EVALUATION OF PLANNING AND DEVELOPMENT OF EXTENDED CITIES— CASE STUDY SALT LAKE CITY

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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CERTIFICATE

CANDIDATE'S DECLARATION

I hereby certify that the work which is being presented in dissertation entitled **"Evaluation of Planning and Development of Extended Cities - Case Study - SALT LAKE CITY"** in partial fulfilment of the requirement for the award of degree of **Master of Urban and Rural Planning** submitted in the Department of Architecture and Planning, University of Roorkee, Roorkee is an authentic record of my own work carried out for a period of six months from August 1994 to January 1995 under the supervision of **Prof. Rakesh Chandra,** Department of Architecture and Planning, University of Roorkee, Roorkee, India.

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

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

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INTRODUCTION

1.1 IDENTIFICATION OF THE PROBLEMS

Both the developed and third world cities are under tremendous pressure of growth. Particularly, the third world countries due to recent trends of high urbanisation, pose a serious problem. The cities are growing organically in a most unplanned manner. This poses a serious threat on surrounding agricultural lands, creating unserviced settlements. The worst affected are the Metropolis which enjoy a loins[10] share of the urbanization in developing countries, attracting large numbers of immigrants both from the rural and urban hinterland. Over population, poor dwelling standards, lack of urban facilities leave fatal traces on the life of man and growth of children. Such conditions have ill effects on working abilities and economy and degrade the human person who is exposed to humiliation.

Most of the developed countries Metropolis have already experienced such a situation and have been able to stabilize/control the situation. The third world countries are trying to share their experience and adopting some of their policies. However, in many cases the situation is quite different from Western Countries.

In this thesis, the focus will be on 'A Study and Analysis of Salt Lake (Bidhannagar) city as extension of

Calcutta and evaluate its planning and development as an extended city which was growing organically in a linear fashion and described as the 'Worst Urban Situation' in the world.

To have an understanding about the expansion of Metropolis some case studies from different parts of the world will be discussed. After appraising the expansion project in Salt Lake, suggestions will be drawn to have proper expansion of metropolis in future, which may render harmony among man, nature, society, shells and networks - the five elements, that make up human settlements.

1.2 SCOPE

1. To identify the various reasons which cause experimental growth of a Metropolis. This would enable us to perceive the situation in advance and allow us to deal with the problems.

2. To study and analyse Salt Lake City with respect to :
   * The intention of Salt Lake,
   * Implementation of the plan, and
   * The present situation of Salt Lake.

3. To establish the gap between intentions and reality.

4. The analysis should help to reveal the reasons behind the gap so that proper guidelines could be suggested for any planned future expansion.

1.3 OBJECTIVES

1. To identify the needs and problems for expansion of a Metropolis with respect of Calcutta.

2. To evaluate the stages and performance of the Salt Lake Project, as an example of planned Metropolitan expansion.

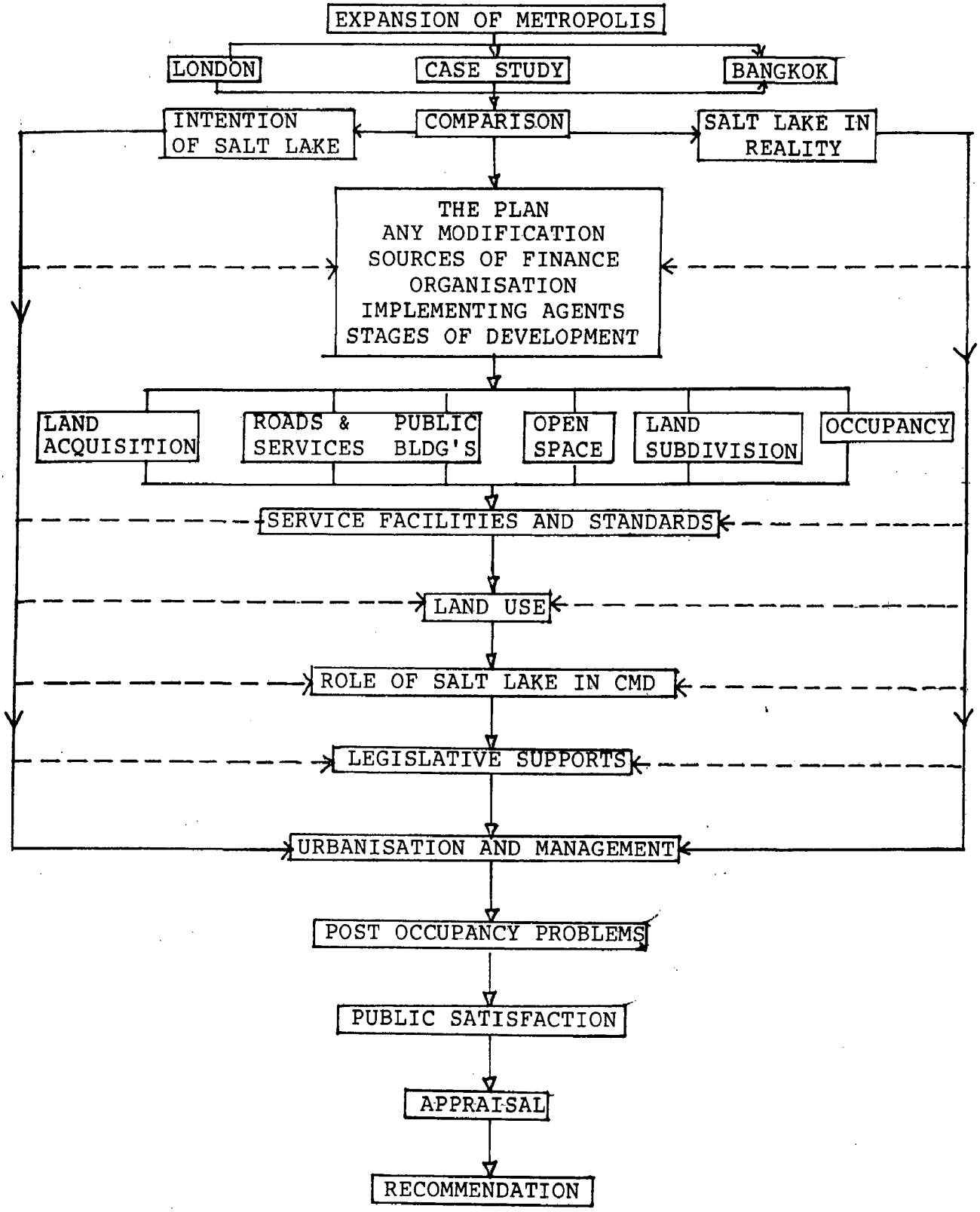
3. To suggest a set of guidelines for similar projects based on the experience of Salt Lake City Development.

1.4 LIMITATIONS

Since no separate budgetory allotment has been made as a whole for the Salt Lake Development Authority, it become difficult to get the proper pictures of cost benefit. Due to non availability of some data, the comparison of development would become difficult also in some cases.

The thesis would be limited in its study for the planned expansion of Calcutta, with respect to Salt Lake only and would not incorporate other planned expansions for the lack of time. In primary survey the sample size has to be taken small becuase of the want of man power. For household survey on 0.5% sample survey may be possible.

METHODOLOGY



CHAPTER 2

CHAPTER - 2

LITERATURE SURVEY - METROPOLITAN EXPANSION

2.1 METROPOLITAN EXPANSION

Doxiadis stated in 1958, 'I do not think we can have any doubts that we are moving, not only from the city to the metropolis but also from the metropolis to the megapolis...

Following the idea of a growing centre along one of the existing axis, we are gradually led to a dynapolis'. For the metropolis's which are situated along any river have very strong axial growth and tend to move organically in a linear fashion. Calcutta is no exception. In case of Calcutta this North South Linear Axial growth is very strong because of the existence of low lying and marshy lands on both sides.

Almost all the metropolitan cities of the world are situated on river banks and initially followed the river bank unless it was planned to break the axis. Because of this axial growth, Calcutta is having to break it. Many metropolis have successfully been able to break the undesirable unidirectional growth and may of them are trying to break it. Here, some experiences from different countries will be studied to share their experiences and to draw guide lines for metropolitan expansion.

Case studies have been selected from London and Bangkok both of them are situated on river banks. The city London started developing organically initially like Calcutta. So, it is very relevant to share London's experience for Calcutta. But in may cases, the situation of developed countries differ from India. Bangkok - a third world metropolis has studied here to compare the experience of a similar economic country.

At this juncture, it would be relevant to dwell briefly on the value of the New Towns experiment within a world context. For this purpose, PETER SELF has suggested three of the purposes of new towns which in very different ways are of considerable interest and value.

(a) As answers to 'megalopolis', or the excessive concentration of people and economic activities within great cities or conurbations.

(b) New towns as ways of organising the vast volume of new development which will occur anyhow, along more beneficial lines.

(c) New towns are 'balanced communities'.

2.2 CASE STUDIES

The following case studies have been adopted to comprehand. The expansion process and study similar or near similar example and the strategy adopted to tackle the

situation. Through this study and its inferences the evaluation of Salt Lake shall be based.

2.3 LONDON - A CASE STUDY

England is often quoted as an example by town planners in many countries, some of its plans - such as the Abercrombie Plan - and its new towns being world famous. The new towns, conceived as part of a national policy of land development (the Barlow report of 1940) and a regional town planning policy developed from this (the Abercrombie Plan of 1944), comprised of the most remarkable achievements in town planning. Nevertheless, the results of the 1961 census show that contrary to the forecasts of the Abercrombie Plan, the growth of the London area had not been checked. The same problems remained, the solution adopted twenty years before having proved inadequate in the face of changing circumstances. The resulting South East Study has become a guide for present development.

2.3.1 The Outlines of the Barlow Report

In 1937 a Royal Commission was set up under the Chairmanship of Sir Montague Barlow to study the distribution of industrial population and the disadvantages of urban and economy over concentration and to suggest solutions. These terms of study obviously prejudged the Commission's conclusions to some extent. After three years work, the report was presented in January 1940.

After an examination of the solutions available under existing legislation comes the most interesting section of the report setting out the Commission's proposals as follows

- The need for reorganization of congested urban areas.
- The establishment of a policy of decentralization and deconcentration of industry.
- The search for a balance between different regions with respect to the size and variety of industrial activity.

Furthermore, it recommends the creation of a national authority, outside Parliament, charged with putting these proposals into force and with working out the details of industrial decentralization for urban development.

The commission laid particular stress on the problems of the London area, seeing it as a prototype of a congested and over large built up area.

2.3.2 The Abercrombie Plan for Greater London

The main themes of the Barlow Report were adopted and developed by Sir Patrick Abercrombie in the Greater London Plan on the following lines :

* No fresh industry was to be established in the country of London or its adjoining countries and regulations for controlling the increase of industrial employment were to be instituted.

* A number of industries and their personnel were to be dispersed.

* The total population of Greater London should be decreased.

* The part of the existing population was to be resettled outside the limits of the London area.

* The Port of London was to retain its important role.

* New planning organisations were to be set up to serve the London region.

The following are the main proposals of the Greater London Plan : zoning based on a system of concentric rings :

* The first corresponding with the central built up area, whose high density made dispersal necessary. The maximum population densitires for the different sectors of this zone, slightly larger than the County of London, were 185-250 per hectare.

* The second was formed by the suburbs with spaced out housing and low density. This zone was to remain stable in respect of housing and industry with a maximum of 125 people per hectare.

* The third was formed by the majority of the land defined in the Green Belt Act of 1938. Almost entirely agricultural at that time, it was to be used for recreational purposes but at the same time to keep its

rural character. This zone was to be kept free from industrial development and the growth of existing towns and villages was to be strictly controlled. This zone, 25-35 km from the centre of London, was to absorb a maximum of 300,000 new inhabitants.

* The fourth, whose outer limit was less easily definable, would absorb the section of the London population dispersed from the centre. It was in this zone that the new towns would be built.

The policy of population dispersal aimed at reducing the population of central London to 340 per hectare.

The Abercrombie Plan, with its concentric pattern, was based on the assumption, justifiable at the time, of the statbilization of the population of the built up area. Its main aim was to ensure the dispersal of the population by the creation of moderate sized new towns 'with populations of about 50,000' comparable to the Garden Cities envisaged by Ebenzer Howard in the early days of the century.

2.3.3 Expanding Towns

Alongside the new towns, the Abercrombie Plan envisaged the creation of large housing estates with low population densitires (with an average of somewhat over 270 per hectare on the outskirts of London) and the expansion of small towns. The Town Development Act of 1952 provided the administrative and financial framework of these extension :

* The expansion of industrial areas should be accompanied by the creation of corresponding amenities and by the creation of industrial employment, without finding it necessary to impose a strict balance of population and employment.

* They were to permit the decrease of housing density in overpopulated cities (London and its suburbs and the country boroughs), without specifying the methods of selection of families to be rehoused.

* The expansion project must be large in relation to the size and resources of the host community in order to qualify for Treasure aid.

* The body in charge of the operation could be county council concerned, the Greater London council or the appropriate urban district council.

2.3.4 The New Towns

The new towns remained the most important exercise in town planning in the twenty years following the Abercrombie Plan, since they absorbed a population slightly larger than the 383000 envisaged by the town planner in population slightly larger than the 383,000 envisaged by the town planner in 1944. They form an achievement of undoubted interest in the field of town planning and of urban and community life, from the point of view of a balance between

population and employment and of administrative and financial solutions even though the solutions adopted could be improved in the light of experience.

The Reith report proposed that the new towns should be sited built areas of great density to aid in the decrease of their popuation. Of the fourteen towns founded between 1940 and 1950, eight are in the London region, two in the

Another recommendation of the Reith Commission concerned the size of the new towns, suggesting populations of between 20,000 to 60,000.

The road systems have confirmed with a pattern laid out in the Reith Report :

* A regional network linking the new town with the present city and the rest of the region.
* A network of ring roads, and main redial roads in the town.
* An intermediate network giving access to the neighbourhood units.
* A network of local roads.

The road systems have nevertheless often proved inadequate for the unexpected amount of traffic.

Administration

The success of the new towns would have been

impossible without the passing of the New Towns Act in 1946, a few months after the delivery of the Reith Report and less than a year after the setting up of the Commission by Silkin, the first Minister of Town and Country Planning.

The Act followed closely the recommendations of the Commission in creating the necessary administrative and financial machinery, with its own development corporation for each new town.

Finance

The New Towns Act of 1946 provided for the financing of the new towns by a system of long term reasonable loans, repayable over sixty years at varying rates of interest. Interest varied from 3% in 1947 to 6% or more over the last few years. On average, it stood at 5% for the first wave of new towns and over 6% for Cumbernauld. To total loans have by now exceeded £ 650 million and are increasing at the rate of about £ 35 million a year. To obtain a loan, the development corporation has to submit an estimated budget to its ministry and if this is approved the necessary money is soon available.

Employment

A link between employment and housing was essential to the idea of the new towns, so that to obtain a house it is necessary to be able to give proof of a jon in the new town. However, if the jon is subsequently changed to one outside

the town, the house does not necessarily have to be given up. This policy is in the interest of forming a stable and self sufficient society with little movement of population and with an even distribution of workers, professional people and people of different income groups.

 # Population

The new towns or at least those around London were built for the main part between 1950 and 1960, with resulting imbalance demographically as well as socially. The age structure is obviously a very young one at first but this will change as the first arrivals grow older, even if the change is slowed down by population movement. Twice as many young children are to be found in the new towns as in the population of the country as a whole, a considerably higher number of young adults but far fewer adolescents (half the normal porportion), middle aged people (one third to one quarter) and old people (one sixth).

 # Community and Transport

The aim of reducing daily community to a negligible was too ambitious to be fully realized. In fact, approx. 20% of residents of working age in the older new towns are commuters.

Communications with the parent city have been considerably improved.

Internal transport is also necessary, due to the layout of the new town (its low residential density adding to distances and the concentration of work in the centre in the industrial zones).

Parking problems, on the other hand, have become such greater. The increase in motoring had been under estimated.

‡ The Social Life of the Town

The most ambitious aim of the originators of the new towns was probably that of creating in them a true urban community. In the light of experience over the last twenty years, one can see the two main obstacles to be overcome : lack of facilities especially in shopping centres, and the absence of a spontaneous social life.

‡ Changes in the Concept of the New Towns in Britain

In the new towns, the original plans have been realized to a remarkable extent. Nevertheless, there are signs that a rethinking of theories of development has brought a slow but increasing change over the last few years.

2.3.5 Summary

The new towns have achieved some but ny no means all of their aims. Over twenty years the new towns in Britain have absorbed more than 500,000 new residents, two thirds of them in the London area.

In the economic field, a balance of employment and manpower has been achieved, at least in the towns round London. In contrast, the British experiment has been outstandingly successful in two respects : the development corporation in charge of the planning, building and maintenance of the new town, and the very helpful financial system - long term loans (sixty years) at a moderate interest and varying rates of repayment. Both these have made possible the successful outcome - for such despite the reservations noted, it must be called of an experiment that must have seemed bold, indeed at the time of its initiation.

2.3.6 A Strategy for the South East

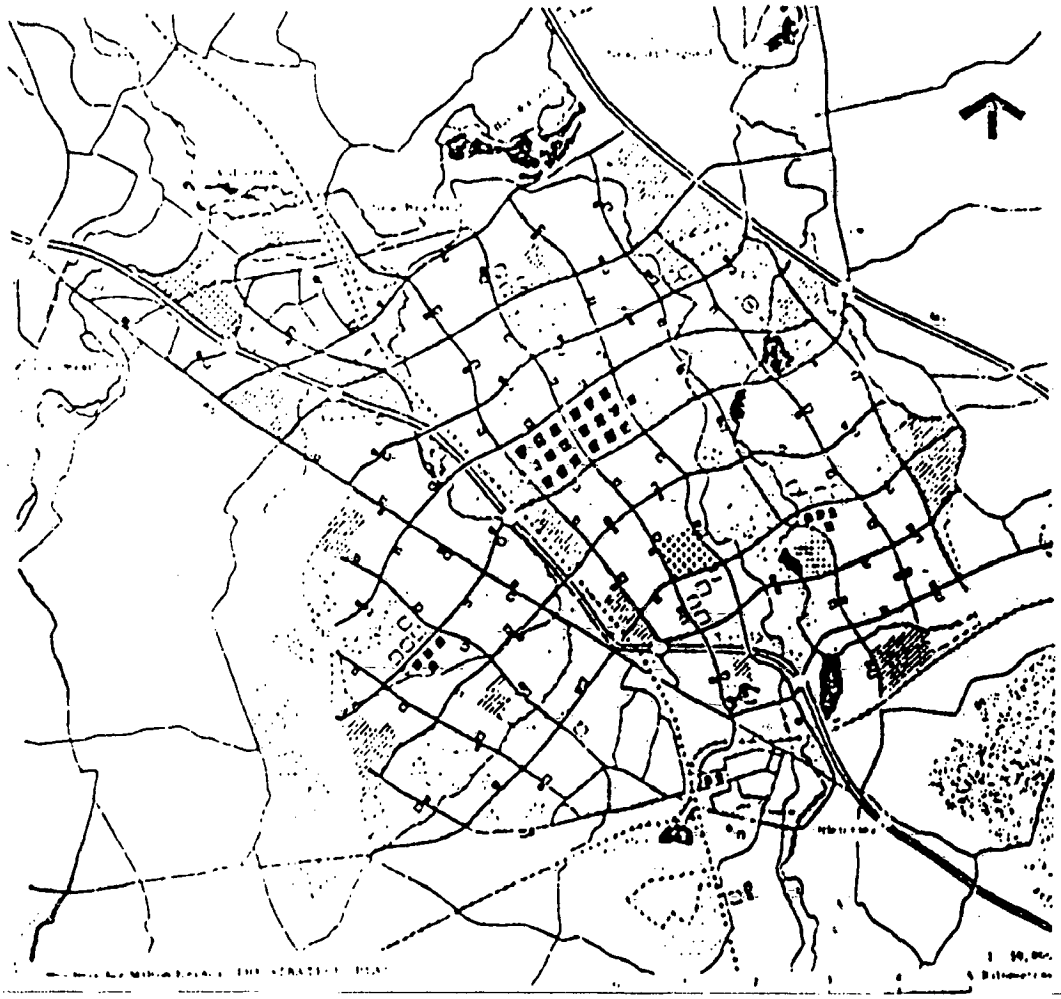
The real originality of the strategy for the South East lies in its complete break with tradition in patterns of town planning in the London area. With the need to preserve a widened Green Belt, urban development could be confined to specific axis, arranged in pairs (one of the pair being the principal) :

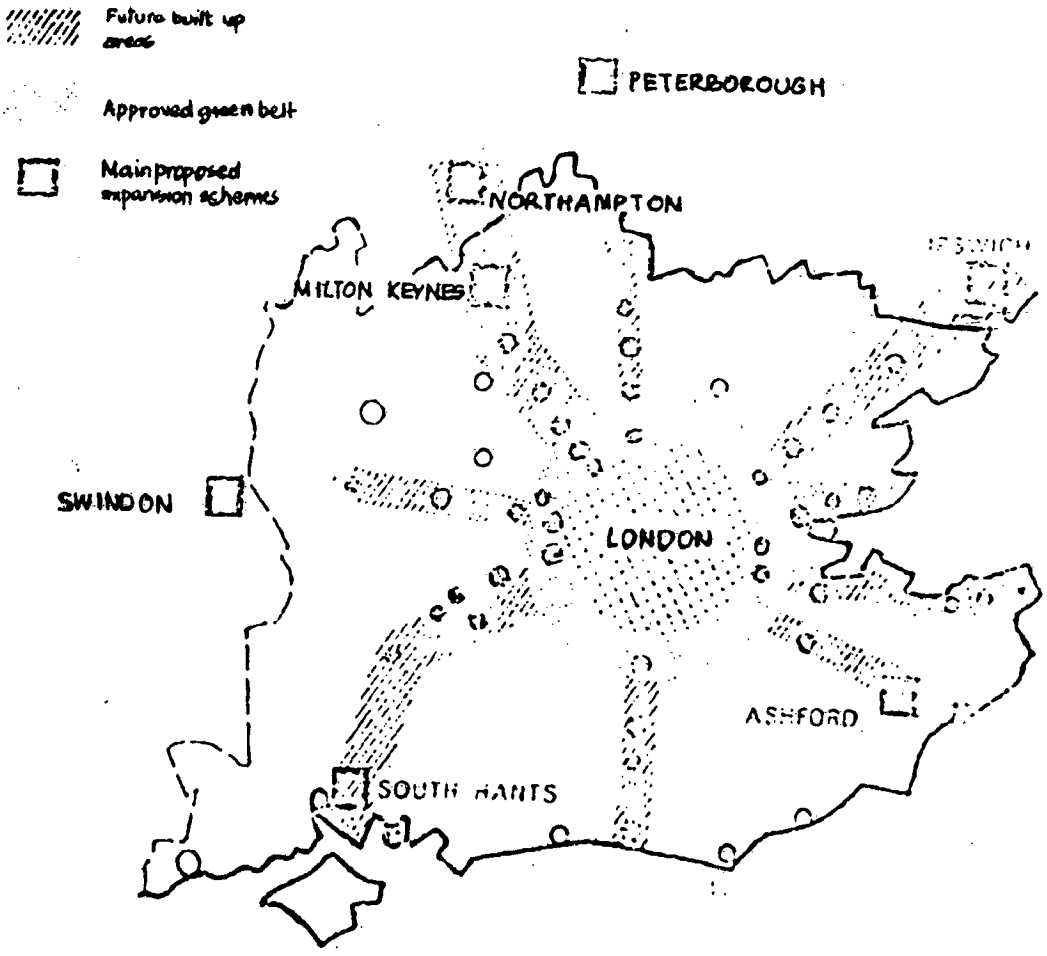
* To the North West : the principal axis towards Milton Keynes and Northampton, and secondary axis towards Peterborough.

* To the East and South East : the principal axis towards Ashford and the secondary axis along the Thames Estuary.

* To the South West : the principal axis towards the new town of South Hampshire and the secondary axis towards Swindon.

MILTON KEYNES





Another innovation in the strategy for the South East is the position it adopts towards employment. While proving the official policy of decentralization, the authorities realised the difficulties this can cause in the balance of employment. Thus, it was needed that it should be adopted with discreation. It was pointless, for instance, to discoverage every kind of industry automatically from setting up in the South East, on the contrary, a balanced scheme was essential for the success of the plan as a whole, Similarly, officer permits should be available to firms that would form an integral part of the strategy for the south east. Small firms of upto 1000 m^2 of floor space would not need permits to built in the suburbs. Lastly a minimum of office building in London itself was desirable, to allow the capital to play its traditional role and to encourage foreign business concerns.

2.3.7. Conclusion

In Britain, the policy of town planning for the London region was formulation immediately after the war, with the Abercrombie Plan, the Reith Commission and the New Towns Act. Despite some errors of foresight in the realm of population increased and the part played by tertiary employment, the policy has achieved some notable success; the first wave of new towns now almost completed.

These have nevertheless shown some failings : they

have not absorbed more than a sixth of the region's population growth and have not succeeded in attracting enough diversity of employment and enough regional facilities to create truely balanced communities. With the 1960s the need to redefine the policy in the light of current conditions and recent findings became clear. Two successive regional studies - South East Study and the Strategy for the South East - laid stress on the need for large scale operations and the need to break with the traditional concentric pattern of expansion for the London area. It has taken more than five years work before developments 100 km from London have finally been embarked on. there has not however, been a complete break in the former policy, the organisation of the development corporations and the medthos of financing the new towns, both instituted by the New Towns Act have remained the cornerstones of later development.

2.4 CHANGING GOALS IN DESIGN

The Milton Keynes example :

Goals set for the planning of the new city of Milton Keynes.

These were reached by a series of seninara and discussions extending over three months and preceeded all design work on the plan. the goals were :

1. Opportunity and freedom of choice.

2. Easy movement and access, good communications.
3. Balance and variety.
4. An attractive city
5. Public awareness and participation
6. Efficient and imaginative use of resources

Designing to meet new goals - Milton Keynes

The development of a master plan for a new city is a complex and difficult task. It involves the interaction of many approaches and arguments, symbolised by a team of 20 to 30 professionals from a very wide range of disciplines.

1. Land use and transportation patterns
2. Public transport and roads
3. Nodes as activity centres
4. Visual character

2.4.1 Landuse and Transportation Patterns

Milton Keynes has been designed as a city of 250,000 inhabitants. Its area is 22,000 acres, roughly square in shape and something over five miles across. Its size, shape and density define the problems of land use and transportation. Size and shape are determined by the designation, but density is a question of policy.

As a first step, five comparative urban forms were compared. Each showed a different decomposition of employment ranging from complete concentration to a fairly

general dispersal. This comparison showed dispersal of employment to be most inconvenient, equalled only by complete concentration of all employment at the centre.

The landuse plan for Milton Keynes accordingly shows a wide distribution of employment and service centres, which assists in providing variety and freedom of choice.

2.4.2 Public Transport and Roads

The goal of free choice in mode of transport was taken as starting point. This means that it is assumed that no deliberate steps are taken to prevent the use of cars either by designing for road congestion or by restricting parking.

A typical journey to work by bus in Milton Keynes is shown to take about 25 minutes. The service would run on all main roads, giving penetration to all parts of the city. Thus, so far as public transport is concerned, the goal of high accessibility every where seems attainable.

2.4.3 Nodes as Activity Centres

The goals of choice and opportunity are reflected in the location of activity centres at Milton Keynes. Instead of being placed in the centres of defined neighbourhoods, these are placed round the edges of residential groupings, at communication nodes. They are found at the point where the bus stops, and where pedestrian routes cross, over and under main roads. They thus serve two or more neighbouring groups of homes.

2.4.4 Visual Character

Except in a few exceptions such as the city centre there will more emphasis on open and grass than on solid buildings. (This does not necessarily mean lack of urban character as the college area at Cambridge shows. As you drive along a main road your view will alternate between part land and buildings, as local activity centres are passed.

This means that the quality of land scape design will have a critical influence. Perhaps even more than architectural quality, landscape quality will determine the impact of the new city.

2.5 BANGKOK - CASE STUDY

2.5.1 A Brief History

In 1782, King Chakri (Romal) moved the Capital, for strategic reasons, from Thanburi on the western side of the Chao Phraya River to the eastern side of Bangkok. Situated on the eastern side of a large loop in the river, the new site was better protected from military attack by a swampy plain to the east as well as by the river Liseir. The site also provided access to the sea and water to build a system of canals (Klangs), which become Bangkok's principal means of transportation and drainage.

2.5.2 Population

In the 1860s during the region of King Rama IV the population of the city rose to about 40,000 as Bangkok became an important commercial centre and point of contact with the west. The city's outward expansion along the main highways began thereafter.

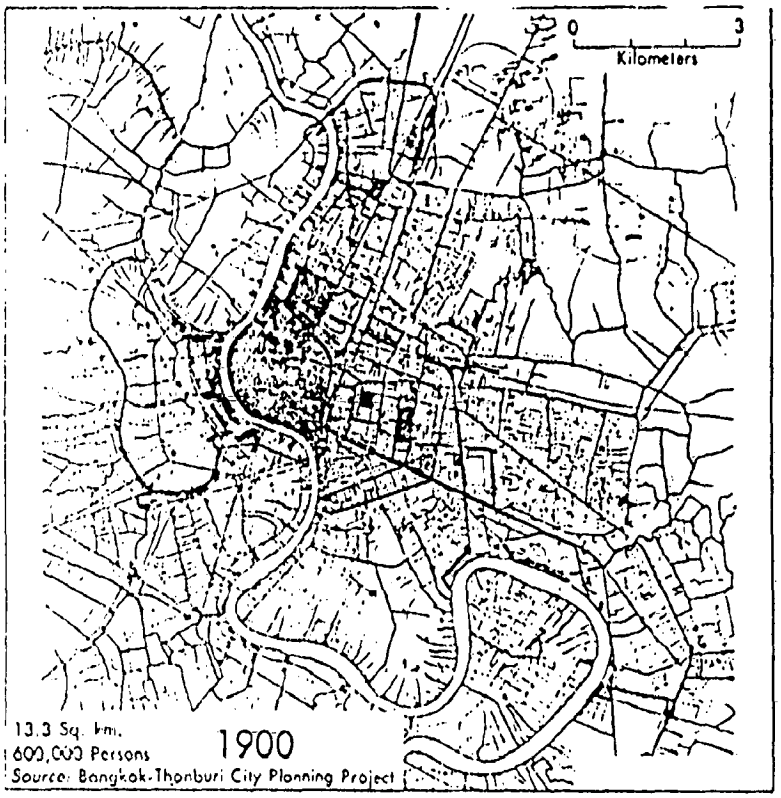
By the early 1950s, Bangkok's population had reached one million. The present population is more than five million in 330 sq.km. area. Now part of the metropolitan Bangkok extends into the adjoining provinces of Nanthaburi, Somut Prakarm and Samut Sakhan. However, Bangkok has not experienced overwhelming influxes of immigrants from rural areas.

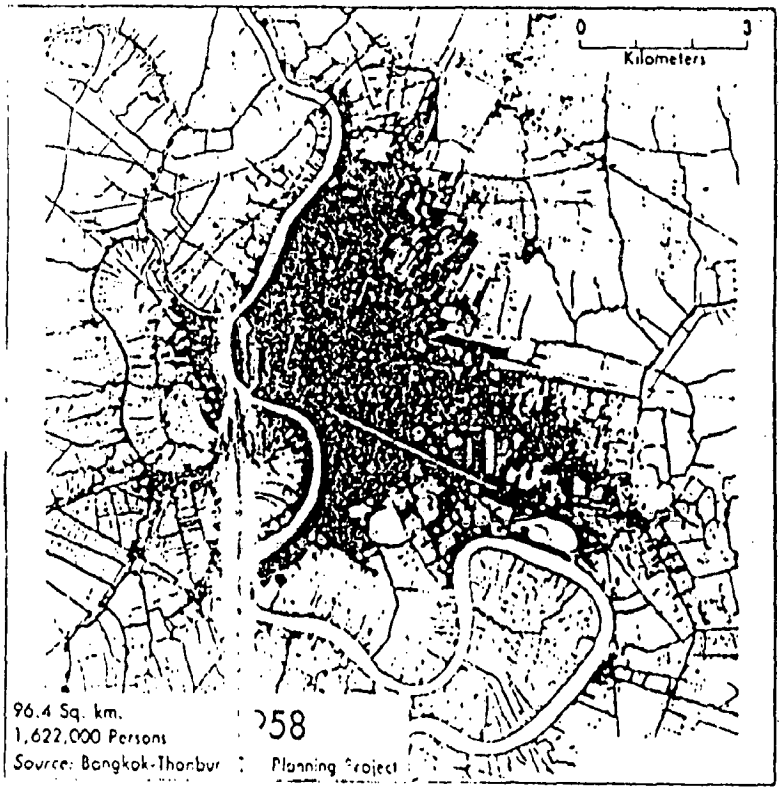
Residential and commercial development is highly intermixed, lying generally to the east of the river. Although, Thanburi on the west bank has potential for growth, only three bridges connects the both sides of the river.

2.5.3 Urban Situation

Urban situation in Bangkok is very grave. About one third of the population has been access to public water, the city suffers from periodic clogging. In addition, there is no central sewage system. Space devoted to roadways accounts for less than 10% of the city area and consists of

GROWTH OF BANGKOK





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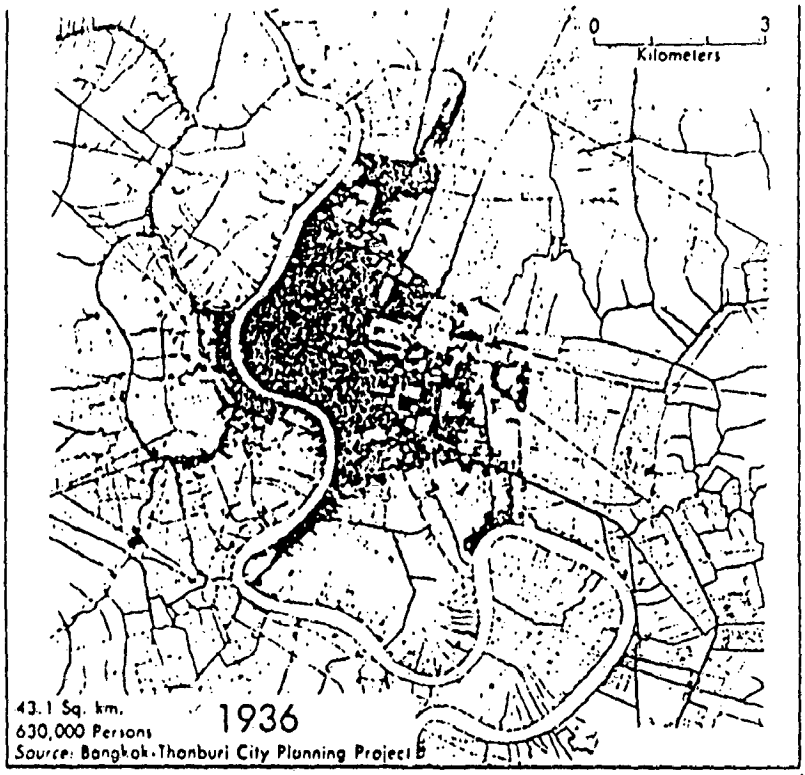
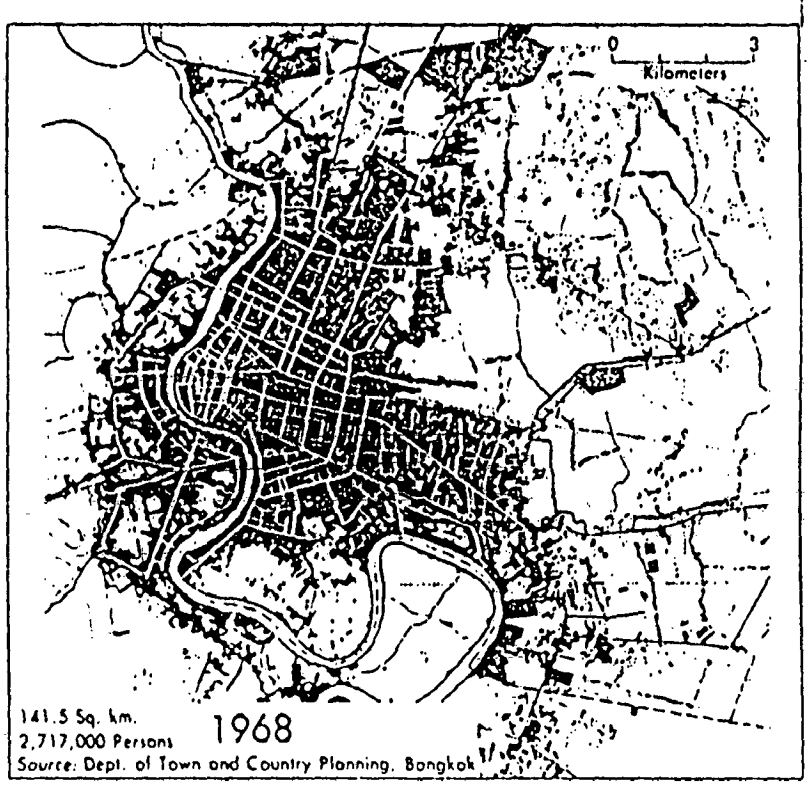
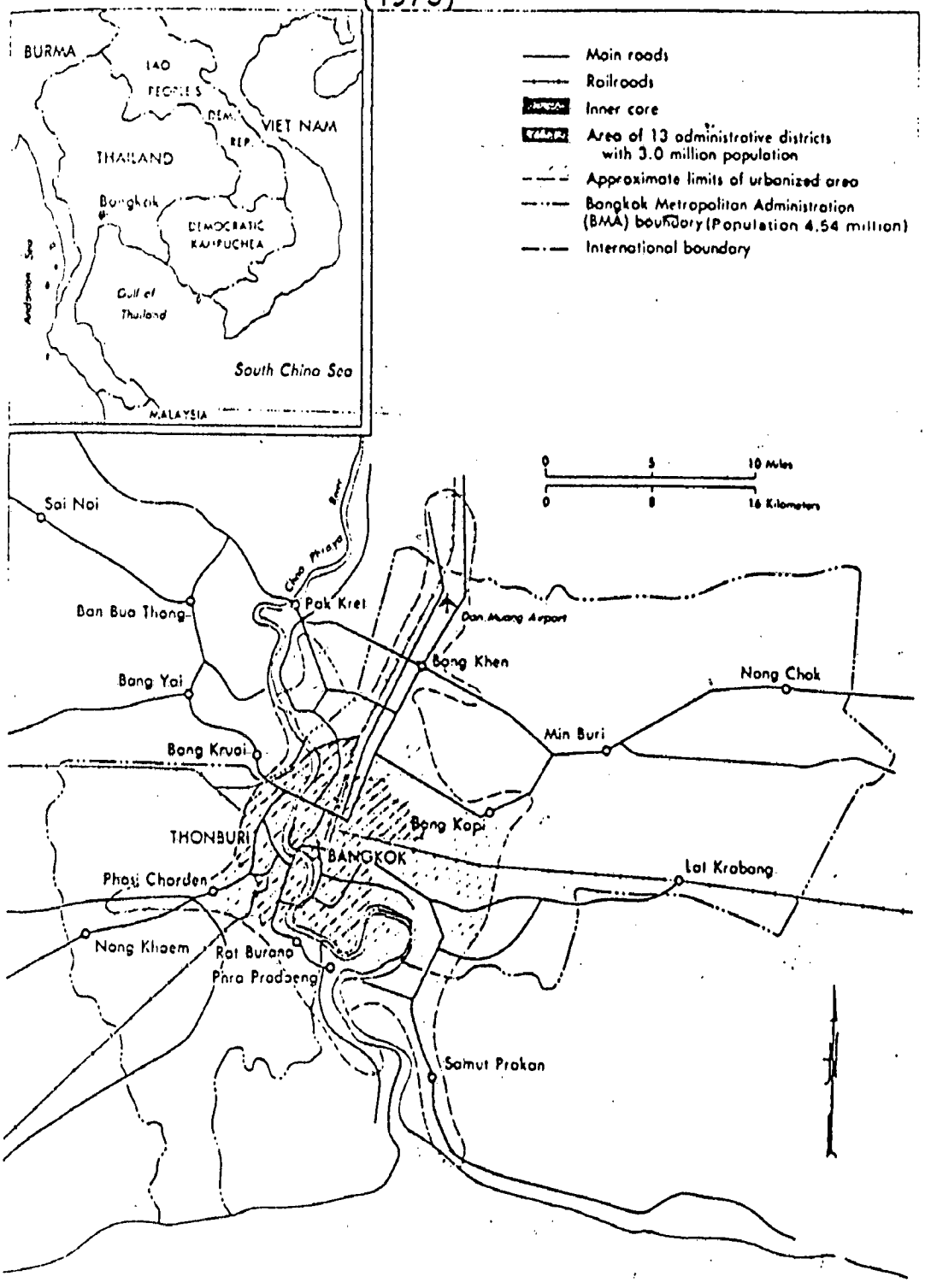




METROPOLITAN BANGKOK

(1975)



SOURCE SIVARAMAKRISNAN-GREEN, 1986

very few main roads and resulted to serious traffic congestion. There is an acute shortage of housing one quarter of Bangkok's population which lives in slums with inadequate service facilities.

2.5.4 Expansion of the City

Initially, Bangkok responded to this problem with physical planning. Three master plans for Bangkok have been prepared during the past twenty years, but all have suffered from a preoccupation with landuse planning and control, and none has been followed consistently. In these plan development of self contained satellite towns has been emphasised. The satellite towns which have come up are Lat Krabang, an industrial estate 35 km east of Bangkok, Nave Nakorn 50 km north and Bang Phli, 40 km south east of Bangkok. These towns have helped to alleviate the pressure of central city to some extent.

Ribbon development is taking place along the main transportation links due to lack of control. Apart from this, landuse in the satellite towns are not properly controlled. It is feared that the satellites might eventually lose their separate identities within a single congested connurbation.

2.6 INFERENCE FROM THE CASE STUDIES

(a) For decentralizing the congested central city, the

expanded or satellite towns need efficient and ample public transportation system.

(b) The new towns are to be self contained and offer enough employment even in the future.

(c) A regular monitoring for implementation and subsequent planning is needed to the growth of expansion towards the desirable direction.

(d) Basic and non basic employment to be allotted in the existing city as well as the new towns in right manner to get a balanced growth.

(e) Proper development control to be there along the transport coridor between the satellite towns and central city.

(f) Advanced planning is required to avoid the back logging.

(g) The expansion plan to be considered in the regional context.

CHAPTER 3

CHAPTER - 3

CALCUTTA : THE EXISTING SITUATION

(DATA COLLECTION)

3.1 THE CITY IN HISTORY AND ITS GROWTH

On the 24th day of August 1690, Job Chernok (Founder of Calcutta), an East India Company agent, moved his boats off Sutanati, on the east bank of the river Hooghly. (The Ganges. It is situated on the natural level of the river at the latitude 22°33'47" North and longitude 88°23'34" East).

In 1698, the Englishman gained Azim-Ur-Shan's favour of obtaining permission to purchase the villages of Sutanati Kalikata and Gabindapur from the land ownders. The growing importance of the colony promoted the company in 1707 to declare Calcutta a separate presidency, accountable to the Directors in London of the East India Company in 1717, the company obtained permission from the Moghal Empire to purchase thirty eight villages extending down both sides of the Hooghly on a stretch of 16 kms distance.

A plan on the territory of Calcutta in 1742 from a drawing of Ms Forresta and Dllifers, shows the area as a kind fenced city around a fort, which was the town for whites only. The European town was built up with proper road and sanitation, street lights and open spaces, while in the northern fringe, the balck town was growing rapidly and

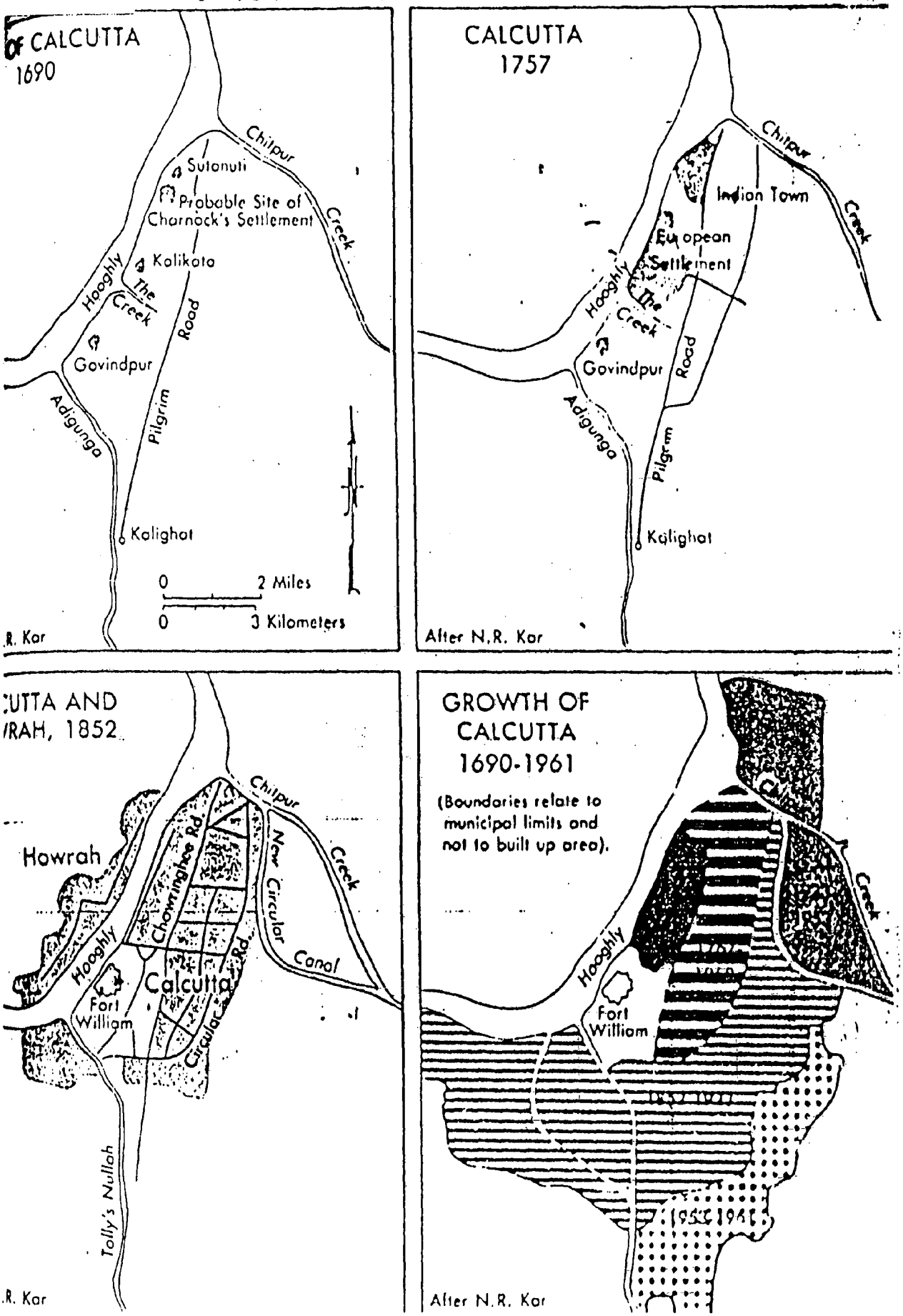
congesting the area in a very unhealthy manner. There was no senitation system or street lights. Ponds were digged up here and threre. It looks as all the houses and been thrown up in the air, and fallen down again by accident as they now stand (Mrs Natharial Kindersley's latter June 1768).

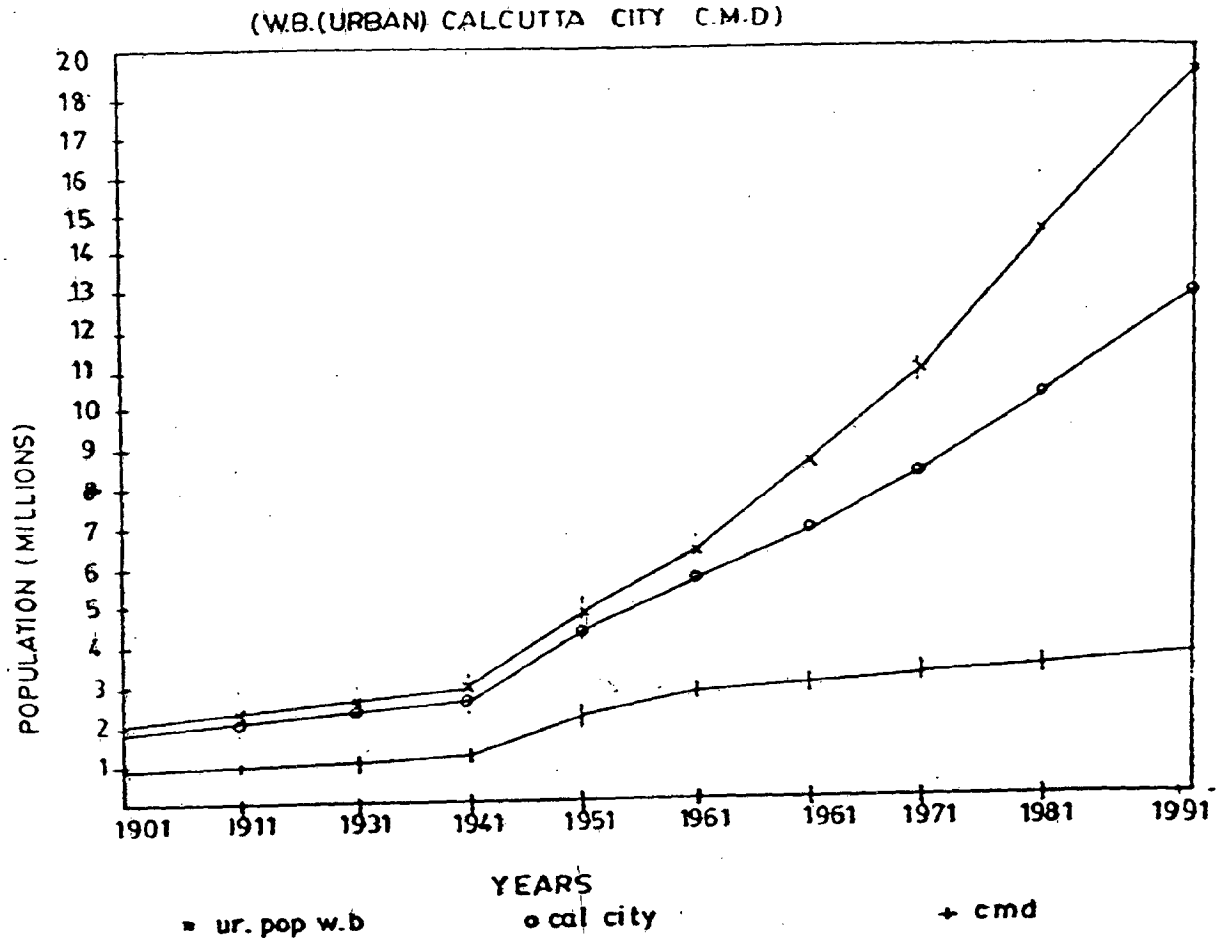
In 1773, the present Fort William was completed. Britishers settled in the southern side of the Fort Chowringhee area. In 1774, Calcutta officially became the capital of the British Empire in India. Though the British quarter of the city was overwhelming in its architecture and beauty, the native quarter remained hapazard, unhygienic and dirty.

Calcutta Improvement Trust (CIT) was formed for the improvement of the city in 1912. The economic base of the region started to shift rapidly from the agriculture and cottage trade to industry and manufacturing industries and bustees growth of manufacturing industries and bustess (slums increased to a considerable extent).

Calcutta received the most griavious injury through the partition of Bengal in 1947, when it not only lost one of the richest agricultural hinterlands Cre Bangladesh, but was also burdened with an unprecedented influx of refugee families. By 1951, about 1.5 million refugees from East Pakistan had settled in greater Calcutta area.

GROWTH OF CALCUTTA





POPULATION GROWTH

During 1940-80, the metropolis doubled its population by adding more than four million people but it hardly received any investment for its infrastructure, improvement and segmentation.

Calcutta has now become one of the most densely populated cities of the world with a most complex and contradictory pattern of urban uses. It has been experiencing chronic deficit in basic utilities, facilities, transportation system and vast housing shortage and proliferating slum areas.

3.2 A DEMOGRAPHIC PROFILE

The crucial demographic fact about Calcutta is that it is the primative city of a vast hinterland (unconfirming town adjoining status) which is the least urbanised of all major regions in India (only 14.3% living in urban areas). Its magnetic attraction for migrants in search for employment is unrivalled by any other urban centres in India. As the city grew and prospered, its urban services have failed to cop with the unrelieved population pressure.

3.3 GROWTH OF POPULATION

During 1921-76, the CMD population has become four times bigger while Calcutta trebled in population. In the thirty years between 1931 and 1960 Calcutta city grew by 140% and CMD by 160%.

3.4 MIGRATION

A very substantial proportion 30% of the 1951-61 population growth within the Calcutta Metropolitan District has been due to a continued inflow of migrants.

Two main streams of migrants have contributed to the flow :

1. More than 50% of the workers in CMD are from other states. So long as the marked disparity continues in the economic situation of CMD and its hinterland, migration on to Calcutta from areas of relatively poor is likely to remains one of the dominant factors in the metropolitan population growth.

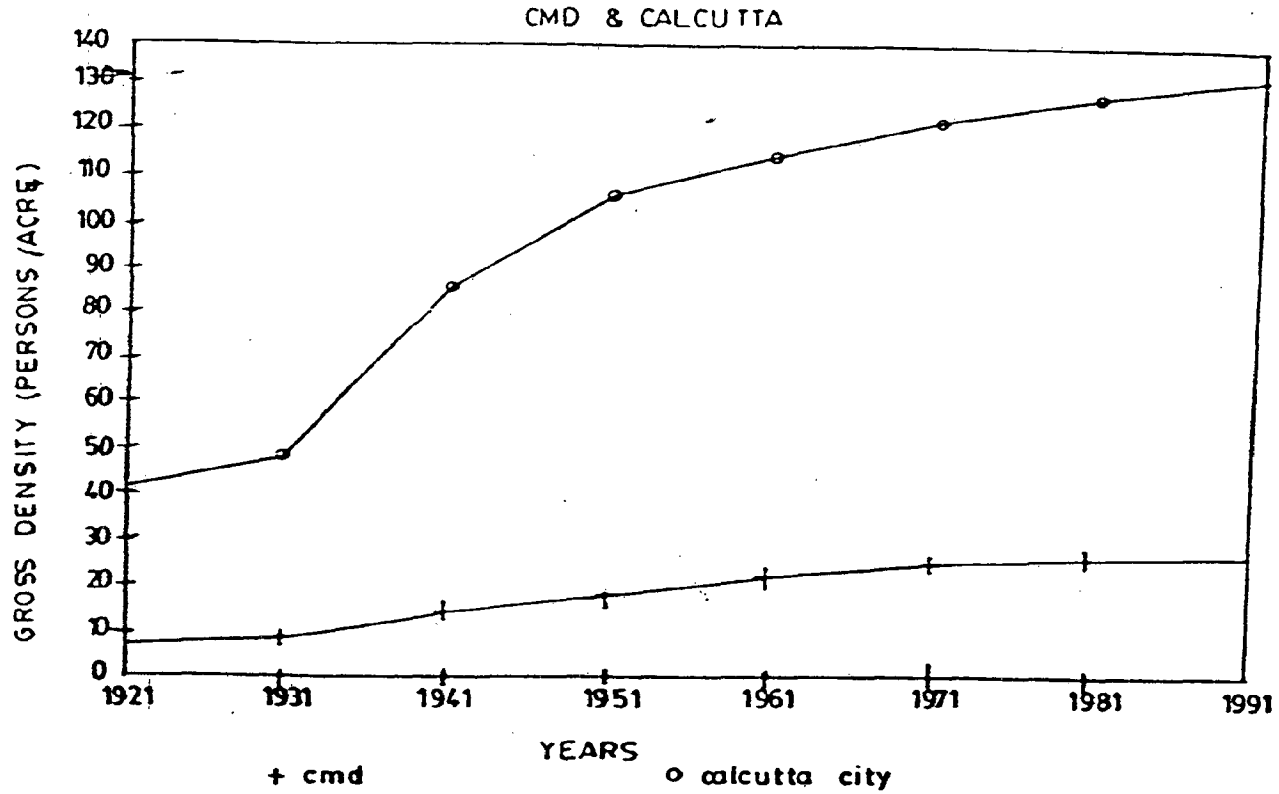
2. Refugees : Until 1971, due to political insecurity, nearly 6 million refugees have come over to West Bengal, in different waves. Calcutta's refugees population constitutes about 28% of the metropolitan population.

3.5 STRUCTURE OF POPULATION

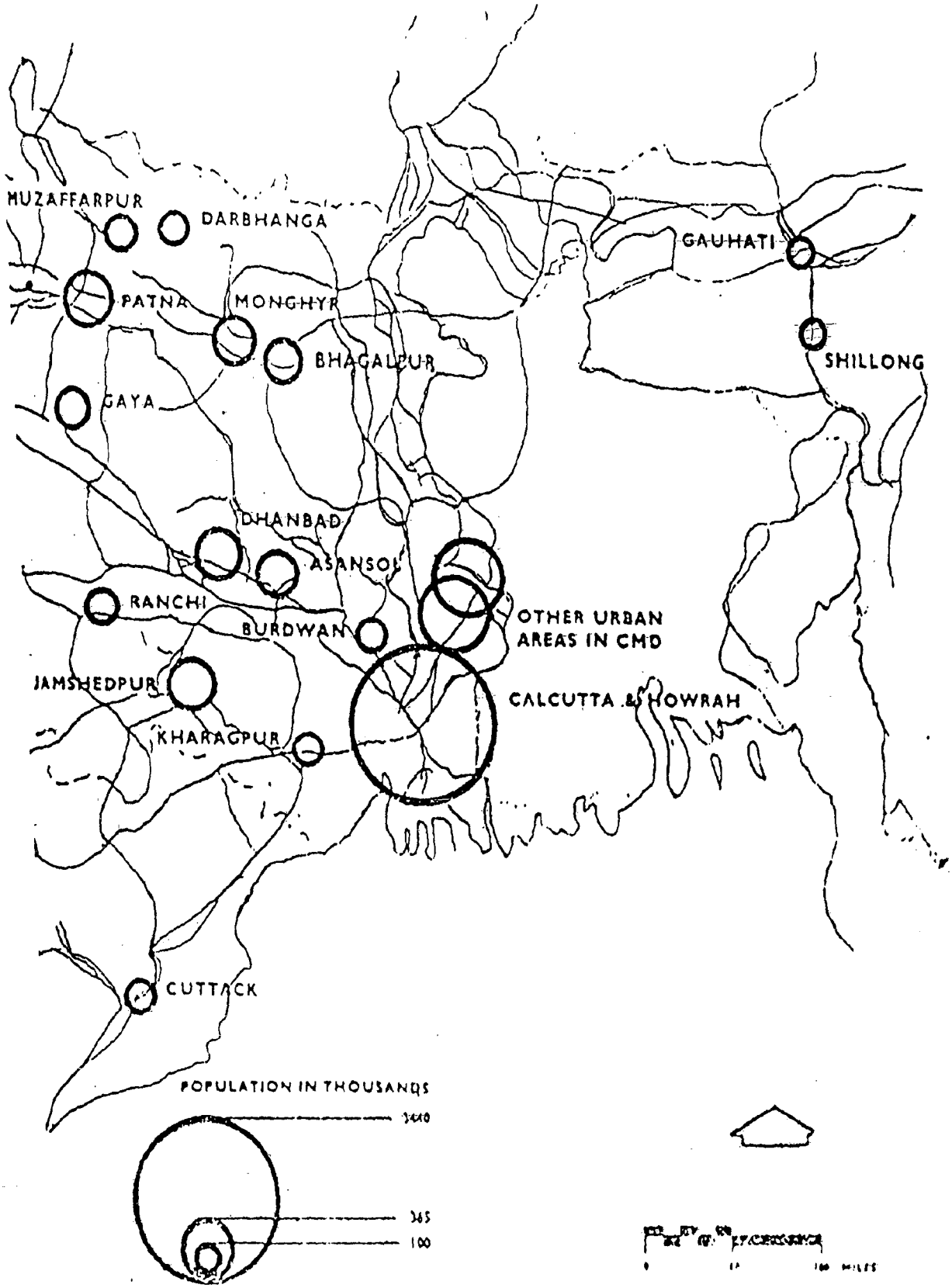
Ratio of male to female 60 to 40 is due to the male migrants who have come to the city for work, having left their women behind.

3.6 INCOME PATTERN

In 1981, 39.68% of the Calcutta proper's population



DENSITY VARIATION



OR CITIES AND TOWNS IN THE
R-STATE REGION

were living in very congested and insanitary slums or bustees. Apart from this 2,00,000 pavement dwellers were estimated within Calcutta proper.

The above situation has also reflected in the income distribution of the population.

The income pattern of a soceity also directly reflected to the affordability for housing and its behaviour pattern.

3.6.1 Income Distribution in CMD, 1981

Economic Level	Monthly Income for Families in Rupees	Percentage of Total House	Cumulative Percentage
EWS 1 & 2	150	20	20
EWS 3	151-200	11	31
EWS 4	201-350	30	61
LIG	351-600	21	82
MIG 1	601-1000	11	93
MIG 2	1001-1500	4	97
HIG	Above 1500	3	100

3.7 HOUSING CONDITIONS

Approximate estimates, whether made by the United Nations or different organisations like CMPO, etc. suggest

that between 50,000 to 80,000 housing unit per year for 20 years would be needed to meet the backlog and the demand by natural growth.

HOUSING CONDITION IN CALCUTTA 1981

Unit	% of H.H.	% of POP occupying	Average no. of persons
1 Room	67.6	54.7	4.46
2 Room	17.2	20.1	3.21
3 Room	8.1	11.3	2.57
4 Room	3.7	6.4	2.34
5 Room or above	3.3	7.5	1.79
Unspecified	0.1	-	-
All sizes	100	100	100

The densities in metropolitan Calcutta are 39,850 persons per developed sqm and 72,600 persons per residential sq.km. It varies from 7410 person per residential sq.km. (Tangra town) to 3,96,400 persons per sq.km. (Barabazar area).

The most rapid population growth over 1951-61 decade occured in the municipalities immediately north and south of Calcutta Corporation area. The suburbs closest to Calcutta. North and South Dumdum, Kamarhati, Paihati, Garden Reach and South Suburban, have almost over night became substantial

communities, within the city itself, the fastest growth has acrued in the low lying, unserved, poorly drained lands in Tangra, Tapsia and Kasba area along the eastern fringe in the wards of Tollygaunge in extreme south.

3.8 URBANISATION AND THE CITY

Inspite of that Calcutta has now become one of the most complex and contradictory pattern of urban uses. Calcutta is connected with the Western side of the Ganga and most of the country with only one bridge the Howrah bridge, at present. So approaching to the CBO from western side result very high congection at both sides of the bridges. Apart from this, in Calcutta proper only 6% of the total area is carriage way, which is responsible for slow traffic movement (average speed of the vehicle 12 km/h) in the city.

3.9. GOVERNMENT POLICIES

The Government under D. Bidhan Chandra Roy suggested the development of the city eastward along the marshy Salt Lake by reclaiming the land. Priority has been given to land in already built up sectons which is under utilised. The type of infilling housing programme has been started recently. At the same time about 30 km north of Calcutta Kalyani township was developed to give relief to Calcutta. To discourage the industries within Calcutta a new industrial township at Durgapur within was initiated much away from the conurbation. At North Bengal Farakka Project

was also started, which might trickle down its effects to its surrounding. The whole programme had a regional outlook to give a balance between push and pull.

By 1962 CMPO prepared the Basic Development Plan with the aim to arrest further deterioration of the physical infrastrucutres. In 1970 another development authority Calcutta Metropolitan Development Authority (CMDA) was established. The metropolital concept strongly advocated in BDP, but its mandate combined the functions of planning, programming, financing and implementation. With emphasis on tackling a variety of sectoral projects through the existing structure of state and local agencies. After CMPO had been abolished in 1977, CMDA is the main development authority and in 1980, autonomy has given to them to function more properly and strongly.

CHAPTER 4

CHAPTER - 4

INTENTION OF SALT LAKE

4.1 BACKGROUND OF SALT LAKE

The Salt Lake Reclamation Scheme had been with Government for a long time, longer perhaps than Farakkah or Digha Kalyani, Frasergunj or this Satellite Town. The first recordeded dream was in 1830. In 1855, first reclamation authority was established by dumping rubbishes. The Justice of Peace occupied a part of it, and in its was known in the document as 'square mile'. But very soon the project was abondaned.

Evidently, Salt lake is a part of Gangetic Delta formation process, i.e., raising of land through natural process of sedimentation did not reach its culmination here, due to natural as well as man made causes. Right from the sixteenth century the Ganga displayed a dedinite tendency to flow further eastward gradually, leaving the Bhagirath and other channels high and dry most of the year. As a result the benefidient activity raising the delta by the repland flood carrier got a major set back. The tidal channels remained the only agency which could raise the delta and make it fit for human habitation. However, craving for land compelled men to go out for fresh pastures and the marishes, still undergoing natural reclamation through deposition from tidal channels were found to be easiest target.

Within a short time marginal embankments were thrown along the banks of the tidal channels and large areas of land were reclaimed prematurely. As a consequence, benefit of raising of low land from tidal channels was also completely lost to a large area. The Bidyadhari river which had been serving this area as a drainage channel had also taken part in delta building. However, due to early reclamation and introduction of a large number of fisheries in the area, free tidal spill had been arrested and the Bidyadhari river deteriorated very fast. Finally, the ; Kristopur canal (1910) by cutting of a good portion of the Salt lake spill area (Ghunj, Jalragachi - about 18 sq.miles) and interfering with a natural drainage from the north sounded knell of the Bidyandhari river. Since then fresh draiange lines for drainage of Calcutta had to be found out and meanwhile the Salt Lake continued to remain a sore point near the city of places as a remnant of neglect both by natural and human factor. In 1943, a report by the Gurner Committee proposed the phased filling of the area over a time periof of twenty years.

Then again in 1953, a plan was prepared by consultants from Netherlands who came in India at the invitation of the government of West Bengal. The plan proposed for a city extension of 9.7 sq.km. along with intensive development of agriculture horticulture and fisheries in the other part of Salt Lakes.

4.2 THE GOVERNMENT'S PROPOSALS

During the period, the city of Calcutta was growing very fast. Being sandwiched by the Hooghly river on the west and the Salt Lakes and other low lying areas on the east, the city got cramped.

In 1950s Government seriously started thinking about filling the eastern low land of the city to overcome the initial threshold for eastward expansion of the city of Calcutta. The necessity of land fill in most locations makes the development of small sites very costly. With a large scale development, significant economics could be realised. But the land filling of the entire Salt Lake of an area 4650 acres of land involves a large amount of money resources, so it was divided into two parts - northern and southern Salt Lake. Around 3,800 acres land was taken into consideration for building up the new township in the first phase.

The major objectives of the plan, as it appeared in Calcutta Gazette in 15th February 1956 are as follows :

(1) To set up a self contained lower middle income residential township for about 2.5 lakhs populations.

(2) To help relieve living congestion in Calcutta.

(3) To provide a full range community facilities and ammenities including underground sewage disposal,

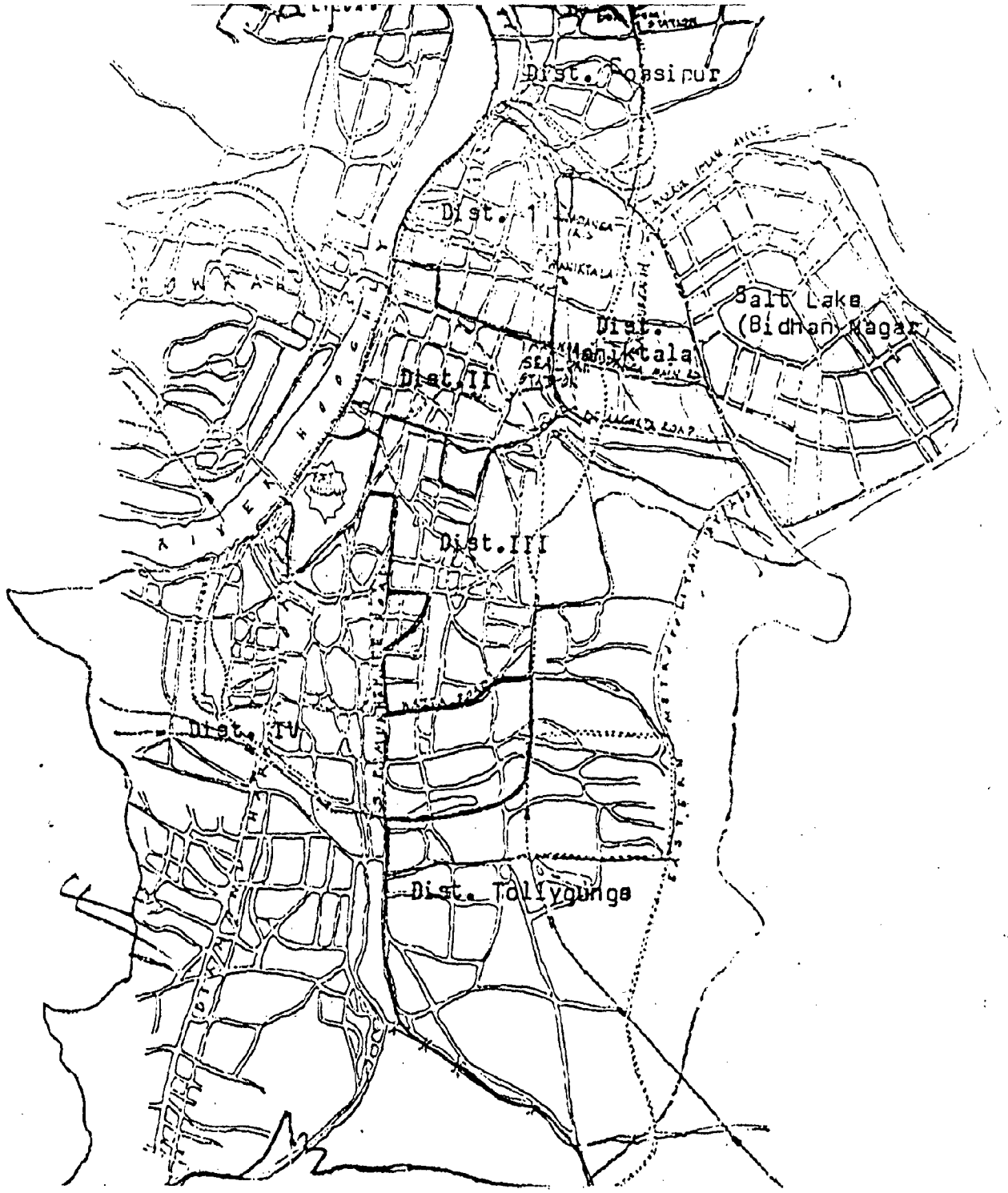
water supply, electric supply, roads, parks and schools and markets etc.

Under this objective headings initial plans and proposals for Salt lake were prepared.

4.3 CONSULTANCY FOR DEVELOPMENT

The Dutch people of Netherlands are experts in extending the city into the Ocean. Dr. B.C. Roy sought their help when he found that Calcutta could not be extended because of the marshy Salt Lake on the east. West brook and Schijt of the Netherlands Engineering Company 1953-1954 recommended the reclamation of northern Salt Lake for 'New Calcutta' - the name given at that time, and the plan known as NEDCO plan. The Yugoslav firm invest import who had similar experience in Zegreb was asked to start the engineering work. Dobrovoja Tskovic, young architect - plannar of Ivan Milutinovic, the Enterprise for Jaterways, Belgrade prepared the Master Plan and detail project reports by 1964.

In 1960, the Government of West Bengal created the Salt Lake reclamation and development board, under the Irrigation Department which was responsible for undertaking certain works for the reclamation and development of the Salt Lakes near Calcutta and other adjoining areas. The development of Salt Lake Township under these terms of


Dist. Barasipur
Dist. I
Salt Lake
(Bidhan Nagar)
Dist.
Manicktala
Dist.II
Dist.III
Dist. IV
Dist. Tollygunge

reference became a major project of Irrigation Department and it remained so, even after the reclamation work was over.

In the meantime, Calcutta Metropolitan Planning Organisation (CMPO) had come up to prepare a development plan for entire Calcutta region. But their role was advisory only. CMPO prepared a detailed housing scheme for the entire Salt Lake Township with respect to Calcutta, CMPO was askes to suggest on the development plan particularly, for the sector III, IV and V of Salt Lake Township. But ultimately hardly any suggestion has accepted from C.M.P.O.

At present, C.M.D.A. plays the advisory role to the Salt Lake Development Authority (SDA), which functions under the Metropolitan Development Department and Irrigation Department of other Government of West Bengal.

4.4 PLANS AND PROPOSALS OF THE CONSULTANTS

There were two proposals for the process of reclaiming the Salt Lake - one was the inexpensive, but risky poldering system by encircling the area with high dykes and drainage by pumping and the second was the hydraulic filling of the swamp by the dredged silt slurry of the Hooghly River bed. The hydraulic principle was accepted as the dredging was essential for the navigability of the river.

Yugoslov planner Tosxovic designed the diamond shaped Salt lake with a central park, school or market. Each block was again sub divided into sub-blocks with children's park and small square where no throughfare would be permitted. there were 49 residential blocks in his design.

The Yugoslov architect designed blocks for different land uses administrative and social centres and trade and commercial complex, hospital block, industrial area and sports centre. The internal and external transportation networks were suggested. Toskovic recommended more appartments and designed some blocks with mixture of different house types and apartments.

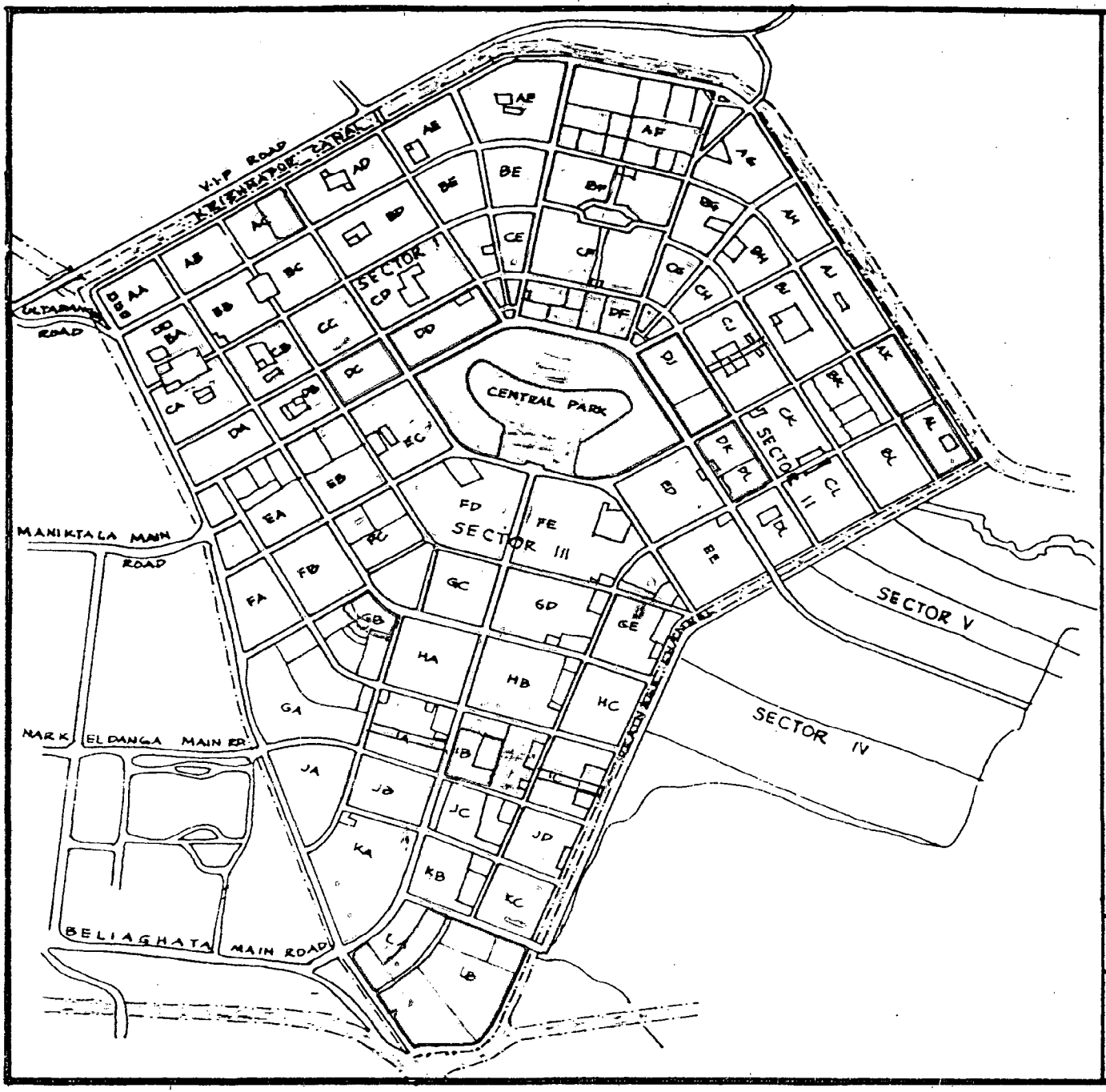
4.5 THE STRUCTURAL FORM OF THE CITY

The structural forms of the city is divided into :

(a) Basic types of units, i.e. neighbourhood units - which consist of blocks intended for habitation, as a basic organisational form of habitation in the structure of the city with its local centres.

(b) Zone type units - which comprises centres intended to satisfy greater requirements of the inhabitants of zone of several neighbourhood units - (commerical and business centres of individual zones).

(c) General city type unit - which comprises the city centres intended to satisfy the requirements of the



LEGEND

- LOW RESIDENTIAL
- HIGH RESIDENTIAL
- GOVT. OFFICES
- ADMINISTRATION
- TRADE & COMMERCE
- INDUSTRY
- MAIN GREENERY
- HOSPITAL
- SPECIAL USES
- ROADS

ORIGINAL LANDUSE MAP
(TOSKOVIC'S DESIGN)

SALT LAKE (BIDHAN NAGAR)

CALCUTTA

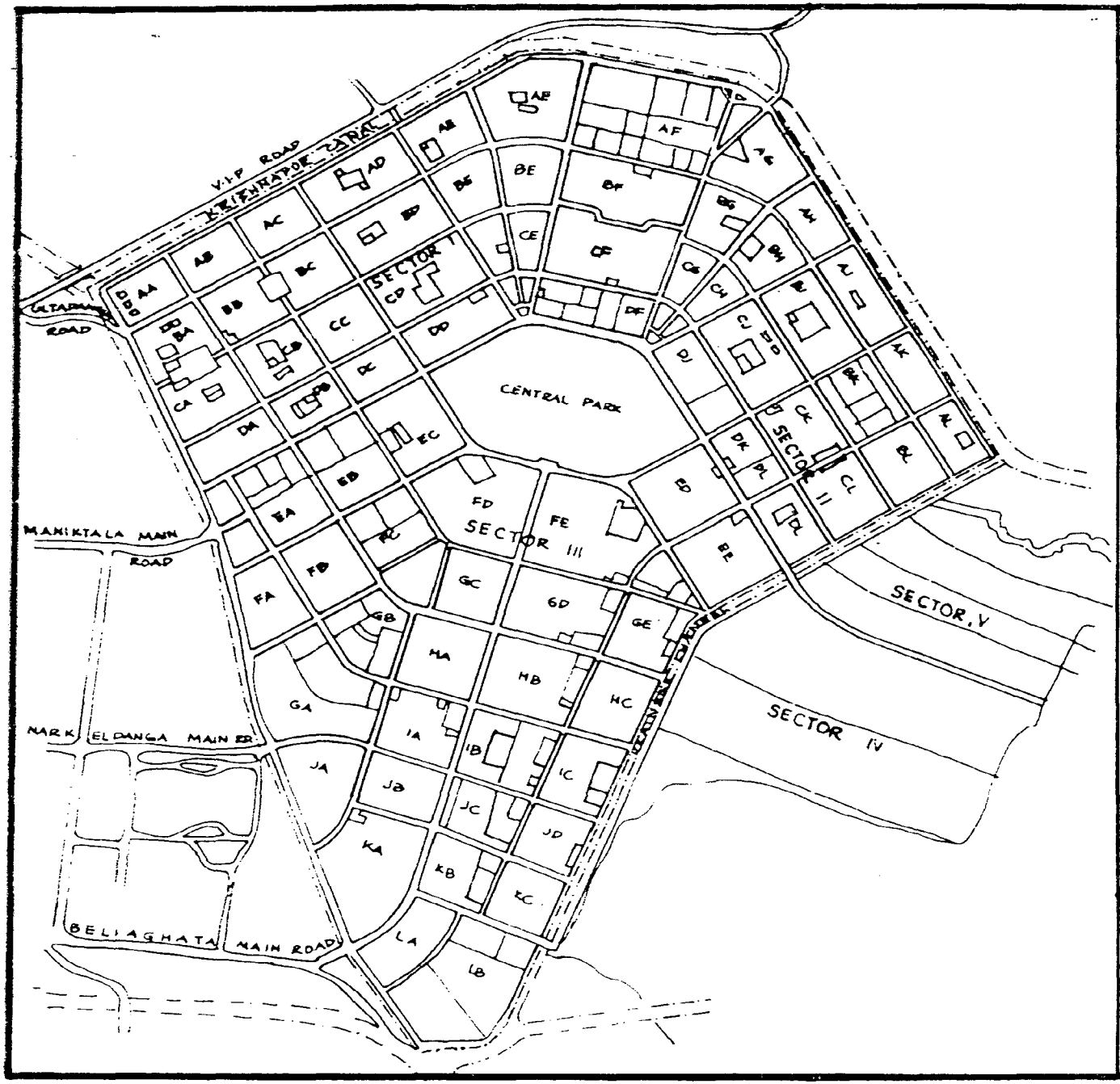
whole township (Government Centre, Administrative and public centres, city park, hospital complex, university centre, industry, recreation).

Toskovic D : New Calcutta Salt Lake Township

The density of the population as proposed in the plan was 350-400 pph (gross residential density near the central park, due to proximity of the city centre and main traffic lines. In other areas the density was estimated between 240-800 pph depending on the type and number of units.

Toskovic suggested most of the appartments to be between 4 to 7 floors, which he though economic in view of technical and other installations utiliztion. The heterogeneous construction had suggested on asthetic point of view.

Since 90% of then Calcutta's household populations income was below Rs. 700 per month, Toskovic suggested more flats with 2½ rooms and 3½ rooms.



LEGEND

- RESIDENTIAL
- PUB. UTILITIES & INSTITUTIONAL
- GOVT. FUNCTIONS
- TRADE & COMMERCE
- ORGANIZED OPEN SPACE
- RECREATIONAL
- SPORTS COMPLEX
- INDUSTRIAL
- ACTIVITY SPINE
- TRANSPORT
- ROADS
- DEFENCE

SALT LAKE (BIDHAN NAGAR)

CALCUTTA

CHAPTER - 5

IMPLEMENTATION OF THE PLAN

The site laden slurry from the depths of the Hooghly river was used to fillup the marshes of the Salt Lake. Sand was dredged from the Hooghly river at the Ghusuri Shoal (located between Howrah bridge and Dakshineshwar bridge).

5.1 LAND RECLAMATION AND LAND DEVELOPMENT

5.1.1 Land Acquisition

On 19th May 1956 under the Governor of West Bengal's stamp, the Land Acquizition Notice for Salt Lake came out in Calcutta Gazette under the Land Acquisition Act 1894 (1) section 4. The places mentioned under this notification were Haldia, Bargur, Chanvagha, Nonadanya, Dhapa, Kalikapur, Santoshpur, Nayabad, karimpur, Jagtipota, Mukandapur, Pargachia, Tentulbasi, pant Chpota of Monga Kestapur, District 24 Parganas. But due to litigation, out of 15 sq.km. of area notified, 12.35 sq.km. were acquired by 1962.

5.1.2 Land Reclamation

Finally on the 16th April 1962, Dr. B.C. Roy, the Hon. Chief Minister of West Bengal inaugurated the project and silt laden slurry from the depth of Hooghly started filling up the marshes. Sand was dredged from the Hooghly river at the Ghsuri Dhool (lying between Howrah bridge and Dakshineshwar bridge) and brought to deposit at the salt

lake through a five mile long pipe line through Bagbazar canal and Kestopur canal. A cutter suction dredger stationed on the river itself, dredged the Matinal from the Shoal and directly loaded into the waiting barges. During storage in the barges the heavier sand particles settled down and the lighter suspended particles of silt were eliminated with the spillage. The loaded barges were pushed by Fug Boards to the reclamation dredges which was in fact a floating pumping station. The sand was them mixed with water in the ratio of 1:7 by weight and the resulting slurry was pumped through a 24" dia (0.6 m) pipeline to the reclamation site,at salt lake at a velocity of about 11 feet (3.35 m) per second.

Meanwhile, the reclamation area had been divided into a number of pockets by putting embankments on a grid. The delivery pipeline had two booster stations to maintain the pressure for smooth delivery. In the pockets sand settled down and got deposited at the bottom leaving the water at the top, which was drained out by gravity. Filling was done in stages in different block or pockets.

Sector I was completed during 1965 and by 1969, the filling up process of Sector II and III was completed. Sector IV and V were completed by 1978, after the land was acquired after litigation. The whole area has been filled upto a depth of about 7.5 feet or (2.25 m) on an average. The total area reclaimed so far is about 15 sq.km and the

reduced level of the surface through out salt lake is about 12 feet (3.66 m) PWD levels, which is about 3 feet (0.91 m) higher than average level in Calcutta.

Raising the level of the land was only a part of the job. The irrigation and water ways department who were responsible for the execution accepted the master plan and invested on road and infrastructure. In 1967, work on sewerage draiange, water supply system and road were taken up for Sector I. Gradually with the filling up of other sectors, these works were extended to them.

5.1.3 Disposals of Lands

It was decided to allot the plots to the consumers on lease basis, the Governor of the State of West Bengal is the 'Lesser' and the contract will be for 999 years. In the twenty points lease contract transfer of land was restricted.

But initially there was very low demand for lands in salt lake. So the Government had to withdraw these restrictions in 1971, and the lease contract deal was on the 17 points, instead of 20 points. But after 1972, All India Congress Session in Salt Lake, the demand for land in Salt Lake increased so the government again introduced its original 20 points base contract with the restriction on land transfer.

The first building in Sector I came up in 1969 and in Sector III in 1982.

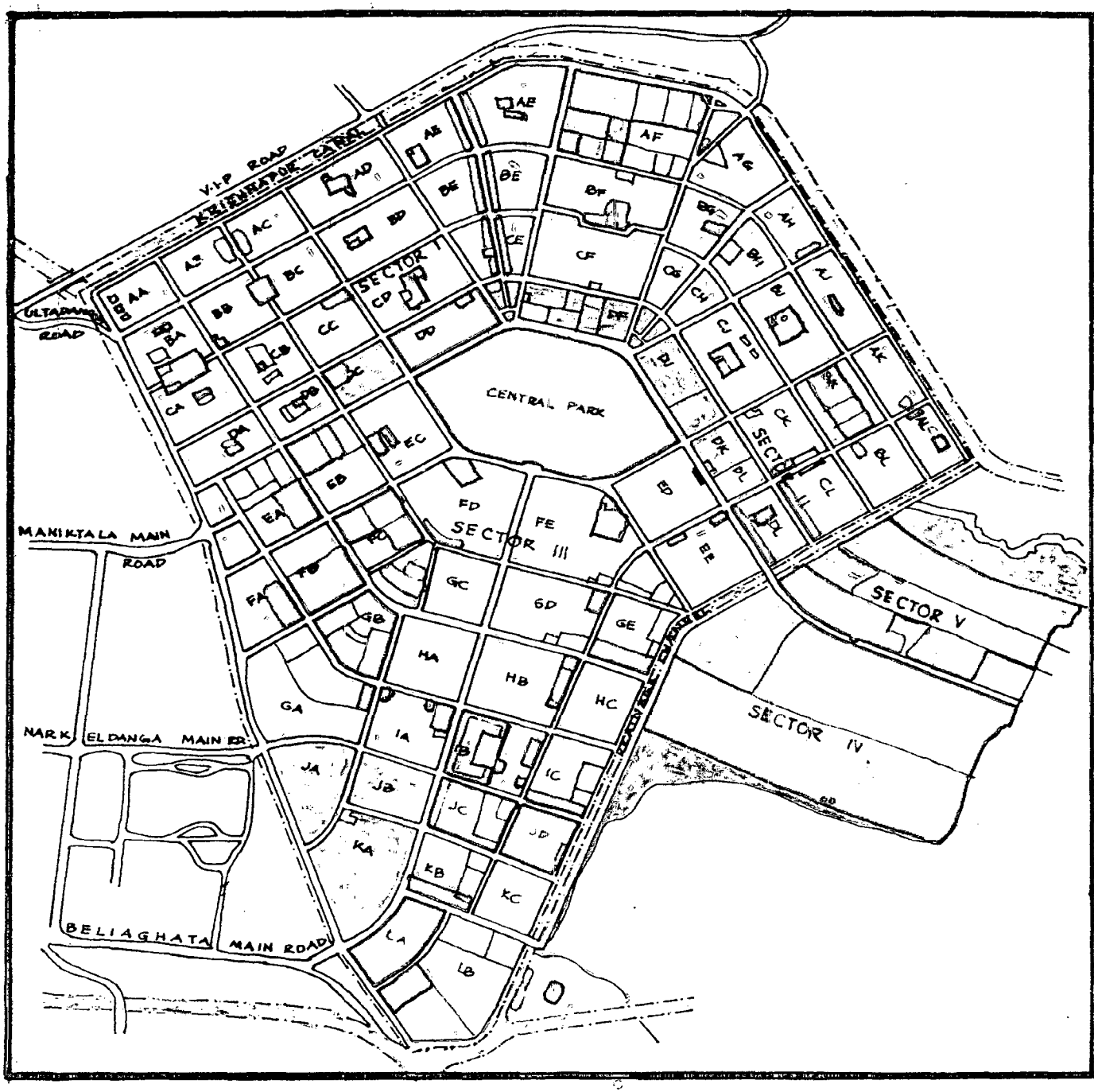
5.2 THE LAND USE

The Irrigation and Water Ways Department was more responsible for the execution, accepted the Master Plan and invested on road and infrastructure. But objections were raised against so many flats and community areas. Slowly the landuse plan was changed and more plots were created and many plots abutted main roads which was not in the original Master Plan.

The recent plan for Salt Lake is divided into five sectors on 15 sq.km. if area, compared to 12 sq.km. in the original plan. The plan incorporates a town centre including public and semi-public buildings and activities, to form the focus of the new community as it was in the original plan. The city level commercial centre has been agglomerated in two adjoining blocks near the central park instead of two separate blocks on both sides of the Central park (as it was in the original plan).

Surrounding the Town Centre in a generally symmetric pattern there are about 35 residential neighbourhoods of various sizes accommodated in three sectors.

A small portion of the total land (107 acres) in the northern part of the Salt Lake is proposed for the industry



LEGEND

- RESIDENTIAL
- PUB. UTILITIES & INSTITUTIONAL.
- GOVT. FUNCTIONS
- TRADE & COMMERCE
- ORGANIZED OPEN SPACE
- RECREATIONAL
- SPORTS COMPLEX
- INDUSTRIAL
- ACTIVITY SPINE
- TRANSPORT
- ROADS
- DEFENCE.

PROPOSED LAND USE MAP - 2001

SALT LAKE (BIDHAN NAGAR)

CALCUTTA

within residential sectors. 560 acres of Sector V has been allotted mainly for the industries with few housing areas for the residential workers and for them a small commercial area.

Out of 790 acres in Sector IV, 40 acres has been allotted to 'Jheel Meel', a recreational park and army housing estate are there.

The land use of salt lake at a glance are as follows :

LANDUSE PATTERN OF SALT LAKE

Landuse	Existing Proposed Plan 100% = 3865 Ac			Original Master Plan 100% = 2585.11 Ac		
Residential	50%	=	1932.5	51.56%	=	1332.88
Roads & car parks	23%	=	888.95	23.18%	=	599.23
Main Greenway	12.1%	=	467.67	12.20%	=	315.38
Education and Scientific	2.4%	=	92.76	2.56%	=	66.18
Govt. Amdn.Use	1.3%	=	50.25	1.33%	=	34.38
Social Use	1.9%	=	73.44	1.91%	=	49.37
Trade & Business	1.2%	=	36.38	1.20%	=	31.02
Industrial	3.4%	=	131.41	3.56%	=	92.03
Hospital	1.5%	=	57.98	1.59%	=	41.10
Cooperative Development	2.3%	=	88.90	-		-
For Special Use	0.9%	=	34.79	0.91	=	23.52

Source : Dr. M. Chatterjee, CMDA, Report No. 12.

The table shows the landuse break up has remained almost the same only the distribution has changed to a large extent.

5.3 FACILITIES AND SERVICES

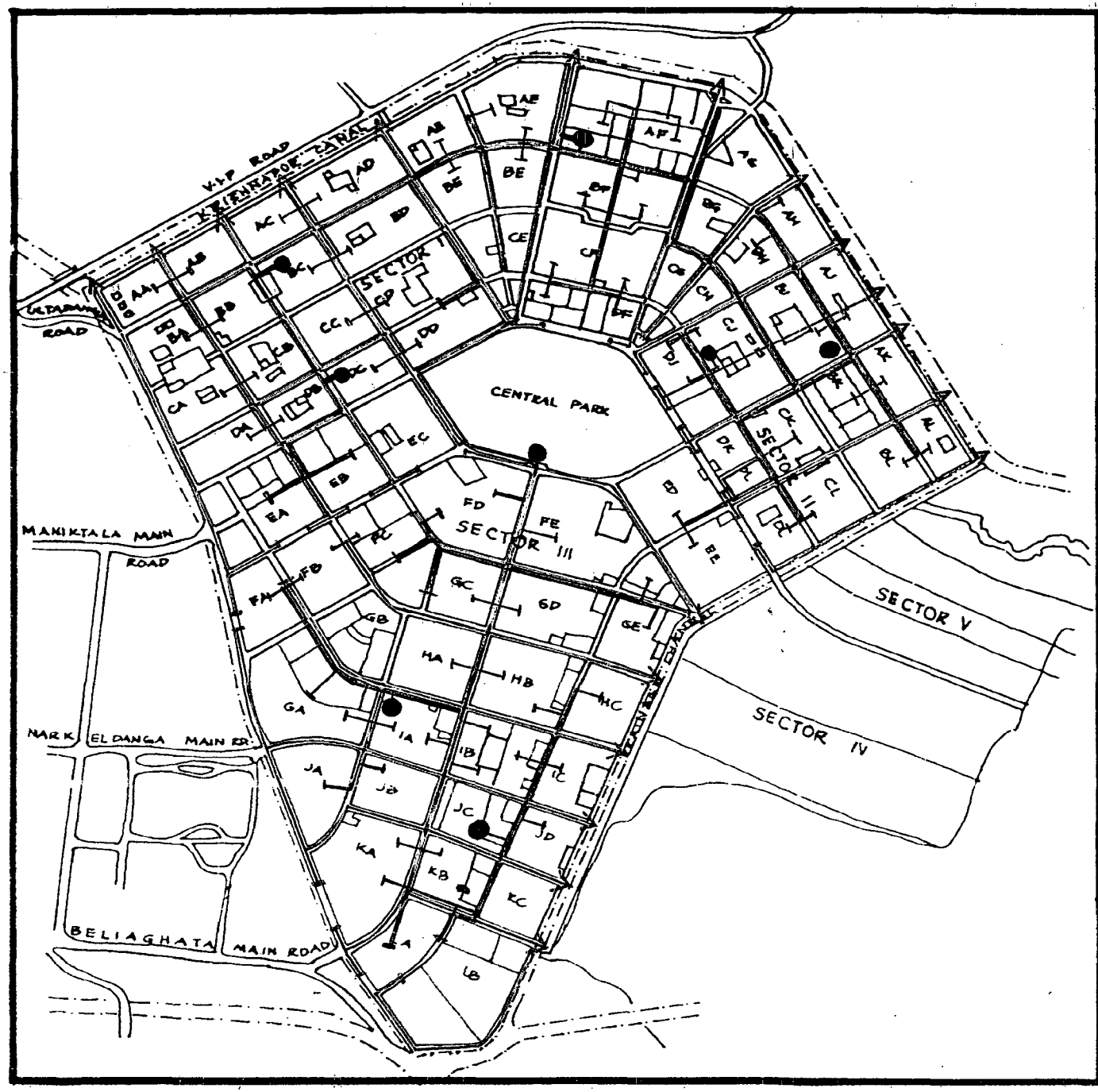
In planning Salt Lake city, a better standard of urban living has been aimed at. The emphasis is on improving standards to attract government and government undertaking offices now located in the BED Bagh, Chowringhee and other equally congested areas in the Central Calcutta.

The northern part of the Salt lake was choosen for development, because it was more readily accessible to Calcutta's bus business district. four trains access roads namely Ulltadanga, Maniktala, Narkeldanga and Beliaghata - link Salt lake of BED Bagh, Explanade, Howrah and Sealdah stations, the centres of Calcutta.

The total facilities and services perceived for Salt Lake for 2001 will be discussed under separate paragraphs in third chapter.

5.3.1 Sewerage and Draiange

The sewerage disposal system has been designed to eliminate possibilities of swellage congestion and water logging in the streets, as also to reduce running costs. Both sewerage and storm water channels are underground, independent with separate pipes and pumps. the 6 feet dia



LEGEND

- SEWERAGE
- DRAINAGE
- PUMPING STATION

SEWERAGE & DRAINAGE PLAN

SALT LAKE (BIDHAN NAGAR)

CALCUTTA

storm water channels run under the road and the 8 inch dia sullage lines goes through the plots. Sullage flows by gravity to the nearest pumping stations from where it is pumped to the Bagjob sewerage treatment plant for removal of pollutants. The treated liquid effluent is discharged into the Bagjola canal and the solid digested sludge is ultimately used as manure. the storm water drainage flows entirely by gravity and falls into Krishnopur canal. The drainage system of sector I and II are sloped in the North west and north east directions, respectively having outfalls points in the Kirshnapur canal, while the drainage system of sector III, IV and V are sloped east ward having outflow points on the eastern draiange canal. The total length of sludge and storm water lines are approx. 170 miles and 120 miles respectively.

The sewerage system for Salt lake city shows a branched out sewage system with two stage pumping. Initially the sewage is collected from the blocks through the laterals into the branch sewer lines from where the sewage is pumped to the main sewer line.

The sewage is collected from the main sewer to the TRUNK sewer which is again pumped into the OUTFALLSEWER which carries it to the sewage treatment plant on the other side of VIP road (Mazrul Islam Avenue). The capacity of the sewers is as per specifications prescribed by WHO and CMPO experts. They assumed by 2001, the population will be

500,000 and the daily flow of sewage from sector I, II and III will be 5,4 and 5 million gallons respectively and suggested for the capacity of the Bagjola sewage treatment plant to be 14 million gallons, which is much low at present. The length of the sewers in the 3 sectors are 103 km, 98 km and 104 km respectively. There is no sewerage system for Sector V, the Industrial Sector, where they have to arrange their own system.

5.3.2 Water Supply

The water supply has been designed for an over all supply of 220 litres per capita per day, out of which 180 litres would be for domestic use and rest 40 for cleaning roads, fire fighting and other public utility services. Supplies are from deep tubewell pumped to overhead reservoirs after treatment for iron elimination and disinfection. A total of 16 such reservoirs are there. (Sector I (6), Sector II (4), Sector III (6)). Each one will serve 25,000 residents. It is planned that the deep tubewell will be replaced by surface water supply of Calcutta Corporation from Palta Tallah System, after which deep tubewells will remain as standby. Because of the high contamination of iron in the water, special iron filter is used before the distribution of water.

5.3.3 Civic Amenities

The civic amenities include officers local centres,

markets, primary and secondary schools, hospitals, cinema halls, community centre, open air theatre, swimming pool, play ground and parks and bus depots.

A total of 28 local centres have been proposed for the entire salt lake area aprt from the city level commercial centre. It has tried to maintain 6 shops per 1000 population as per the populationat the end of this century.

In the present plan there is a provision for 21 primary schools, 8 secondary schools and 3 academic colleges. Among the other facilitiesm there are provision for cinema halls, clubs/civic centres, post offices, police station, fire services etc.

5.4 HOUSING

In Salt Lake, there will be 15,000 residential buildings and other than this there will br 40,000 residential flats and 4,000 cooperative flats.

In the original plan of Toskovic, there were provisions for more high rise buildings with apartments than plotted development. But the irrigation engineers changed this concept and opted for more plotted development.

The residential plots are of different sizes which varies from 2 Kothah to 5 Kottah (1 Kottah = 66.89 sqm). Most of the plates are of 4 Kottah (35%) and 3 Kottah (24%) and 2 Kottah (15%). In different sizes of plots the number

of floors also changes.

FLOOR AREA AND ALLOWABLE FLOORS IN DIFFERENT CATEGORIES OF PLOTS IN SALT LAKE

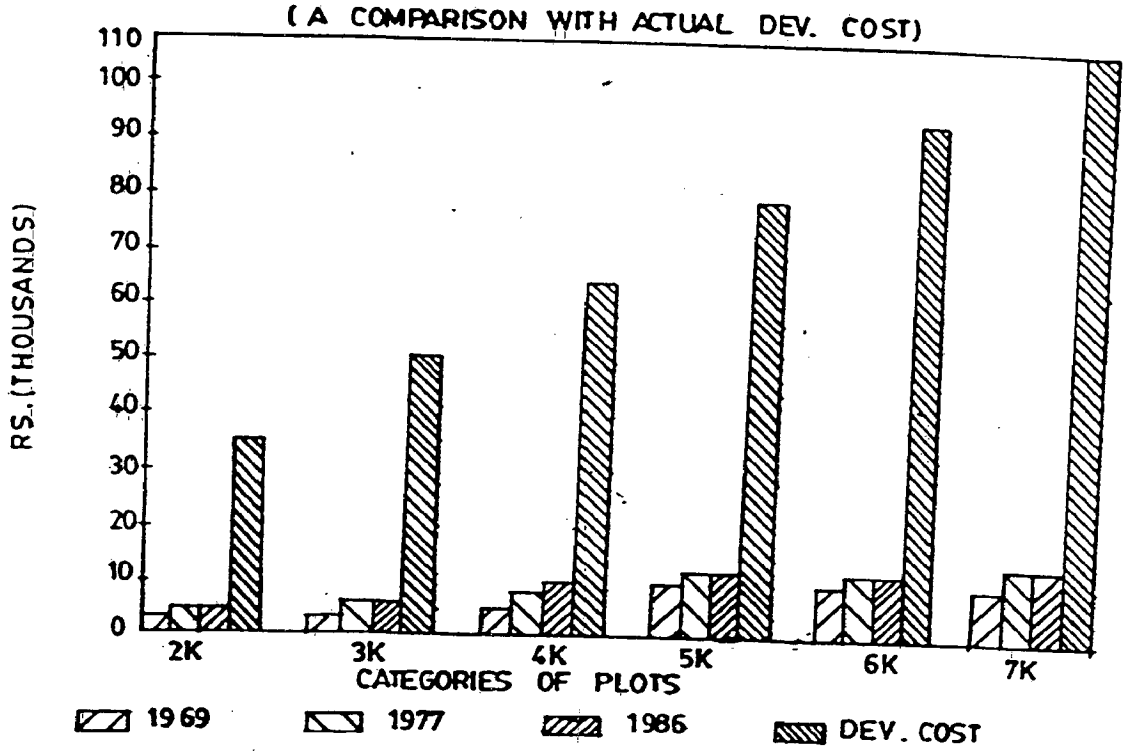
Area of Plots in Kottahs	FAR	Maximum no. of floors allowed
2	125	Ground + 1
3	125	Ground + 1
4	175	Ground + 2
5	175	Ground + 2
6	210	Ground + 3
7	210	Ground + 3
8	225	Ground + 4
9	225	Ground + 4
10	320	Ground + 7

Source : Buliding Rules for Bidhannagar

(NOTE : Table of Price of residential plots in Salt Lake)

The plots of 6 to 10 kottah are allotted to the different housing societies. The price also varies with the size of the plots.

Additional charges for locational advantages were levied arbitrarily without any technical basis. For corner plots on additional 'salami' of Rs. 500/- per kottah was fixed. For shop allowable plots it was the same. For the plots facing towards the parks another 6 to 12% extra of the



PRICE OF RESIDENTIAL PLOTS IN SALT LAKE

plot price was charged. Those who had any property in Calcutta Planning Area were not allowed to buy less than 4 kottah plots.

RATES OF RESIDENTIAL PLOTS

Plot Size	Rate per Kottah in Rupees			
	1969	1977	1986	1994
2	3000	5000	5000	All sold
3	3000	6000	6000	All sold
4	5000	8000	10000	All sold
5	10000	10000	12000	All sold
6	10000	12000	12000	All sold
7	10000	14000	All sold	All sold

Source : S.D.A., M.D. Dept., Govt. of West Bengal

However, for housing government has decided to give the land in subsidized price. Now it has also been decided, to allot the lands for housing rather than plotted development. But this change in policy has changed the population target from 4.5 lakhs at 2001, to more than 6 lacs. This might create a pressure on the proposed facilities unless immediate steps are taken for it.

5.5 TRAFFIC

The Northern part of the Salt Lake was chosen for development, because it was more readily accessible to

Calcutta's businees district. Four main access roads, i.e., Ultadanga, Maniktala, Narkeldanya and Belinghata like salt lake city to BBD bagh, Explenade, Howrah and Sealdah stations, the nerve centre of Calcutta.

Straight wide roads with more traffic lanes each way for quicker movement accounts for about 23% of Salt Lake city area, which account for only 6.6%. This eliminate traffic zones and slow movement in Salt Lake city.

There are three types of roads in the project area :

(i) Arterial,
(ii) Spinal, and
(iii) Local

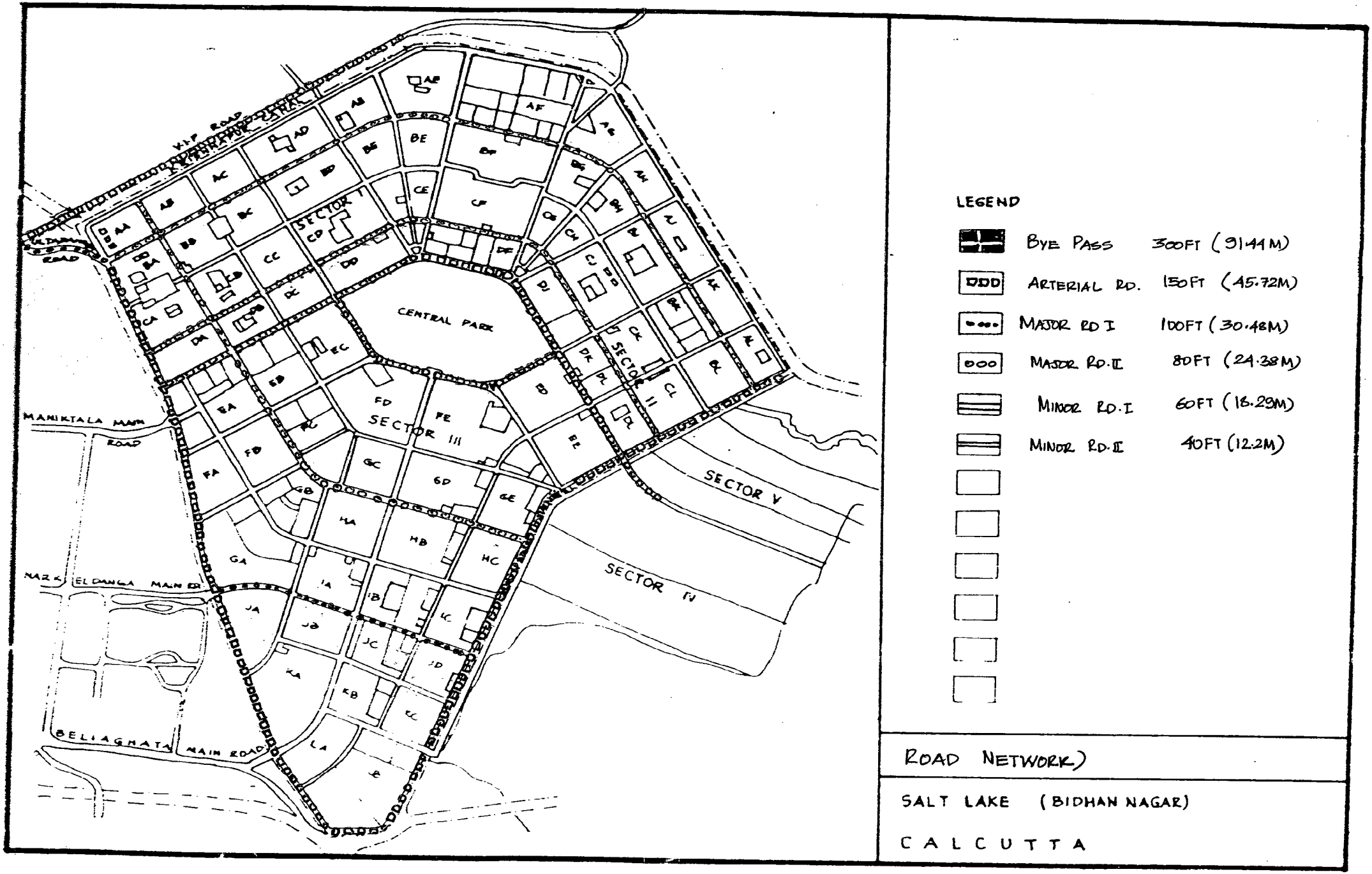
Arterial roads from the entry and exit from Salt lake City.

The spinal roads are for movement within the township and radiate outwards from the central parks.

Spinal roads are intersected by arterial roads at intervals to facilitate the latters use. This combinations marks out and demarcates different blocks.

Local roads run within a block and usually have dead ends which keep heavy traffic out of them.

Out of the arterial roads, four join the main roads outside, providing access to and from Calcutta Airport (Dum


VIP ROAD
CENTRAL PARK
SECTOR I
SECTOR II
SECTOR III
SECTOR IV
SECTOR V
MANIKTALA MAIN ROAD
BELIAGHATA MAIN ROAD
LEGEND
BYE PASS 300FT (91.44M)
ARTERIAL RD. 150FT (45.72M)
MAJOR RD I 100FT (30.48M)
MAJOR RD.II 80FT (24.38M)
MINOR RD.I 60FT (18.29M)
MINOR RD.II 40FT (12.2M)
ROAD NETWORK)
SALT LAKE (BIDHAN NAGAR)
CALCUTTA

Dum) and Jessore Road (National Highway) on the other via Nazrul Islam Avenue (VIP Road). These arterial roads have also been connected to the eastern metropolitan byepass - a wide road connecting Ultadanga and nazrul Islam Avenue with Beliaghata, Park Circus, Ballyganga, Gasia, avoiding congested areas of Calcutta.

The width of the roads for six types vary from 9.14 metres to 48.46 meters. All roads except local ones have dual carriage ways separated by a central median and each carriage way has two lanes of traffic.

Parking space for cars have been provided near important road crossings, markets, local and social centres, schools and offices. But terminals have also been proposed at different important nodes of the city.

The different public modes playing within the city are cycle, rickshaw, auto rickshaw, bus, mini-bus, special bus. The proposal for train within the city was thore but has now been scrapped. The nearest railway station Bidhan Nagar (earlier Ultadnagar) also serves the city from outside.

5.6 COST OF THE PROJECT

Land filling of the entire northern salt lakes were completed by the mid 1970s. Sector V was the last whose filling was delayed for the land acquisition problem. For reclaiming the area the hydraulic principle was accepted as

the dredging was essential for the navigability of the Hooghly river. Westbrook and Schijt of Netherlands Engineering Company in 1953-54, recommended reclamation of Northern Salt Lake of 12.35 sq.km. area for 'New Calcutta' - the name given at that time for Salt Lake. The estimate was prepared by them in their report for reclaiming the area. Total land filling cost was estimated at Rs. 2,820.18 lacs with an average cost of Rs. 99,000.00 per acre.

LAND FILLING COST OF SALT LAKE

Area reclaimed in sq.km.	Estimated 12.35	Actual 15
Total cost (Approx) in Rs.	28,20,18,000/-	37,04,40,000/-
Average cost per acre (Rs)	99,000/-	96,000/-

Source : Project Report SDA, 1980 and NEDCO Report

The land filling project was completed according to schedule, that is why the deviation from the estimate was not much. In fact the average cost of land filling become less with the expansion of the project area, as the overhead costs were shared by these added areas.

LAND DEVELOPMENT COSTS OF SALT LAKE

	Estimated	Actual
Area in sq.km.	12.35	15.6
Total cost in (Rs.) approx.	36,75,00,000/-	50,72,30,000/-
Average cost per acre	1,50,000/-	1,57,000/-

Source : SDA, M.D. Dept., West Bengal

The development costs include Roads, Water Supply, Sewerage System, Drainage, Electrification, Parks etc.

SECTORWISE ACTUAL DEVELOPMENT COSTS

Sector	Total Cost (Rs)	Cost/Acre (Rs)
I	14,58,60,000/-	1,56,000/-
II	8,92,70,000/-	1,58,000/-
III and IV	27,21,00,000/-	1,58,000/-

Source : SDA, MD Dept., West Bengal

Note : In Sector V only roads and drainage system have been developed. Other facilities are to be developed by Individual Industries.

The above table shows that the total expenditure for land filling and development was approximately Rs. 8,750/- lacs and average costs per acre comes around Rs. 3,83,500/-.

5.7 SOURCE OF FINANCE

The work at the beginning involved much foreign exchange. The state government had hoped that it would be possible to arrange for deferred payment, but the sanction of the Finance Ministry was not as readily forthcoming as the State Government wished. It took around seven years to clear up the initial formalities.

Because of the tremendous cost involvement, the work progressed in different time perods. It was therefore, decided to concentrate first on the areas nearest to Calcutta. It forms the Northern tip of Northern Salt lake and has the advantage of being contiguous to Maniktala.

Soon after Dr. B.C. Roy became the Chief Minister, he gave the Salt Lake proposal serious attention.

The State Legislature decided to support the entire cost of the proejct. So the West Bengal Government remain as the sole financer to the Salt Lake project. Till now, Salt Lake has drawn money to the tune of Rs. 450 lakhs approximately per year, whereas the income of the Salt Lake Development Authroity was only 65 lakhs per year. So till now the city depends on subsidies from the Government.

Since, there is no municipality in Salt Lake, no separate allotment is there for Salt Lake City. The authority has to approach different departments of the Govt. to get the sanction or to get the work done.

5.8 ORGANISATION

The reclamation of Salt Lake was concerned with the dredging of silt from the river Hooghly. The responsibility of reclaiming the land was rendered to the Irrigation and Water Ways Department of West Bengal. Under this department, 'Salt Lake Reclamation and Development Board' was formed in 1959. Even after the reclamation project was ever the board continued to work and was asked to prepare development schemes and frame byelaws for the area. The same board was declaed under Bengal Municipal Act, 1932 (Bengal Act XV of 1932) as Salt Lake Development Authority in 1972 under Metropolitan Development Department, West Bengal. This advisory committees functional period was extended again from July 1978.

The Metropolitan Development Department of government of West Bengal is the administrative department incharge of the Salt Lake City Development. Under this the advisory committee with the local MLA as Chairman, the special engineer, Salt Lake as Member Secretary and administrator and few members of the public as members were set up toa dvice the government regarding developments and the administration of Sale Lake.

A design cell under the guidance of the Chief Engineer Advisor and Special Engineer, is in charge of land distribution and choice of plots by the purchasers.

The municipal services and Estate Management of the township are under the control of Administrator, Salt Lake. The post of Assistant Secretary are occupied by State Civil servants. Chief Engineer Advisor, Special Engineer, Administrator and all other Executive Engineers are from the Irrigation Department. Even under the planning cell, no qualified planner is there. There is only one post for architect, and his duty is to sanction the building plans only. The hierarchy of the organisational set up is shown in the chart.

Salt Lake remains under 24 paragans and did not have urban status till 1975, when it completed all the criteria for urban area. Till then it did not have its own police administration. Some municipal services were also shared with surrounding wards. Now salt lake has its own organizations within it.

5.9 THE ROLE OF PRESENT MANAGEMENT

The present status of Salt Lake is 'Government township' under section 327 of the Bengal Municipal Act, 1932 as declared on 22nd January 1976. Salt Lake Development Authority with the help of its advisory committee looks after the different aspects. It prepares the plan, executes it, performs all engineering works and also renders municipal services for salt lake city only. It also collects tax from the area.

On 16th June 1988, the State Government had issued a notice under Secton 93A of Part III-A of the Bengal Municipal Act, 1932 stating the intention of declaring Salt lake (Bidhan Nagar) city as a 'notified area' and asked for objections, if any within three months. But no body objected against it. The process of creating a 'Notified Area Committee' is still underway. At present Salt Lake can not be declared a municipality straight away by section 6 of the Act. Because it states, 'if such town is constituted a municipality, the municipal income from taxation and other sources is likely to be adequate for the discharge of the municipal functions under this act' [Section 6(i)9c]. This is about the fiscal ability of the proposed municipality. It has to be ensured that the municipality when constituted may be in a position to raise sufficient resources to finance the civic services. But the estimated expenditure and income of Salt Lake Municipal Division of S.D.A. are Rs. 150 lacs and Rs. 65 lacs respectively. So it is not satisfying one of very basic requirements.

CHAPTER - 6

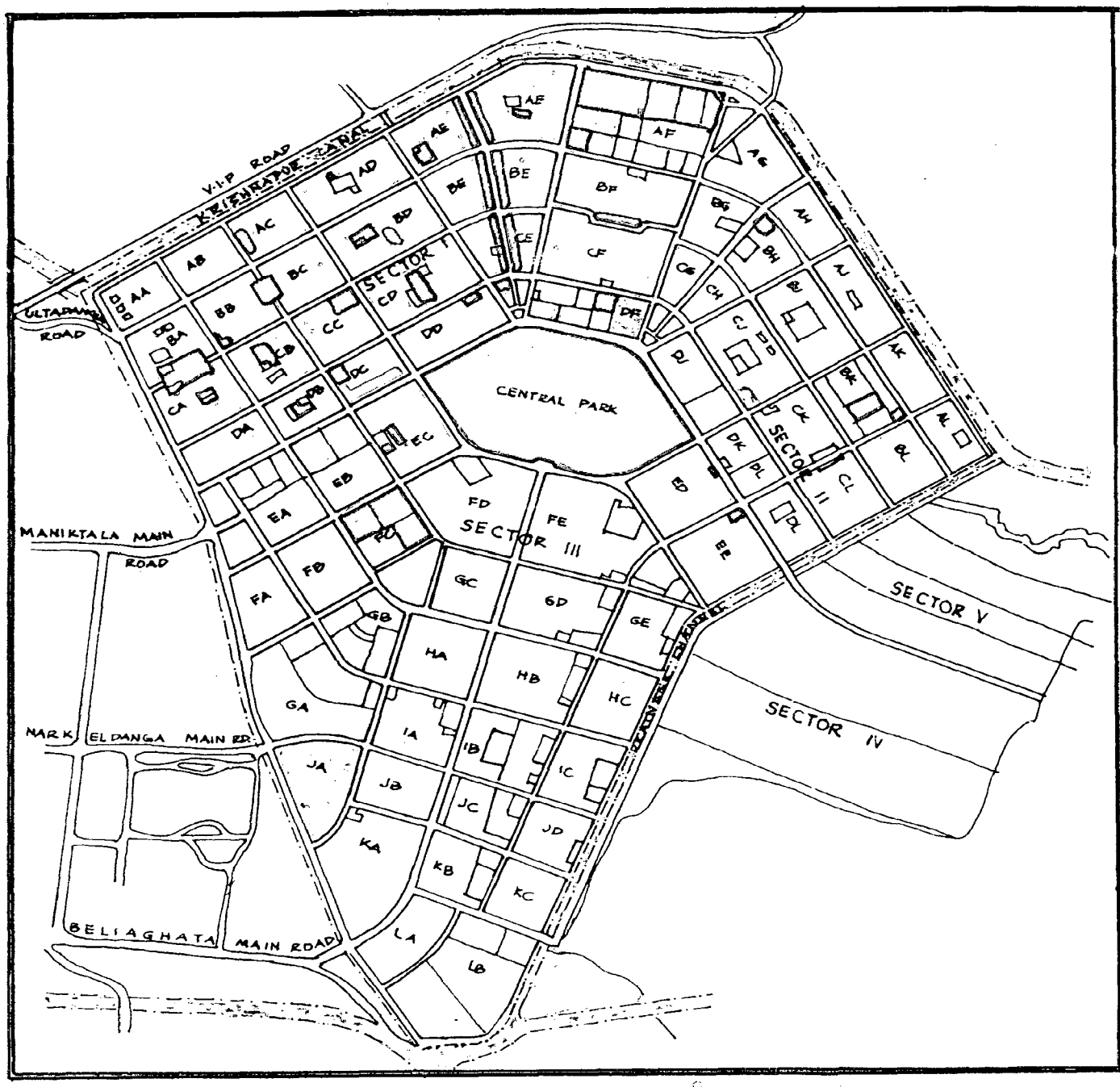
SLAT LAKE CITY - THE PRESENT SITUATION

6.1 THE EVOLUTION OF SALT LAKE AS AN EXPANSION OF CALCUTTA

Salt Lake was initiated as a separate township to help relieve the increasing congestion in Calcutta and not as an expansion of the metropolis. However, in the process of development, the importance of Salt lake as an expansion of Calcutta has been realized. The objectives of the salt lake porject were then modified several times. The existing objectives of the project are :

New areas to absorb future metropolitan growth by creating an integrated township with additional employment opportunity. It is to be a self contained HIG and MIG township for about 2.00 lacs population at the initial stage with an ultimate target of 4.25 lakhs (CMDA, 1986).

For relieving the congestion in Calcutta, different Government offices had been shifted to Salt Lake from the Birth of the township. Through it was very near to BED bagh, the CBD of Calcutta, it remained far for the people who commuted to and from salt lake for the first 15 years, due to the lack of a proper transport system and poor road connections with Calcutta. At the beginning residential and non-residential allotments became scattered and community facilities become unbalanced. In 1971-72, it became the



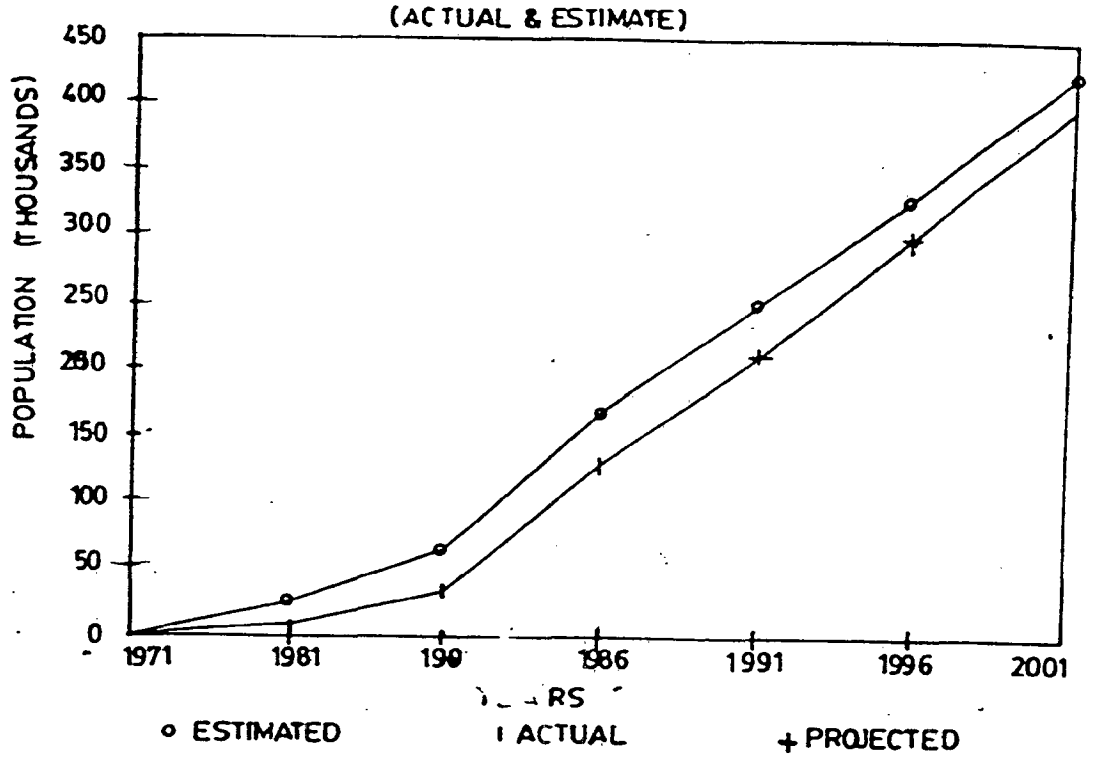
LEGEND

- RESIDENTIAL
- PUB. UTILITIES & INSTITUTIONAL.
- GOVT. FUNCTIONS
- TRADE & COMMERCE
- ORGANIZED OPEN SPACE
- RECREATIONAL
- SPORTS COMPLEX
- INDUSTRIAL
- ACTIVITY SPINE
- TRANSPORT
- ROADS
- DEFENCE.

PREDOMINANT LANDUSE MAP 1980

SALT LAKE (BIDHAN NAGAR)

CALCUTTA



POPULATION GROWTH OF SALT LAKE

rebabilitation site of Bangladesh refugees. Nobody considered the new area, as a part of Calcutta.

Then there was a break in this situation in 1972 after the All India Congress Committee's Convention which was held in Salt Lake and attended by Mrs. Indira Gandhi, the then Prime Minister. Different facilities started coming up, Salt Lake was noticed by the people and the feeling that it was a part of Calcutta took roots.

6.2 DEMOGRAPHIC PROFILE

The boom in Salt Lake started after 1972-73, the populations growth curve is becoming steeper and steeper every year, but it is still below the estimated rate of growth.

POPULATION GROWTH AND PROJECTION OF SALT LAKE

Year	Estimate	Actual
1971	-	1600
1976	-	10000
1981	66,000	33175*
1986	-	130000
1991	250,000	210000
1996	-	300,000*
2001	425,000	370,000*

Source : Census 1981

* Projected from past trend.

At present about 37,000 households are there in Salt Lake (considering 6.5 per household). At present the number of household residing in one building is about 3.1. this figure includes the housing estates also.

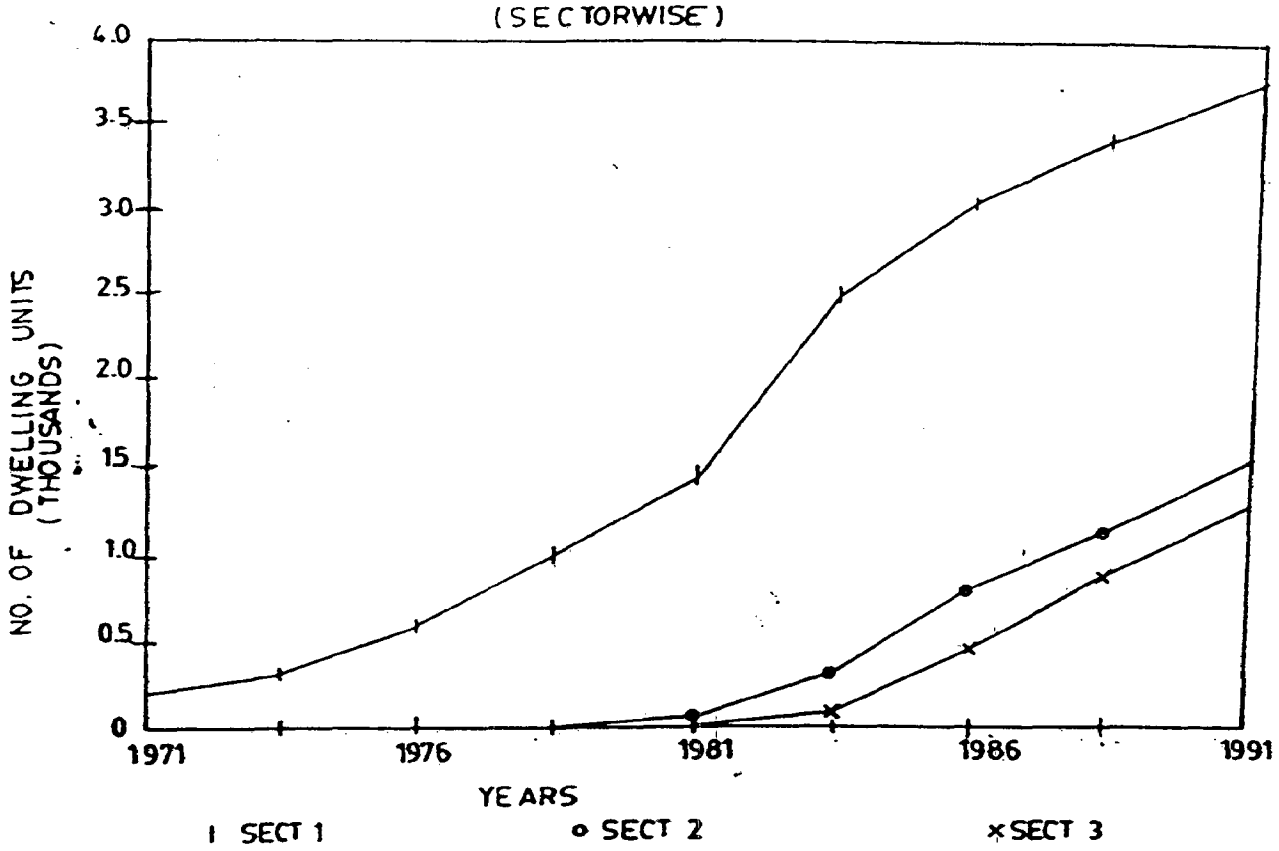
CUMULATIVE NUMBERS OF RESIDENTIAL BUILDINGS COMPLETED IN SALT LAKE

Year	sector(s)			
	I	II	III	IV
1971	205	-	-	-
1976	593	-	-	-
1981	1432	47	-	N.A.
1986	3056	810	450	816
1991	**3421**	1143	883	816

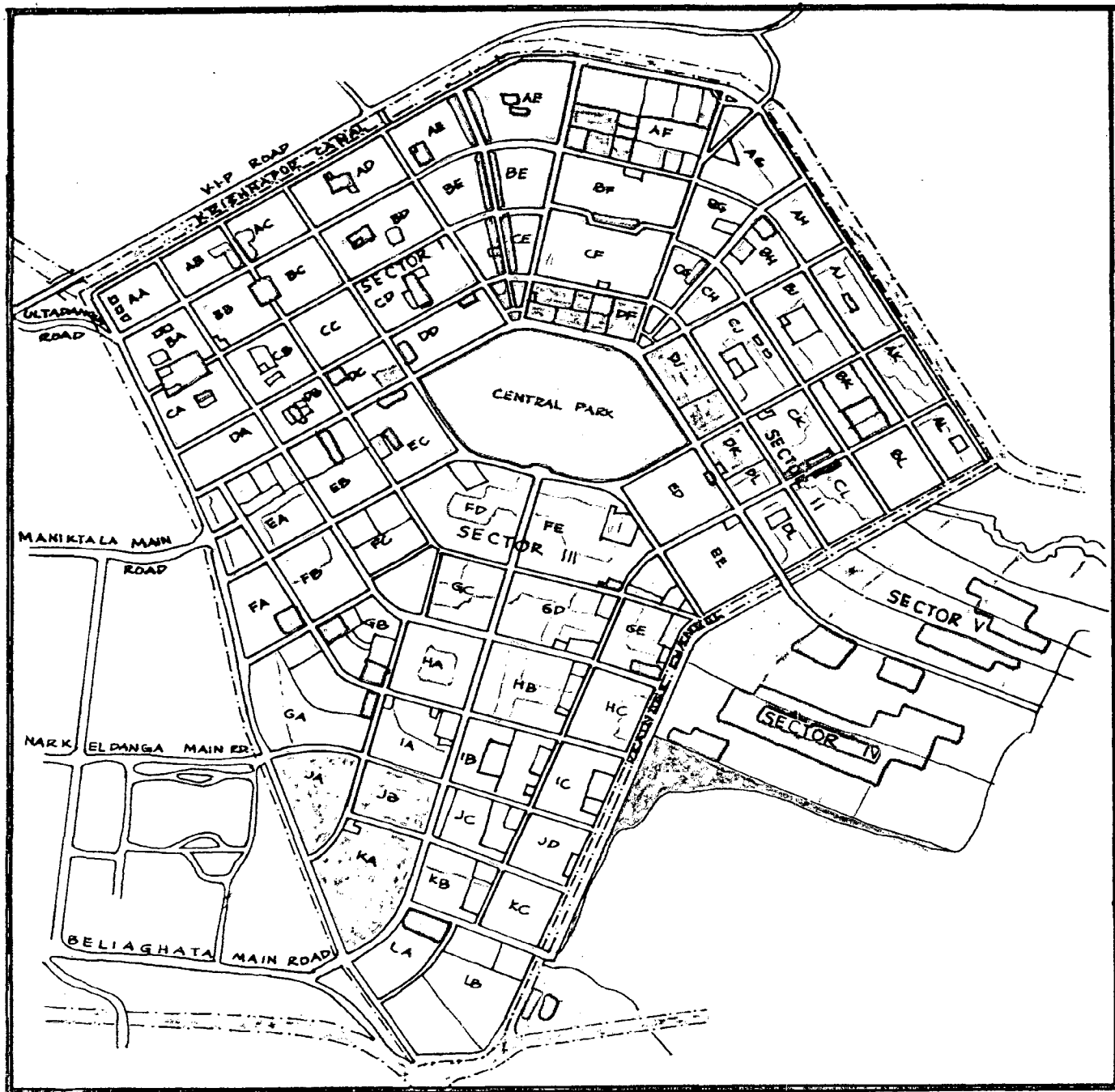
Source : SDA, M.D. Dept., West Bengal

At present, more housing estates are coming up. These are more in sector III and that is why though the growth of buildings are low, the increase of density is higher than other sectors.

The present sex ratio of Salt Lake is 900 against C.M.D.'s 712. It indicates that the composition of Salt Lakes population is different from Calcutta. Here more families have been accommodated than single male migrants.



GROWTH OF DWELLING UNITS IN SALT LAKE



LEGEND

- RESIDENTIAL
- PUB. UTILITIES & INSTITUTIONAL.
- GOVT. FUNCTIONS
- TRADE & COMMERCE
- ORGANIZED OPEN SPACE
- RECREATIONAL
- SPORTS COMPLEX
- INDUSTRIAL
- ACTIVITY SPINE
- TRANSPORT
- ROADS
- DEFENCE.

PREDOMINANT LANDUSE MAP 1990

SALT LAKE (BIDHAN NAGAR)

CALCUTTA

Here the litracy rate is also higher (74.56%) than Calcutta's (69.13%). Female literacy is 69.57% aganst Calcutta's 63.25%. This also reveals that the general standards of living in Salt Lake is higher than that of Calcutta.

As the sex ratio of Salt lake indicates there are more families residing in the area and, therefore, there are more school going children and housewives. Due to more male selective migration the male workers are much more in Calcutta (73.47%) than in Salt Lake (54.62%).

AGE SEX POPULATION STRUCTURE OF SALT LAKE

Age Group	Total (100%)	Male %	Female %
0-9	13.63	48.24	51.76
10-19	13.63	49.41	50.59
20-29	15.80	57.36	42.64
30-39	14.27	54.49	45.51
40-49	13.95	50.57	49.43
50-59	14.11	51.70	48.30
60+	14.61	49.45	50.55
Total	100.00	51.73	48.27

Source : Sample Survey

The primary survey's sex ratio (933) varies slightly from the census, sex ratio (900). This is because, the primary survey did not include any construction works, which constitutes a considerable part of the population at present.

SEX RATIO AND FAMILY SIZE IN SLAT LAKE (SECTORWISE)

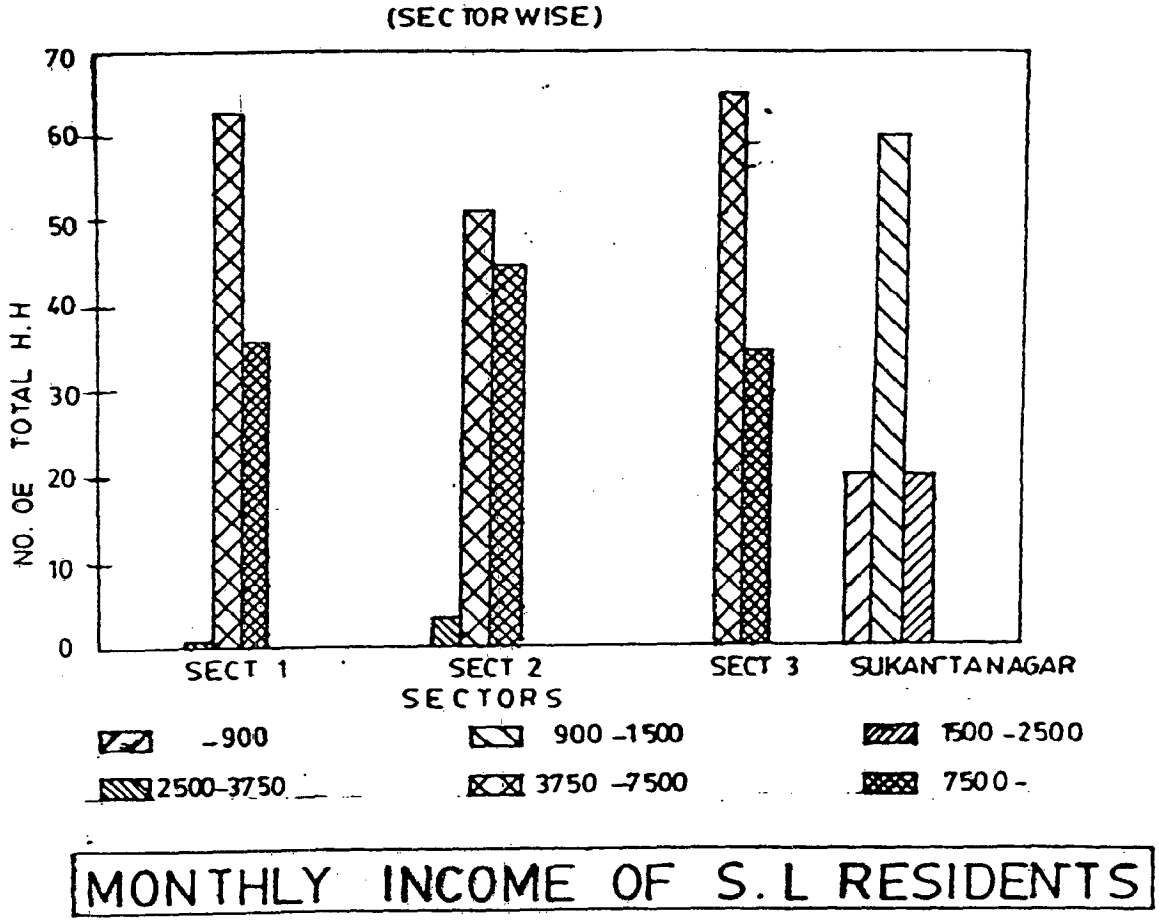
Sector	Sex Ratio (per 1000 male)	Average Family size
I	954	5.1
II	952	4.56
III	890	4.61
Sukant Nagar IV	857	5.2
Total	933	4.8

Source : Sample Survey

To demographic character of Sukantanagar is a little different from the other sectors of Salt Lake. This is because they consist mostly of the rehabilitated population, who were affected during the expansion of the metropolis towards Salt Lake. They are the original inhabitants of the Salt lake Area. They belong to mostly EWS and LIG categories.

Income pattern of Salt Lake Population

The income pattern shows, that the majority of the



MONTHLY INCOME OF S.L RESIDENTS

population of Salt Lake belong to high income groups, particularly in the first 3 sectors. A small percentage of sector II constitutes an LIG population because in the Karunmayee Housing Estate some allotment was offered to LIG population and the Lutharian World Service has built some housing for the LIG population.

6.3 PRESENT STAGE OF DEVELOPMENT

The existing stage of development, sector and block wise are described in the following tables. The tables show that almost all physical developments have been completed in Salt Lake. In sector I, it is 100%, in other sectors it is yet to reach cent percent. Road lighting is partial in Sector III and IV.

In sector I the built up residential area is now more than sector II and III. In the three sectors approximate built up residential plots are 80%, 60% and 45% respectively. In sector IV, Sukantnagar houses were built on 1½ Kottah of land by government only, so they cover all the residential plots of the area.

In sector I, 70% of the parks are ready (including parks within housing estates). But in Sector II and III, most of the parks areas are lying vacant. However, majority of the households was these parks.

USERS OF LOCAL PARKS

Sectors	Percentage of total population who use local parks
Sector I	72%
Sector II	82.5%
Sector III	88%
Sukant nagar	99%
Total	74.65%

Source : Sample Survey

It has been found that in the first three sectors, parks are mostly used by the children and old people. In housing estates most of the people use the parks. That is why the percentage user of parks in Sector II and III is higher than Sector I. Sector IV, Sukantanagar, still retains a village culture. here throughout the day different a age group gather in the local park, i.e., an open space in different parts of time in a day.

Vacant spaces are mostly used for the games like football and cricket by the elder children, than the open spaces, because here the parks are usually too small for such games.

153 acres of the Central Park is still undeveloped. Once boating was introduced in the lake of the park for a

very short time after which it was withdrawn. In front of Sect. Bhawan, a small part has been developed in the Central park, as a football ground, which is used by the office workers sometimes. Local residents hardly use this park at present.

Educational institutes are coming up in the area, but they are not fully utilized by the local people.

PERCENTAGE OF HOUSEHOLDS IN SALT LAKE WHO AVAILS EDUCATIONAL FACILITIES OF SALT LAKE

Sectors	% of Households
Sector I	37%
Sector II	35%
Sector III	43.25%
Sukantanagar	80%
Total	37.14%

Source : Sample Survey

It shows that only 37% of the local population uses the local schools. the local schools have not yet established their status compared to other renouned schools in Calcutta. So the HIG, even MIG parents prefer to send their children to even South of Calcutta. These local schools mostly get students from nearby Ultadanga, Laketown, Belighata area. However, the necessary Nursury schools are

mostly used by local inhabitants. The only college of Salt Lake has started with Arts Sections only and is little known to the local people. At present, there are 6 primary schools and 5 secondary schools in Salt Lake. Even now, community facilities are scanty in Salt Lake. For 2,50,000 population, there are only 10 shopping centres in Salt Lake. Out of these 6 are located in Sector I. Almost everybody uses these centres regularly or often.

LOCAL SHOPPING BY SALT LAKE RESIDENTS

Sectors	Percentage of Household use	
	Regular	Often
Sector I	79.0	21.0
Sector II	87.9	12.1
Sector III	90.44	9.56
Sukantanagar	00.00	00.00
Total	77.56	22.46

Source : Sample Survey

It shows that 77% of the people use their local centres. In Sukantanagar the local centre has not started yet and so the figure remains nil, though the peramanent shop structure are ready. The residents of Sukantanagar usually go to Beliaghata market for their regular marketing.

Since the vehicle ownership is high in Salt Lake, they go out of Salt Lake for marketing of their own choice.

More often than these regular shopping centres, there are informal shops in many blocks. They usually serve the respective blocks. There is no specialized or wholesale market in Salt Lake, which can serve the adjoining areas also.

At present, there are only two petrol pumps, one situated in Sector I and the other in Sector III, i.e. in F.D. block. But these can not meet the local demand and become dry very often. But of rate the supply situation has improved. 66% of the households in Salt Lake own either a car or a two wheeler.

There is no cinema hall to serve the population at present. Two cinema halls are under construction in salt lake and one of them is almost complete in D.C. block. In this block (a commercial block) a five star hotel (Hotel Salty) is coming up which may complete with the nearby Airport Hotel.

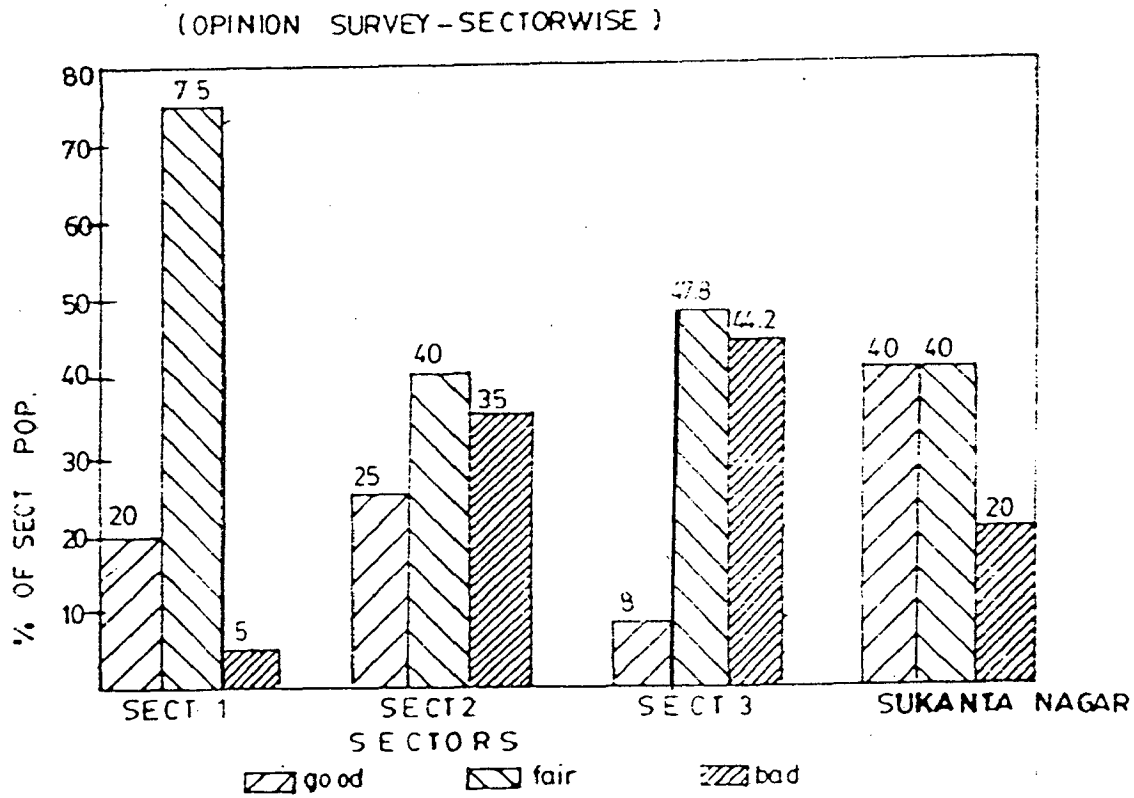
Though there was a plan for a community centre in each block, not a single one is existing. The only club in Salt Lake is situated in B.F. block of Sector I on 43 Kottah of land within it. There is a well mentioned swimming pool there which is very popular the Salt Lake residents. The original plan did not give any provision for a stadium in

Salt Lake. When Calcutta was trying to host the Asian Games the Government allotted J.A., J.B. and K.A. i.e. 3 blocks (105 acres) for building up.

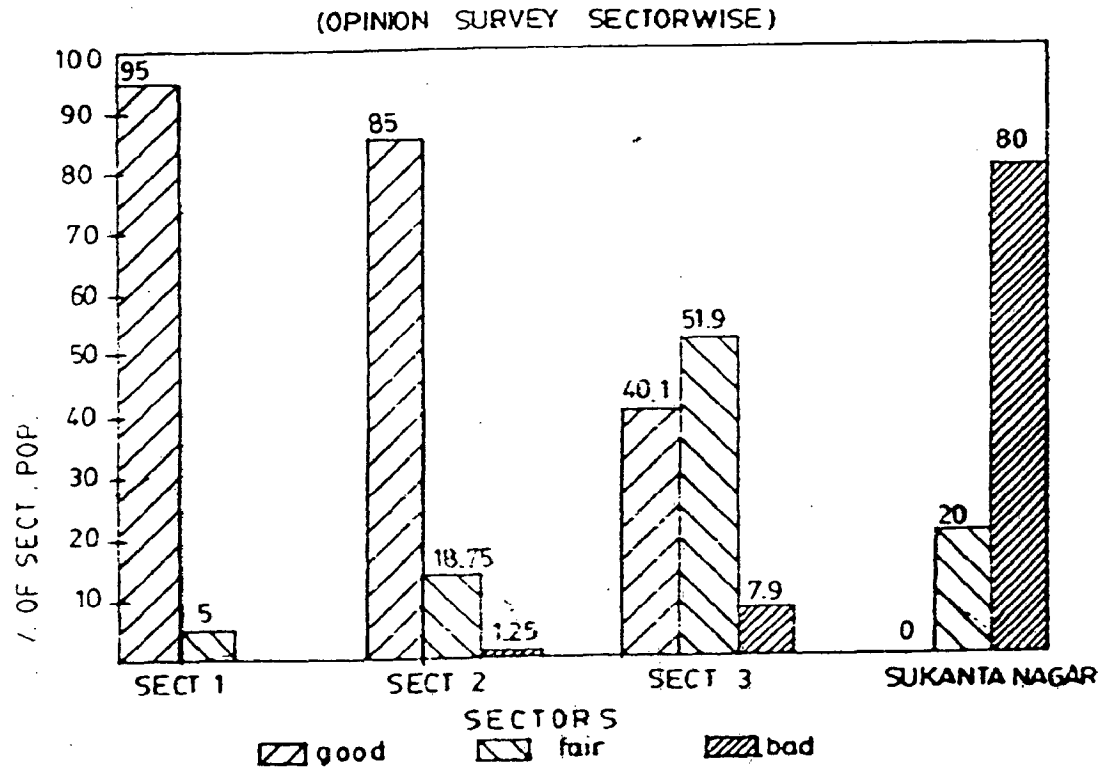
In 1972, GERHARD MEIGHORBER, Architect Planner of Munich Olympic came to work out the details. The stadium was completed by 1986, with a capacity of 1 lac 30 thousand. Alongwith the stadium there is a Youth Hostel.

Compared to what it was in the beginning the communication system has improved a lot but is yet to be satisfactory. Now buses are plying in 29 different routes. Four shutter buses also fly between Salt Lake Sect. Bhawan and Maniktala. There are 13 ordinary bus routes, 3 limites routes, 4 delux bus routes and 9 routes for minibuses. Other than these 2 private bus stand routes and 4 minibus routes are under consideration.

Auto Rickshaws and cycle rickshaws are also supporting the local transportation system. Auto rickshaws of Salt Lake have 24 parganas licence, and so they can not enter Calcutta Municipal area legally. However, those is a regular auto service between Ultadarya station and Salt Lake, but they usually refuse to go by meter. However, connectivity within Salt Lake is better than with Calcutta except in Sukantanagar. For outside connection Sukantanagar inhabitants go to adjacent Beliaghata terminals.



CONNECTIVITY OF SALT LAKE WITH CALCUTTA



CONNECTIVITY WITHIN SALT LAKE

CONNECTIVITY OF SALT LAKE - WITHIN AND OUTSIDE
(OPINION SURVEY)

Sectors	Connectivity					
	Within Salt Lake			Within Calcutta		
	Good %	Fiar %	Bad %	Good %	Fair %	Bad %
Sector I	95	05	00	20	75	05
Sector II	85	13.75	01.25	25	40	35
Sector III	40.15	51.87	07.98	07.98	47.88	44.14
Sukantanagar	00	20.20	80	40	40	20
Total	94.07	20	03.93	17.14	51.73	31.08

Source : Sample Survey

6.4 PUBLIC SATISFACTION

The above table reveals the public saisfaction nature on different facilities. If it is compared columnwise, it states satisfaction is generally low in Salt Lake - the 'Bad' column has usually the higher figures. The percentage of opinion expressed usually also indicates peoples concern or feeling about any aspects. About recreation facilities maximum number of people (3%) have expressed their view. This is because hardly any recreational facilities are available in Salt Lake and almost everybody feels it. For any recreation they have to go out of Salt Lake.

On the other hand, no religious facilities are

available in the area, but minimum opinion has been expressed on this aspect. This indicates that the people of Salt Lake are not very keen on this aspect.

SALT LAKE CITIZENS OPINION ON DIFFERENT FACILITIES IN SLAT LAKE

Facilities	Opinion			Opinion Given
	Good %	Fair %	Bad %	
1. Transportation	42	35	03	91
2. Shopping	11	69	20	92
3. Schooling				
(a) Nursury	34	66	00	89
(b) Primary	15	55	30	88
(c) H.S./Sec.	01	32	67	88
4. Recreation	00	07	93	89
5. Games/Sports	00	16	84	93
6. Religion	00	10	90	79
7. Social Mining	19	38	43	82
8. Public Sectors (Bank/P.O.etc)	05	30	65	90
9. Sewerage/ Drainage	24	66	10	87
10. Health	19	42	39	87
11. Environment	16	50	34	87
12. Planning of Salt Lake	34	53	13	80

NOTE : GOOD + FAIR + BAD = 100

Source : Sample Survey

In the day to day life marketing, community to and from the working place and different public services like banks, post offices, police cooperatives etc. are required. So on these aspects also, more than 90% opinion has been expressed by the people. Marketing and transportation facilities are fair enough, through not good. They feel public services are too less to be satisfactory.

Though, Salt Lake Stadium is situated here, local people think that there are hardly any facilities for their children to practice games and sports. The stadium serves the purpose only at the National level.

About school education, the people are fairly satisfied but the college facilities they feel, need to be developed.

Since around 1990 Salt Lake has started experiencing water logging on the roads in some parts of Salt Lake. It bed them to come to the conclusion that drainage facilities are not as good as they used to think and they expressed their opinion about drainage as fair (66%).

Though there is a lot of here and cry going on about the environment impact of Salt Lake, the local inhabitants are not much bothered about that - they find its fair enough for them.

There are many criticism agianst the planning of Salt Lake, though only 80% of the random sample survey have expressed their opinion in this regard.

Now, 34% of the opinion expressed think the planning of Salt Lake is good and 53% think it is fair.

6.5 THE ROLE OF SALT LAKE

Salt Lake was perceived to play a vital role in relieving the tremendous pressure from Calcutta. For this many officers were shifted from the congested B.B.D. Bagh area of Calcutta to here in Salt Lake. Many scattered departments of the Government were collected together and shifted to Salt Lake. They draw a large number of people to Salt Lake everyday.

The Industrial Sector is coming up in Secot V, very fast. Some of the Industries are important at a natural level. These industries will be generating more employment in the region and will help to boost up the economy of the state.

Salt Lake has given shelter to 2.5 lakhs people, those who were stating mostly in Calcutta, many of whom were staying in rented houses. Many of them came from where sources were sub-standard. In this way, Salt Lake is playing a vital role for Calcutta. But Salt Lake is yet to play an important role for its immediate adjoining areas, and there is a tremendous scope for it.

CHAPTER 7

CHAPTER - 7

EVALUATION IN GENERAL

7.1 LOCATIONAL ASPECTS

The location for new township was selected because of certain advantages. These are :

(a) It is situated at the eastern fringe of Calcutta, so it would be able to break the existing north south ribbon growth.

(b) It is more easily accessible to Calcutta's business district, which is only 5 kilometer from Salt Lake.

(c) Vast margin land were easily available, though in the form of low lying lakes.

Inspite of these advantages, there were certain disadvantages of this location :

(a) The vast lake and wetland plays an important role in maintaining the ecological balance of Calcutta city.

(b) It deskilled the inhabitants fishermen of Salt Lake by filling the lakes.

(c) Expansion towards east would lead to more river crossing and would increase the pressure on Howrah Bridge.

Another problem because of the expansion of the city toward east is also important. The metropolitan Calcutta on two sides of the river is spread unevenly. One third people live on the west bank with more high and vacant land and railway facilities, whereas two third people live in the east side where land is low and saucer. As India is mostly connected with the Howrah side, more concentration on the east means more river crossing. It was connected by only the bridge, the second bridge has just come up.

Moreover, Calcutta was already congested with shortage of roads and extending the city towards the east meant more road network apart from disturbing the natural drainage basin. So, from the point of view city expansion on the eastern side was a mistake.

 # Whether to be Viewed as an Expansion or Not

Salt Lake was initiated as a separate township to help relieve living conjection in Calcutta, not as a expansion of the metropolis. However, in the process of development, the importance of Salt Lake as an expansion of Calcutta has been realised. The objectives of the Salt Lake project was then modified several times. The existing objectives of the project are :

* New areas to absorb further future metropolis growth by creating integrated township with additional employment opportunity and self contained HIG and MIG township for

about 2 lakhs population at initial stage with ultimate target of 4.25 lakhs (CMDA, 1986).

* For relieving the conjection in Calcutta different government offices had been shifted to Salt Lake from the birth of the township. Though, it has very near to B.B.O. Bagh, the C.B.D. of Calcutta, it remained for the people who commuted to and fro Salt Lake for first the 15 years, due to the lack of a proper transport system and poor road connections with Calcutta. At the beginning residential and non-residential allotments became scattered and community facilities became unbalanced. In 1971-72, it became the rehabilitation site of Bangladesh refugees. Nobody considered the new area, as a part of Calcutta.

* Then there was a break in this situation in 1972, after the All India Congress Committee's Convention which was held in Salt Lake and attended by Mrs Indira Gandhi, the then Price Minister. Different facilities started coming up. Salt Lake was noticed by the people and the feeling that it was a part of Calcutta task roots.

How Salt Lake Affected the Existing Eco-System

The relationship of Calcutta with the wetlands can be understood from the diagram.

Within the Calcutta Metropolitan area these wetlands

can be easily identified as the most outstanding wetland cluster. These wetlands bear the oldest tradition in world of resource recovery from city's waste. It is also sewage receptacles for the city and they have been used as a Waste Water Fisheries producing more than 10 quintals of fish per acre per year for the city. (Dr. Dhrubajyota Basu and Susmita Sen Management of Urban and Peri-Urban Wetland). So reclamation of these wetlands mesh threat to the urban ecological system of Calcutta, whose affects are to be felt gradully over the period of time. The immediate problems occur due to this are conjection of drainage. So from the ecological point of view the expansion of the city towards these wetlands was a serious mistake.

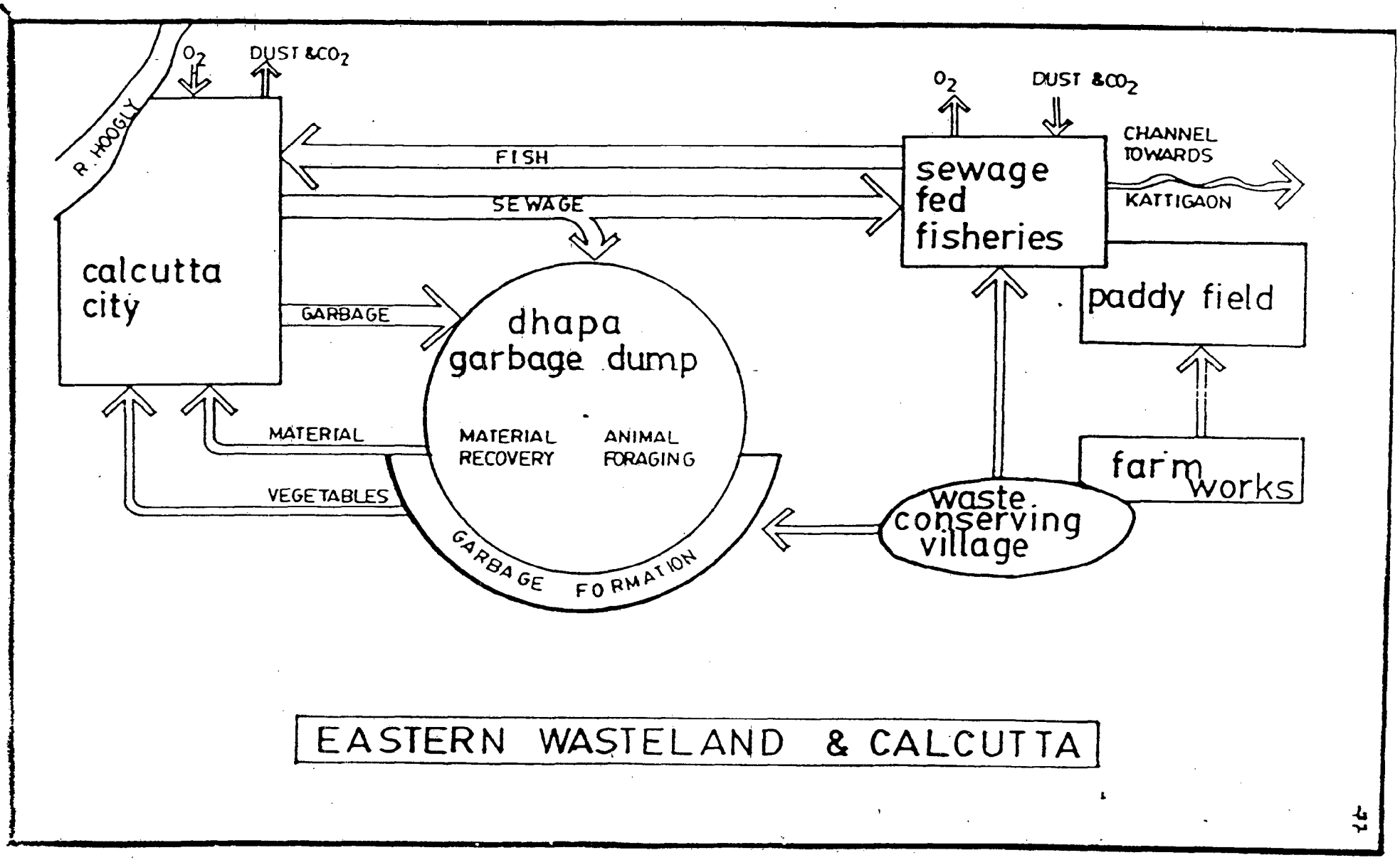
The second problem is a social problem. These fisherman were practicing picoulture by generations. If all of a sudden they are withdrawn from the area means they are becoming unemployed, because they do not have any other skill to work. This problem can be overcome by taking proper care.

However, Dr. Ghosh has shown in his paper that some of these fishermen are now engaged in anti-social activities.

7.2 HOUSING POLICIES

Realistic Space Standards

In the objective of Salt Lake project, it was clearly



EASTERN WASTELAND & CALCUTTA

mentioned that the township would be basically for the lower and middle income community. The decision was right, if one looks at the income pattern of Calcutta's population. During 1963-65, when the plan for Salt Lake was about to be finalised the affordability situation is described in the following table.

RENT PAID BY HOUSEHOLDS BY INCOME GROUPS IN CALCUTTA CITY 1963

Monthly Income level of family (in Rs.)	Average Rent and tax paid month (in Rs)	Rent & Tax paid as % of total income	Average floor space per family(sq.ft)
1 - 100	12.98	16.30	84.17
101 - 200	21.40	13.84	113.85
200 - 350	40.02	14.45	175.50
Three groups together	25.15	14.50	124.94
351 - 700	66.83	13.28	267.18
701 - 1200	120.91	12.79	365.60
1200 and above	243.87	10.36	578.05
Last two groups together	168.73	11.06	448.22

Source : Survey of Housing Conditions in Calcutta Corporation Area, 1963, D. Banerjee, Magarbox, Vo. X, No. 3

The first four groups constitute 90% of the Calcutta's population and stayed in a floor space of less than 50 sqm. But plots were divided in Salt Lake, which was supposed to be for lower and middle income group, in such a way that the minimum plot size was decided as 2 Kottah, i.e. 134 Kottahs which is beyond the affordability of LIG and MIG to buy the plots or build house on them. Realizing the situation Toskovic, in the original plan suggested for more a appartments and less plotted development. But the irrigation engineers then rejected the idea and want for more plotted development and minimum number of plots were 2 cottah and maximum number of plots under 4 kottah (270 sqm). Calculating the area and stipulated families under different categories of plots has been shown in the graph. The graph depict that at present Salt Lake is for only HIG population.

The Government has realised its mistake and now changed its policy for more housing again, but in the process at the end of 15 years, the population in the area will be much beyond the estimated population, i.e. it might reach 8 lacs instead of 4.5 lacs (Harekrishna Ghosh, Executive Engineer, Planning Division, SDA in Salt Lake Samachar, 15th of May, 1988). This will adversely affected the desired facilities planned for Salt Lake.

Different Housing have come up in Salt Lake. Many of them belongs to different government departments. But more of these departments are situated outside the Salt lake and

hence they have to commute outside of the Salt Lake for work.

7.3 LOCATION OF WORK PLACES

Many different housing societies have come up within Sale Lake. Many of them belong to different government departments. But most of these departments are situated outside Salt Lake and hence, they have to commute outside Salt Lake for work.

WORK PLACE OF SALT LAKE POPULATION

Sector	Within Salt Lake	Outside Salt Lake
Sector I	6%	94%
Sector II	10%	90%
Sector III	2.67%	97.33%
Sector known as Sukantanagar	60%	40%
Total	6.79%	93.21%

Source : Sample Survey

By alloting housing and shifting the department properly this problem could have been solved and could have given relief from commuting long distances for work.

7.4 AVAILABILITY OF DOMESTIC HELP

In India, the HIG and MIG population is dependent on service population like domestic servant, washermen, etc. who comes from EWS population. But there is no provision to accommodate these population in the area.

The small percentage of domestic servant which comes from Salt Lake are either from the construction or such workers family, which is involved in works in Salt lake or a small amount of squatter families now residing in Salt Lake area. But they have to leave the area as soon as their work will be over or with the development or all the vacant lands. Most of the servants come from adjoining slum areas of Salt lake by commuting a long distance and hence their charge is higher compared to Calcutta.

AVAILABILITY OF DOMESTIC SERVANTS

Sector	Within Salt Lake	Outside Salt Lake
Sector I	6%	94%
Sector II	5%	95%
Sector III	5.57%	94.43%
Total	5.01%	94.09%

Source : Sample Survey

Conclusion can be drawn from this analysis that the planning of Salt Lake lacks realistic approach.

7.5 AMENITIES AND SERVICES

While planning Salt Lake the irrigation department of West Bengal tried to follow some standards for providing different facilities.

♯ Sewerage and Drainage

These different standards are naturally much better than Calcutta's. But in reality all the standards do not function properly, e.g., the quality of water is not controlled as per T.C.P.O. or W.H.O. standard in Salt Lake. Irvon filtration is not done properly. The underground water level is dwindling very fast.

♯ Water Supply

Though in the plan it was there that ground water will be replaced by the water from palta reservoir by 1985 but it has been unable to supply till yet. With the increasing population and water consumption the groundwater level will go down further. The Central Groundwater Board had found the area unsuitable for an underground reservoir. But now one is being built.

A survey suggests that at least 21 deep tubewells can be sunk for hydro geological resource; 15 are already existing. Still now quantity of potable water supplied in Salt Lake is much more than Calcutta. The Iron and mineral content in water is so high that clothing often becomes

stained and colourless. Pipelines get chocked and rusted. Even after the 22 years any source of water has not been identified. C.M.D.A. is working at present on this.

- **Civic Amenities**

Recreational facilities are almost overlooked in Salt lake. Some of the proposed facilities in the Mater Plan are much less than the T.C.P.O. standards.

Total open space and park areas matches with the T.C.P.O. standards but the hierarchy of the parks for different age groups are completely missing. There is no hierarchy between children park and the central park in Salt lake. This is very vital planning fault.

7.6 TRANSPORT NETWORK

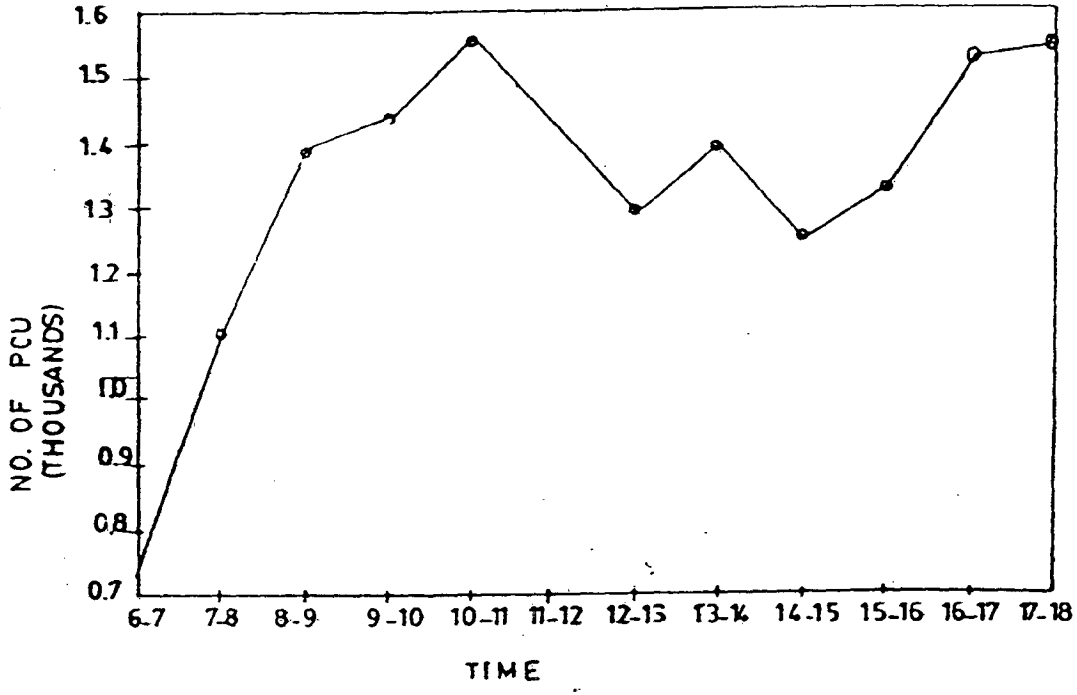
Salt Lake has much better circulation standards than Calcutta. The carriage ways are three times more than Calcutta. The road network system gives a strong north - south corridor structure of the city. Inspite of this the landuse distribution does not match with the network system. The corrdior axis, south of the central park is completely under utilized. On the other hand, the maximum volume of traffic passes through the third hierarchy road (Row 24.38 m) between AB and BB blocks - known as PNB junction.

Right of way (Row) at this point	=	24.38 m
Carriage way	=	19 meter (Approx)
Number of lanes	=	4
Level of service (Los)	=	C (Assumed)
Capacity in P.C.U./hr	=	2800 (from IRC standard)
Volume/capacity ratio for LOSC	=	0.8
Capacity of the road at LOSC	=	2800 x 0.8
	=	2240 PCU
Present peak hour traffic flow	=	1561 PCU/hr
Excess capacity	=	2240-1561
	=	679 PCU/hr

At present only 60% of the total estimated population are there in Salt Lake. But the road in fron of P.N.B. is already getting 80% of its capacity during peak hours. So with the approaching target population there is a chance of heavy traffic conjection in that point. This is because the hierarchy of roads at the entrance of Salt lake are not matched with the hierarchy and LOS of the approaching roads from Calcutta. It shows that landuse and road network of Salt Lake are not compatable to each other.

Time	Direc-tion	TYPES OF VEHICLES								Grand Total
		Car/Taxi	Bus	Minibus	Auto	Cycle	Truck	M.Cycle	Total	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
6.00 - 7.00	Up	86	102	48	3	54	54	11	308	724
	Dn	60	174	54	8	66	48	6	416	
7.00 - 8.00	Up	134	252	84	11	69	66	17	533	1102
	Dn	130	264	66	8	51	36	14	469	
8.00 - 9.00	Up	1711	342	114	18	72	54	24	748	1395
	Dn	188	258	96	16	90	30	19	647	
9.00 - 10.00	Up	260	246	72	15	63	36	31	673	1440
	Dn	270	216	108	24	75	42	32	767	
10.00-11.00	Up	324	300	156	96	72	53	69	702	1561
	Dn	240	318	144	24	66	59	58	859	
11.00-12.00	Up	208	240	162	18	78	54	63	638	1291
	Dn	160	275	84	18	48	72	63	702	

Contd...



FLOW OF TRAFFIC AT P.N.B SALT LAKE

(VOLUME IN PCU)

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11
12.00-1.00	Up	108	240	162	18	78	54	63	638	1291
	Dn	124	227	150	21	93	30	33	653	
1.00 - 200	Up	140	276	180	13	42	78	46	750	1398
	Dn	124	210	144	11	48	102	34	648	
2.00 - 3.00	Up	120	180	162	16	60	78	24	615	1251
	Dn	120	198	162	10	72	72	27	636	
3.00 - 4.00	Up	142	227	114	12	72	78	43	618	1326
	Dn	131	234	156	24	93	54	41	708	
4.00 - 5.00	Up	171	252	126	14	108	48	43	702	1531
	Dn	207	300	160	16	107	46	53	729	
5.00 - 6.00	Up	272	314	106	14	107	30	43	736	1551
	Dn	240	314	108	28	105	54	31	815	

Source : Primary Survey

Note : 1 Car = 1 pcu, 1 Bus/Minibus = 3 pcu,
Cycle/Rickshaw = 1.5 pcu, 1 Auto = 1 pcu ,
1 Truck = 1 pcu, Motor Cycle = 0.5 pcu.

7.7 COMPARATIVE STUDY

Salient Features	Case Study Inferences	Whether same feature are applicable in this case	Evaluation with ref. to Salt Lake
1.	2.	3.	4.
Locational Aspect	- Were located along certain axis to make sure that a uniform growth took place. - Were located at greater distances (40 km)	- In this case an arbitrary strong north south asix was in existance. This was broken by Salt lake on the east. - Was located much closer (5 to 7 km)	- Reclamining the root lake and wet-lands led to the ecological balance being distrubed. - It de-skilled the inhabitants fisher-men of Salt Lake by filling the lakes. - Expansion towards the east would lead to more river crossing and would increase the pressure on Howrah Bridge.
Whether to be viewed as an expansion or not	- The expansion plan should be considered in regional context.	- It was consisdered in the regional contect.	- New areas were needed to absorb future metropolis growth by creating an

1.	2.	3.	4.
	- Regular monitoring for implementation and subsequent planning is needed to other growth of expansion towards the desirable direction - If it is a new town it should be slef contained.	- Initially it was not viewed as an expansion but more of as a new township. - But it was not a self contained entity.	integrated township with additional employment opportunity. - Due to lack of proper transport system and poor road connections with Calcutta - it was not considered a part of Calcutta initially.
Existing ecological system should not be distrubed.	-	- In this case, Salt Lake was built on land reclaimed from Wetlands.	- The expansion of the city (from the ecological point of view) towards these wetlands was a serious mistake. - It caused a social problem, the fishermen was practised pisciculture were sudden enemployed.

1.	2.	3.	4.
			It is a fact some of these fishermen are non engaged in antisocial activities.
Housing Policies	- Adopted realistic space standards. - That wide OPA between LIG, MIG and HIG was not a determining factor. - Space at the planning space was not a problem. - Densities were calculated which were possible.	- Was necessary in this case. - There was a wide gap. - Space was always a problem. - The densities were not feasible.	- Plot in Salt Lake were divided in such a way that the minimum plot size was decided as 2 Kottah (134 m^2) which was beyond the affordability of the LIG or MIG people. - This was because the origin plan was rejected. - Now corrective message are being taken but this has result in the future population reaching eight lakhs.

1.	2.	3.	4.
Location of work place	- A link between employment and housing was kept.	- The same problems are applicable here.	- Many people have t0 commute outside Salt Lake for work.
	- Initially to get a house it was necessary to have a job in the new town, but it could be changed later.	- No such linking of employment with place of residence was done.	- This problem could have been avoided by alloting housing and shifting the Department properly.
	- Aimed at forming a stable and self sufficient society with little movement of population and an even distribution of workers, personnels and people of different income groups.	- Initially meant to be a self contained town - but later viewed as an expansion this leading to non-uniform shifting of work places.	- Should have been planned to reduce commuting time.
Transport Net Work	- Communications with the parent city had been improved.	- Initially communications with parent city were not so good have improved now.	- One major problem is that the landuse distribution does not match with the network system.

1.	2.	3.	4.
	- Internal traffic was care duly planned due to layout as low residential density's led to. * Larger densities * Concentration in work places - Parking problems came up. - increase in motoring was under estimated.	- Internal traffic was planned for and the carriage ways are there three times more than. - A strong north south corridor was planned.	- Hierarchy of roads at the entrance of salt lake are not matched with the hierarchy and los of the approach roads from Calcutta.
Service population	Not very application here.	- Played a Master Role in in the way of life in a typical Bengal household. - Those who come are construction workers family members or those who live par off.	- This should be taken care of by providing space for service population.

1.	2.	3.	4.
Economic Viability	- Was attempted by financing of new towns by a system of long term treasury loans, repayable over sixty years at varying rates of interest.	- Not given much throught in this case. - People who could hardly afford 50 sqm of space were expected to move into plots of 134 m^2. - Present expenditure of Salt Lake is 150 lakhs while it gets back only Rs. 60 lacs.	- The aim in todays present situation should be to make such projects economically viable, even for the Govt. - This could be done by reserving comm. plots right at the beginning and then selling them at high prices. - Private investment should be encouraged in such projects. - Subsidising actual costs have not really benefitted any one.

CHAPTER 8

CHAPTER - 8

OVERVIEW AND RECOMMENDATIONS

8.1 OVERVIEW

The Garden City of Calcutta - Salt Lake renders a better quality of life to its residents with its more circulation and open space. All the lands are sold out and still there is demand for it. The lands are selling at the rate of Rs. 2 lakh per Cottah, against the original price of average Rs. 5,000/-, though the transfer of lands are not permissible here. About 23 of such transfers have come to the notice of Government, the actual number is much higher.

Inspite of these, the project has failed miserably to fulfill its objective. It has become the area for HIG people only, it serves as a dormitory to the working population of Calcutta, it could not improve the living condition of EWS or LIG population of Calcutta, it has failed to supply sufficient infrastructures to be self contained, the government offices have shifted partly and cause more confusion. The way the planning policy of salt lake is changing/modifying would cause serious problems in the future. However, in the process of planning, the government has learned many lessons. Still, Salt Lake has a lot of open scope and it brings hope to the residents of Salt Lake and Calcutta.

8.2 RECOMMENDATIONS

As per the objective of this thesis guidelines to be not on the expereinces of Salt Lake project as a part of expansion of metropolis for future such developments. For each guidelines, it has been given in general for any such project in future and for the case of Calcutta.

(a) Any such projects should be viewed as an expansion and not as a separate township as it was perceived for Salt lake initially.

(b) The extended part of the metropolis should be properly integrated with the metropolis and its surrounding areas.

To do so the project area of salt lake should be redefined to include the eight wards between upper circular road and Salt Lake reclamation area and thus a single plan should be prepared for this project.

(c) For the expansion of any metropolis, nearby such low lands or wetlands should not be disturbed. Decision should come after detailed cost benefit analysis on the project.

The West Bengal Government has decided to extend Salt lake city in the south east on 783 acres of swampy land - i.e., on Munshi's Bhari, Chintamoni Bheri. This expansion must be discouraged to maintain the eco-system of Calcutta.

(d) For decentralization of existing CBD of the metropolis, the different activities viz. government offices to be shifted completely not partially otherwise more confusion may arise, as it has happened in the Salt Lake.

(e) Setting up of more realistic development and space standards to cut down the development and construction cost so that people can effort to built housings units on developed plots with minimum subsidy.

In Salt Lake all the plots are sold out, but more than 40% is still lying vacant. Plot reconstitution techniques can be applied here to generate more affordable size plots to the people.

(f) The hierarchy of networks to be maintained in accordance with the landuse and the adjacent localities/main city. Landuse plan of Salt Lake may be modified for this.

(g) The provision of service facilities should be designed for more than the target population and land should be reserved for them.

(h) More public housing specially for low, low middle and middle class, because housing as such is economically unremunerative for them.

(i) Recognise the informal sectors, which absorbs the majority of the labour.

No separate provisions are there for informal sectors in Salt Lake as it should be.

Informal sectors are taking this advantage and are more popular to the people. It would be necessary to take the immediate steps to facilitate its progressive transition in different phases would be helpful to cover the insufficient provision in future.

(j) The organisational set up of the newly expected area to be properly integrated with the metropolis.

Salt Lake is at present, is under 24 Parganas district. It should be included under the Calcutta's administrative control, which will solve majority of the administrative problems.

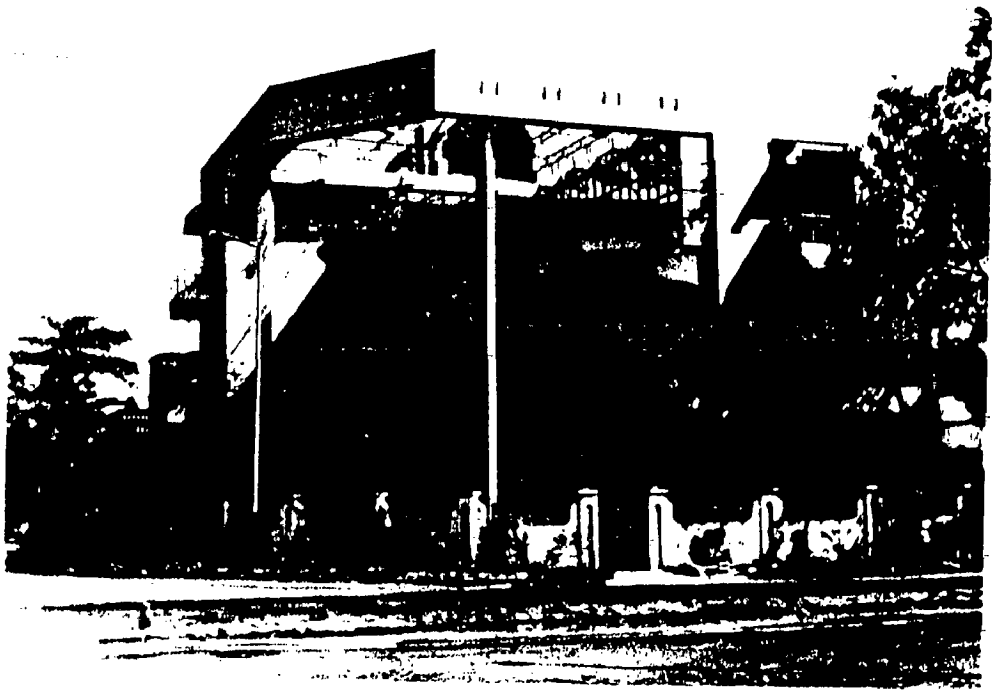
PHOTOGRAPHIC STUDY

A Panaromic View of the Government and Institutional Building as a backdrop to the Central Park

The Eastern Metropolitan Byepass Flanking Salt Lake City along its Western Edge.

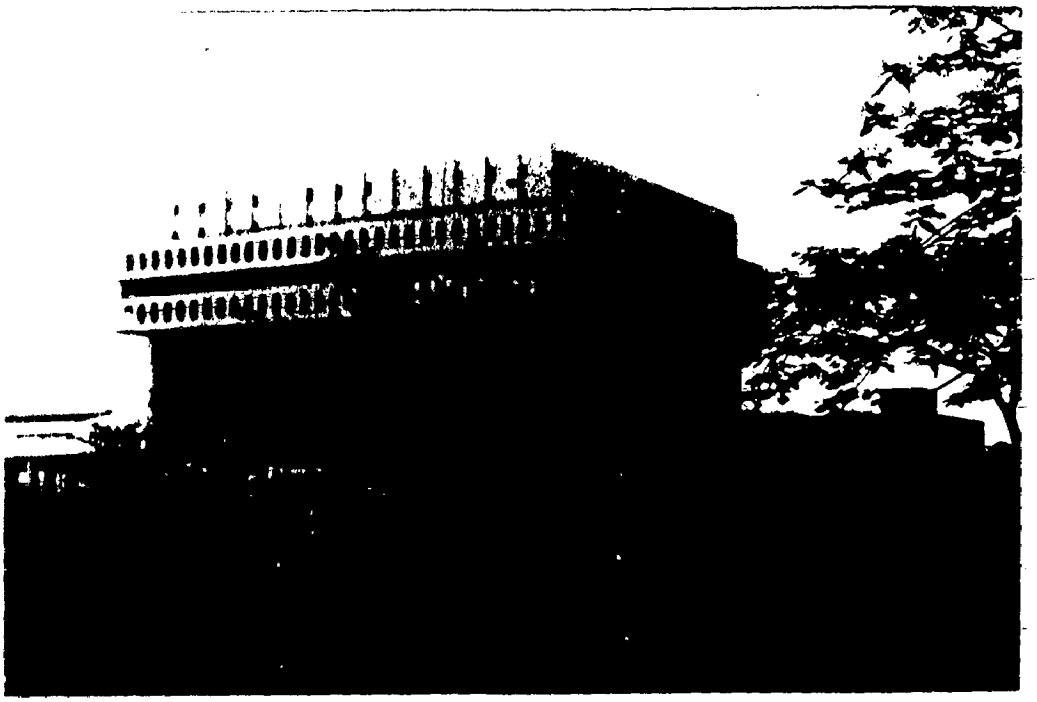
The Krishnapur Canal - The Natural Drainage Canal along the South Eastern Edge of Salt Lake.

Multistorey Development in Salt Lake



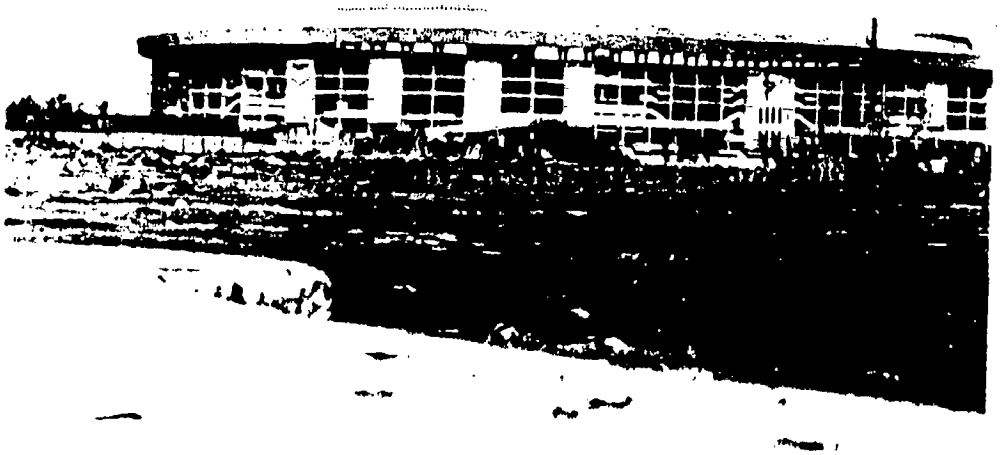
Plotted Development in Salt Lake BH Block

CPWD Office in the Institutional Block



Vidut Bhawan

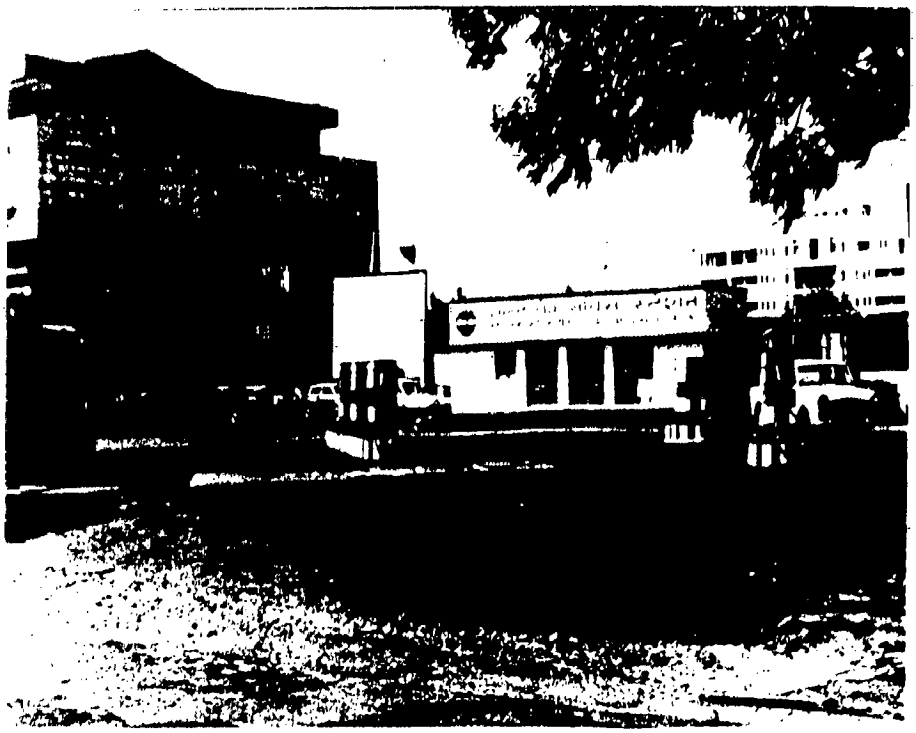
APPENDICES



The Salt Lake Stadium Profile - The Pride of Calcutta.

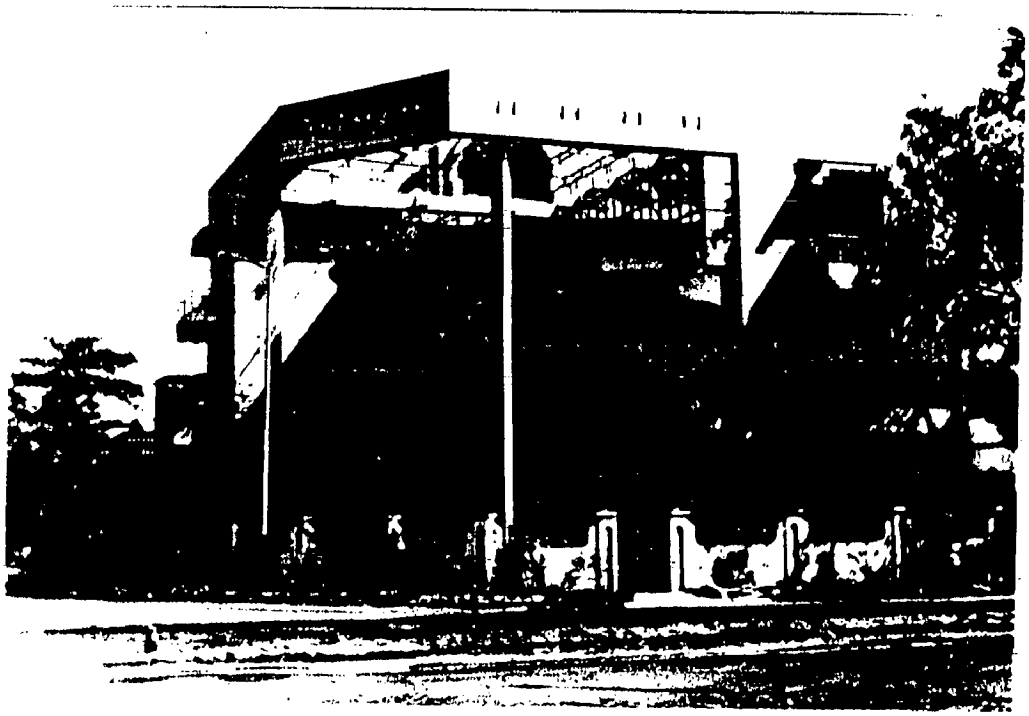
Entrance to Salt Lake Stadium from the E.M. Byepass

Local Shopping Centre of C.A. Block



Other facilities Like Salt Lake Petrol Pump cum Service Station.

Multistorey Development in Salt Lake



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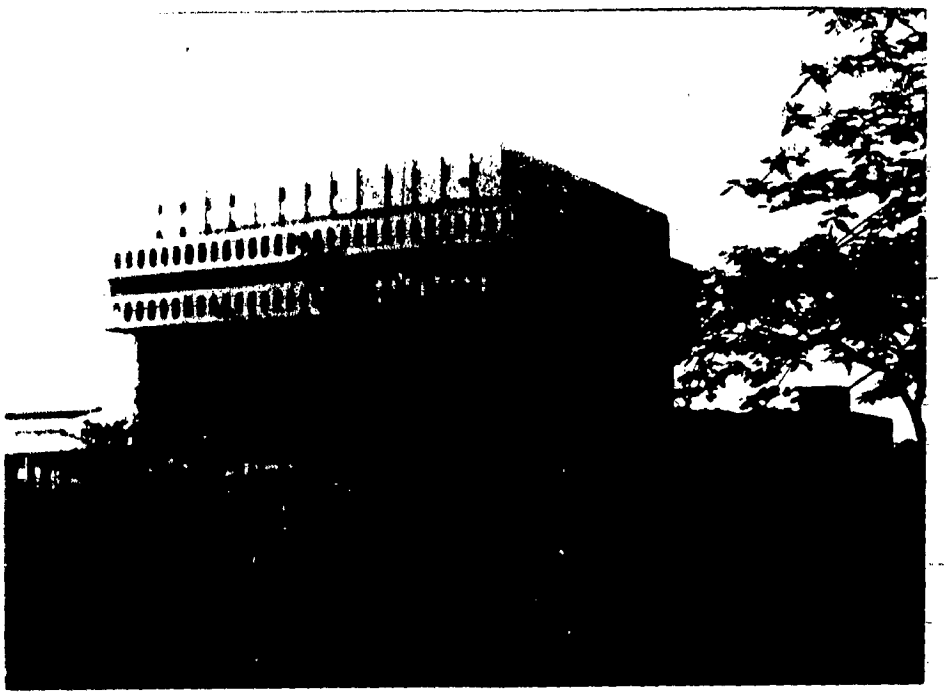


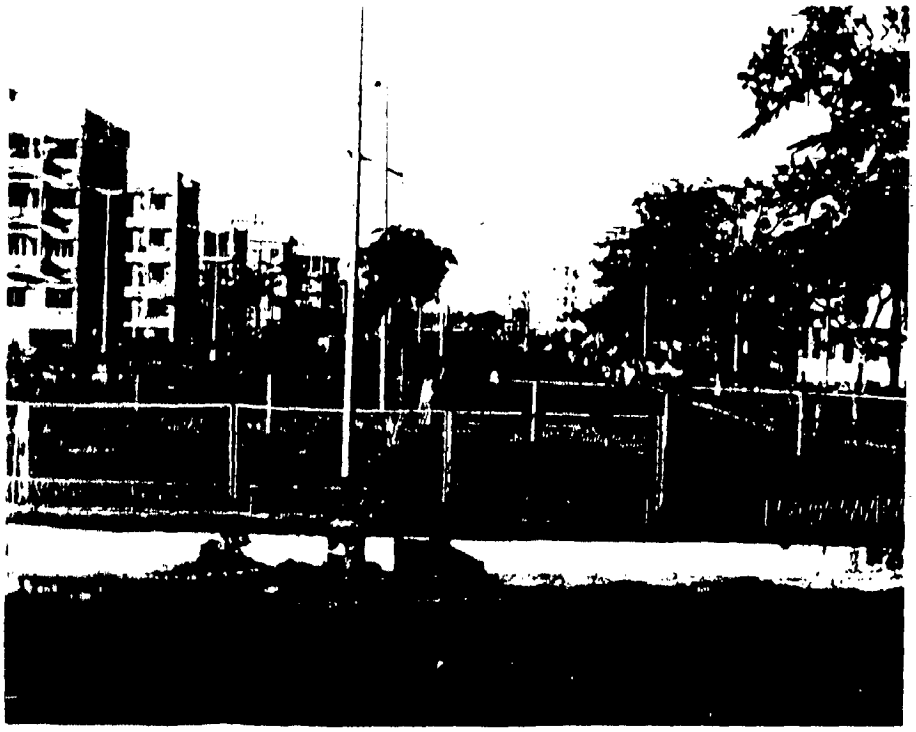
Vidut Bhawan

APPENDICES

Roadside Shops which have cropped up

View of a Typical Steet

Current Development along the Major Roads



View of the Central Activity spine fron the Central Park

HOUSEHOLD QUESTIONNAIRE

1.	Plotted-1; Flatted-2	-----
2.	Own House-1; Rented-2	-----
3.	When you bought the plot	-----
4.	When you started constructing your house	-----
5.	Have you bought the house from Govt.-1; Through power of Attorney-2.	-----
6.	Religion of the Houshold Hindu-1; Muslim-2; Christan-3; Jain-4; Others-5	-----
7.	Mother Toung by Head of the houshold	-----
8.	Nature of the Household : Mualeated-1; Joint-2; Unitary Joint-3; Extended-4	-----
9.	Occupation of the Head of the Household ; Service-1; Professional-2; Businees-3; Others-4	-----
10.	When Migrated to Salt Lake	-----
11.	Origin of Migration; Calcutta-1; Sub-Urb Calcutta-2; Other urban centre of the state-3; Village of the State-4; Outside W.B.-5	-----
12.	Place of work Within S.L. 1; Outside S.L.-2	-----
13.	Water supply at Homes 24 hrs-1/Mornining-evening shift-2; N.A.-3	-----
14.	Is it regular, Yes-1; No-2	-----

15. Supply of water : -----
Satisfactory-1,
Unsatisfactory-2,
N.A.-3

16. Quality of Water; -----
Hard-1; Stained Cloths-2;
Others-3; N.A.-4

17. Drinking water source -----
Tap-1
Tubewell-2,
Others-3

18. Source of drinking water -----
if not at home :
Within the block-1;
In adjacent Block-2;
Within Sect.

19. Do you treat the water : -----
Yes-1
No-2

20. Do you feel open spaces are
enough in the lacality : -----
Yes-1; No-2

21. Are they properly maintained -----
Yes-1
No-2

22. Children Park : -----
Within block-1;
In adjacenet blocks-2;
In Sect.-3

23. Play ground : -----
Within Block-1;
Adjacenet Block-2;
In Sect-3

24. Do you use the above 1 -----
Yes-1
No-2

25. Community Hall : -----
Within the Block-1
Adjacenet Block-2;
Sect.-3

26. Facilities available there -----

28. Is theres any Doctors Clinic in the Block. -----
Pvt-1;
Govt-2;
N.A.-3

28. Do you avail them : -----
Yes-1;
No-2

29. Health facilities in S.L. is satisfactory : -----
Yes-1;
No-2

30. Do your children avail the Educational facilities of the locality : -----
Yes-1; No-2;
N.A.-3

31. If not, why ? Not satisfactory -----
standard-1;
Enough seats not available-2;
Bengal medium-3;
Others-4.

32. Do you avail the local shopping/ marketing facilities. -----
Regular-1; Often-2;
No.-3

33. If no, where do you go; -----
Ultadanaga/Maniktala-1;
Beliaghata-2;
Others-3

34. Why do you not use local shopping -----
Expensive-1; Quality of goods not to be standard-2;
Irregular supply-3;
Others-4

35. Where do you dispose garbage : -----
Road-1;
Dustbin-2;
At home-3;
Outside-4

36. Do the Authority cleans up the garbage : -----
Everyday-1;
Alternate day-2;
In a week-3;
In a month-4

37. Are the road maintained properly : -----
Good-1;
Fair-2;
Bad-3.

38. Is there any water logging prohlems -----
Yes-1;
No-2

39. Is there enough space for car parking -----
Yes-1;
No-2

40. Nearest Bus Stop : -----
5 Min. walking dist-1;
5-10 min-2;
10-15 min-3;
Plus min-3.

41. How Is the connectivity within Salt Lake : -----
Good-1;
Fiar-2;
bad-3.

42. How is it with Calcutta -----
Good-1;
Fair-2;
Bad-3.

43. From where your domestic servant comes : -----
S.L.-1;
Outside S.L.-2.

44. How is the Law and Order situation in S.L. -----
Good-1;
Fair-2;
Bad-2.

45. Is there any Police Check post -----
In the Block-1;
Adjacenet Blocks-2;
Sect-3.

46. Do you have any vehicle : -----
Car-1;
Motor Cycle-2;
Cycle-3.

47. Monthly Income Head of the HH) -----

Sl. No.	Age	Sex M-1 F-2	Occupation Agr-1 Fishing-2 Livestock-3 Mfg.-4 H.H. Ind.-5 Other service-6 Student-7 Housewife-8	Place of work within S.L.-1 Outside SL-2	Mode of travel Travel : Car-1 M.Cycle-2 Cycle-3 Taxi-4 Bus-5 Rickshaw-6 Auto-7

OPINION SURVEY

Please put ticks (_/) in the box according to your opinion on the following facilities in Salt Lake. If you do not like to express your opinion on some of these facilities you may leave it blank.

FACILITIES	OPINION		
	GOOD	FAIR	BAD
1. Transport			
2. Shopping			
3. Schooling			
(a) Nursury			
(b) Primary			
(c) Secondary/H.S.			
(d) College			
4. Recreation			
5. Games/Sports			
6. Religion			
7. Social mixing			
8. Public services : (Bank,P.O.,PS,etc.)			
9. Sewerage/Draiange			
10. Health			
11. Environment			
12. Planning of S.L.			

COMMERCIAL QUESTIONNAIRE

1. Own shop-1; Rented-2 -----

2. When started ----

3. Type of the shop -----

4. Area of the shop -----

5. Number of workers -----

6. Are you selling the same products from the beginning : Yes-1; no-2 -----

7. What was your previous product. -----

8. Do you local people use your shop regularly : -----

   More than-1 Sect-1

   1 Sector-2; More than 6 blocks-3;

   3 to 6 blocks-4; 2 to 3 Blocks-5;

   1 Block-6.

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