31
66	Rafi Ahmed Kidwai Nagar Ward	33	Zone-4	8.24
67	Shankar Purwa Ward	37	Zone-4	3.67
68	Maithalisaran Gupt Ward	55	Zone-4	2.43
69	Babu Jagjivan Ram Ward	58	Zone-4	2.03
70	Colvin College Ward	61	Zone-4	1.50
71	Ismailganj Ward	73	Zone-4	3.80
72	Gomti Nagar Ward	79	Zone-4	2.50
73	Lal Bhadur Shastri Ward	86	Zone-4	3.40
74	Paper Mill Colony Ward	88	Zone-4	0.54
75	Indira Nagar Ward	96	Zone-4	2.09
76	Ibrahimpur Ward	1	Zone-5	7.74
77	Kharika Ward	2	Zone-5	3.06
78	Raja Bijli Pasi Ward	3	Zone-5	4.19

79	Sarojani Nagar Ward	4	Zone-5	8.80
80	Guru Govind Singh Ward	6	Zone-5	3.35
81	Sharda Nagar Ward	7	Zone-5	8.00
82	Vidya Devi Ward	12	Zone-5	1.47
83	Hind Nagar Ward	16	Zone-5	4.44
84	Jai Prakash Nagar Ward	19	Zone-5	1.06
85	Babu Kunj Behari Lal Ward	23	Zone-5	1.21
86	Ramji Lal Nagar Ward	24	Zone-5	0.88
87	Geetapalli Ward	29	Zone-5	1.83
88	Om Nagar Ward	30	Zone-5	0.67
89	Gurunanak Nagar Ward	35	Zone-5	0.94
90	Keshari Khera Ward	53	Zone-5	5.59
91	Sardar Patel Nagar Ward	56	Zone-5	1.64
92	Aalam Nagar Ward	63	Zone-5	12.73
93	Chitrgupt Nagar Ward	64	Zone-5	3.28
94	Haiderganj Ward	17	Zone-6	1.29
95	Khaniya Madhavpur Ward	26	Zone-6	2.34
96	Balakganj Ward	36	Zone-6	16.15
97	Mallahi Tola Ward	39	Zone-6	1.35
98	Husainabad Ward	41	Zone-6	1.97
99	Sadatganj Ward	71	Zone-6	1.96
100	Maulana Kalve Aabid Ward	83	Zone-6	0.63
101	Daulatganj Ward	84	Zone-6	1.26
102	Gadhi Peer Khan Ward	87	Zone-6	1.55
103	Ashrafabad Ward	90	Zone-6	0.45
104	Kashmiri Mohalla Ward	92	Zone-6	0.46
105	Bhavaniganj Ward	94	Zone-6	0.24
106	Achrya Narendradev Ward	95	Zone-6	0.15
107	Sheetaladavi Ward	102	Zone-6	0.56
108	Amberganj Ward	104	Zone-6	0.70
109	Chowk Ward	105	Zone-6	0.67
110	Bazar Kaliji Ward	106	Zone-6	0.26