

THE GENERAL LANDUSE PLANNING FOR BHEEMAVARAM CITY
WITH SPECIAL REFERENCE TO PROVISION OF SITES FOR
PERSONS AFFECTED BY FLOODS & POOR MIGRANTS

A DISSERTATION

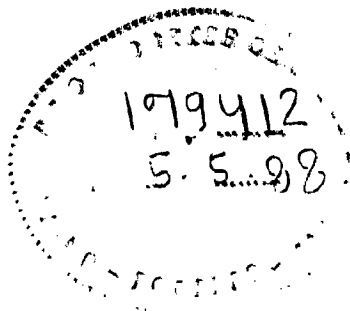
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requirements for the award of the degree

of
MASTER OF URBAN AND RURAL PLANNING

BY

R. VENKAT RAMA RAJU

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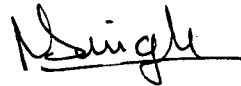
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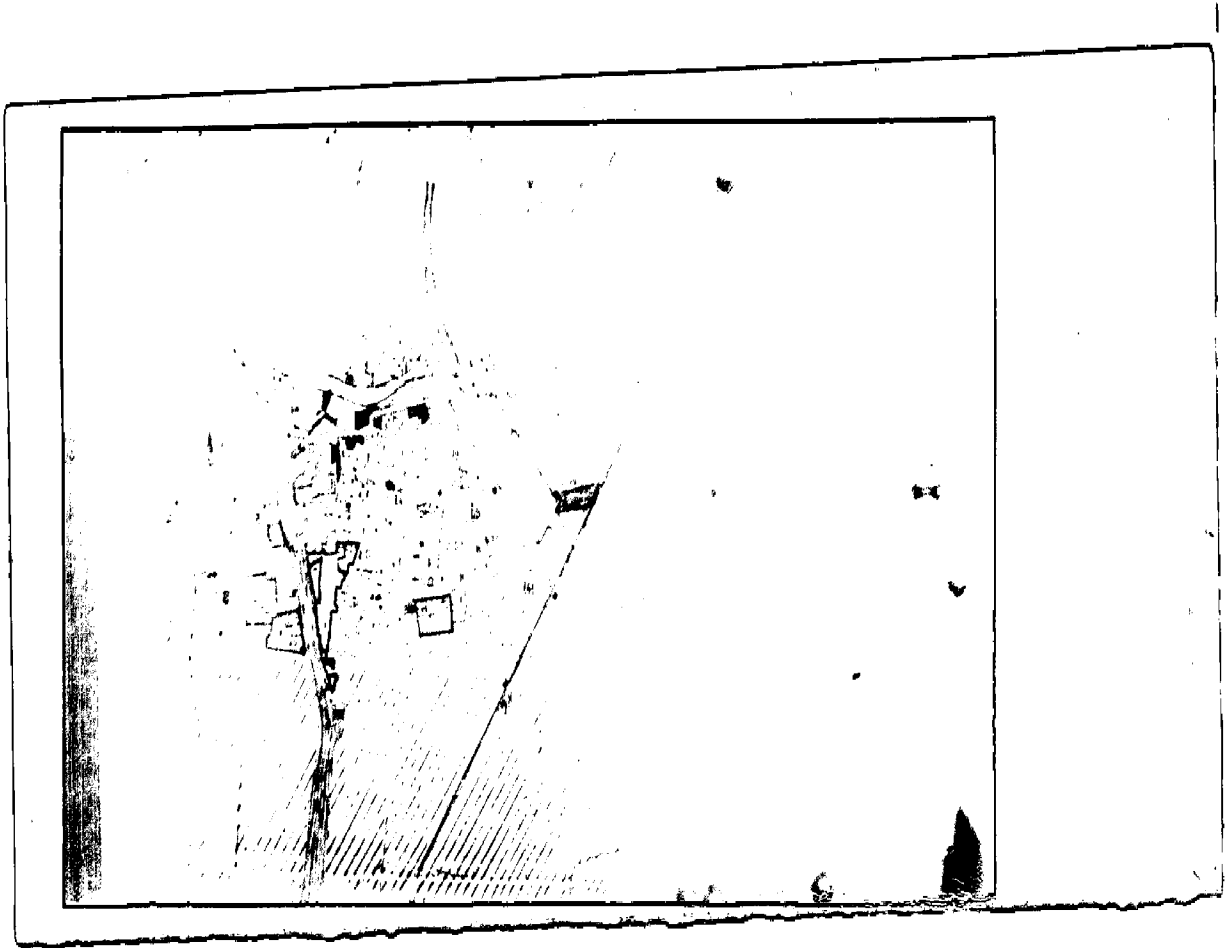
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"THE GENERAL LANDUSE PLANNING FOR BHEEMAVARAM CITY WITH
SPECIAL REFERENCE TO PROVISION OF SITES FOR PERSONS
AFFECTED BY FLOODS AND POOR MIGRANTS ", which is being
submitted by R. Venkat Rama Raju, in partial fulfilment
of the requirements for the award of Degree of MASTER
OF URBAN AND RURAL PLANNING, of University of Roorkee
is a record of students own work carried out by him
for a period of about nineteen months from August 1985
to February 1987(under my supervision and guidance).

The matter embodied in this dissertation has
not been submitted for the award of any other degree
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PHOTO, MAP 12. EXISTING LAND USE MAP

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SYNOPSIS

THE GENERAL LANDUSE PLANNING FOR BHEEMAVARAM CITY WITH SPECIAL REFERENCE TO PROVISION OF SITES FOR PERSONS AFFECTED BY FLOODS AND POOR MIGRANTS

Godavari District in Andhra Pradesh, Bheemavaram City is an important Market Town and Commercial Town. This is one of the towns identified by the State Town Planning Department for development under the 'Integrated Development of Small and Medium Towns Programme' initiated by Town and Country Planning Organisation, Government of India,

West Godavari District is one of the fertile and prosperous Coastal Districts of Andhra Pradesh, and Bheemavaram is an important Urban Centre of the Macro-region, witnessing rapid changes as a result of increased Socio-economic activities. An Outline Development Plan for Bheemavaram town, 1971-91 was prepared by the Directorate of Town Planning, A.P., long ago. The Plan is not implemented, but two shopping centres and by-pass road are taken up under I.D.S.M.T. Programme. In the mean time, this town has been subjected to the pressure of tremendous population growth and accompanying developmental problems.

The present situation necessitates improvements in land uses and the control of unintended Urban Development.

The people of the town have been affected by floods due to heavy rains in the town and in its environs and also along the Godavari River. Godavari river water enters into the town during floods now and then. The people have been migrating to the town from rural areas. The poor migrants try to occupy Government and or private lands and make slums. The slums are increasing in number in the town. Even some of the wage earners spent the time on pavements etc. Their plight is deplorable particularly in times of inclement weather. They perform some essentially required functions. Hence it is very necessary to provide sites for flood shelters cum poor migrants temporary accommodation at sector level.

SCOPE

It is intended to study the planning aspects and land uses to make forecasts for 1981 - 2001 and to provide sites for flood shelters cum poor migrants temporary accommodation within the frame work of Outline Development Plan of Bheemavaram town prepared by Directorate of Town and Country Planning.

OBJECTIVES

The objectives are as follows:

1. To study Physical Characteristics/Natural Phenomena in general.
2. To know the areas of landuses of different categories.

3. To make forecasts for landuses of different categories for 2002.
4. To provide sites for flood shelters cum poor migrants temporary accommodation within the frame work of Outline Development Plan prepared by Directorate of Town and Country Planning.

CHAPTER - 1 INTRODUCTION

The Cities in India are affected with large populations due to migration from rural areas and small & medium towns, in search of employment and or lively hood. With the aim of reducing pressure on cities, the Govt. of India - TCPO proposed I.D.S.M.T. Programme to develop small and medium towns.

In general, the towns have been developed haphazardly - mixed land uses, non conforming land uses/unintended urban development, inadequate community facilities and their improper locations, and so on.

The Bheemavaram town was small village some decades back, and there was another village called Gunupudi Village, at the side of it; and gradually increased in size, and joined with Gunupudi Village; and then these villages have grown jointly, and gradually developed to the present status. The Bheemavaram town is Taluk head quarters town of Bheemavaram taluk of West Godavari District in A.P. The population of the town according to 1971 & 1981 census are 63762 and 101894 respectively. The land uses are improperly located. The community facilities are inadequate, and also, they are not well distributed spatially.

Chapter two deals with identification of problems, scope, and methodology objectives.

Chapter three provides study of physical characteristics. Chapter four deals with regional context and hinterland. Chapter five provides study of financial

status of municipality. Chapter six deals with demographic study. Chapter seven provides study of present land uses. Chapter eight provides forecasts for the general land use plan for Bheemavaram town, 1981-2001. Chapter nine illustrates the provision of sites for flood shelters cum poor migrants temporary accommodation. Chapter ten deals with conclusions and recommendations.

CHAPTER 2 IDENTIFICATION OF PLANNING PROBLEMS, SCOPE AND OBJECTIVES & METHODOLOGY

2.1 IDENTIFICATION OF PLANNING PROBLEMS.

Bheemavaram town is taluk head quarters town of Bheemavaram taluk of West Godavari District of Andhra Pradesh State. Bheemavaram town is situated on Palakollu - Pamarru road which is major road, and also major road of Bheemavaram-Gollala Koderu - Tadepalligudem road is meeting N.H. No. 5 near Tadepalligudem, and besides Tadepalligudem Eluru (District Head Quarters) is situated on N.H. No.5 at a distance of about 83 Kms. by road and 60 Kms radially. The neighbouring towns with approximate distance are palakollu on eastern side 20 Kms, Narsapur beyond palakollu on South-eastern side-35 kms via Palakollu and 25 kms via Taderu, Tanuku on North-eastern side 30 kms by railway and 50 kms by road, Nidadavole beyond Tanuku on North-eastern side-40 kms by railway and 60 kms by road, Tadepalligudem on northern side-30 kms, Eluru (District head quarters) besides Tadepalligudem on north-western side -83 kms by road and 60 kms orthogonally Akkividu a small growth centre (at the district border) on western side - 20 kms, Kaikalur and Gudivada of Krishna District beyond Akividu 28 kms and 58 kms respectively, and so on. According to the distances to the neighbouring towns, large rural areas located within 10 kms to 15 kms distance have been depending on the town for socio-economic needs.

The people of villages of Bheemavaram taluk have been visiting the town for official/administrative purposes. The people from surrounding rural areas have been visiting the town for shopping such as fertilisers, pesticides, agricultural implements and so on for marketing agricultural produces and so on, as the fertile agricultural lands surrounding the town are provided good irrigation facilities through the Godavari river canal system, and also producing rice abundantly, and also vegetables, fruits, coconuts, etc to some extent. Hence large floating population has been visiting the town for socio-economic reasons and creating pressure and or demanding loading and boarding facilities, public utilities, shopping facilities, marketing facilities, transportation facilities and so on.

The under privileged population as well ^{as} educated youth of surrounding rural areas has been migrating to the town in search of employment and or livelihood due ^{to} in sufficient employment facilities and or population growth in rural areas. This migration has resulted the growth of population of town vastly in recent decades, and also resulted the growth of slums in the town. The population of the town is 63762 and 101894 according to 1971 and 1981 censuses respectively. There are large no of agricultural labourers mostly residing in slums and low quality dwellings who might probably migrated from

rural areas, and so creating problems in the town. The unintended urban growth has been developed in the town. The existing land uses are not properly located in the town. There are mixed land uses in the town, which resulted haphazard developments. Adequate recreational open spaces are not available in the town. The existing infrastructure facilities are inadequate.

There is housing shortage in the town. The no. of occupied houses are 19513 according to 1981 census. The housing shortage is 866 by considering the house hold size as 5, as per 1981 census.

There are several slums in the town, mostly rural poor population who migrated to the town in search of livelihood has been residing in slums. The slums located along the enamaduru drain and canal are subjected to floods, and they are suffering from dirty environment and they are polluting the canal water. The lining of enamaduru drain and canal has been damaged at some places. The slums located along the highway road margins are posing traffic hazards. The dwellers are suffering from dirty environment. Some public and private lands are occupied by some dwellers. Over crowding and congestion is found in some places such as Chinnapeta, Gunupudi.

The residential areas are mixed with other land uses, which has resulted noise nuisance, pollution, traffic problems, and so on.

Shops and business establishments are located along the most of the important streets in the town are needed to be shifted to shopping centres. There are encroachments on to the streets which has resulted traffic problems. Petty sellers on foot paths and road margins are creating traffic problems. There are trade links with regional villages and settlements. The shops are inadequate to serve the town as well as regional settlements.

Most of the existing industries are agro-based industries and service industries which are located in residential areas, and so which has resulted noise nuisance, pollution, traffic problems and so on, so needed to be shifted to the organised separate industrial areas.

Most of the roads are mixed with traffic of different types, such as pedestrians, slow moving vehicles and fast moving vehicles, and the roads are not wide enough, and so resulted traffic problems. There is no truck terminus. There are no proper parking facilities. The trucks have been parked on the road margins, so creating traffic problems. In general the road margin along palakollu - Pamarru road, margin of junction of town Rly. Station road etc are used for parking of trucks. The Palakollu-Pamarru road is congested with mixed traffic. There is traffic congestion on most of the roads. The existing bus terminus belongs to APSRTC is inadequate to serve the present buses, and also there are no passenger facilities, and also the site is under unhygienic.

Space standards are not satisfactory in many educational institutions, and also there are no adequate play fields in many educational institutions. The existing educational facilities are inadequate. Some educational institutions are structurally unsound.

The medical facilities in the existing hospitals are inadequate to serve the population. The existing no. of beds in the existing hospitals are inadequate to serve the population. The medical dispensaries are inadequate.

The existing recreational open spaces i.e. parks and fields of play are inadequate.

The cultural facilities are inadequate.

There is need to increase the quantity of water supply requirements to standard requirements. The existing surface drainage systems are needed to be improved for present as well as future development of the town.

Under the IDSMT Programme, the bye pass road, shopping complex at Thurupumala Palli and shopping and vegetable market at wednesday weekly market 52 and 73 shops respectively are sanctioned by TCPO, Govt. of India.

The people of the town have been affected by floods due to heavy rains in the town and in its environs and also along the Godavari river. Godavari river water enters into the town. The people have been migrating to the town from rural areas. The poor migrants try to occupy Govt. and or private lands and make slums. The slums are increasing in number in the town. Even some of the wage earners spent the night on pavements etc. Their plight is diplo-
rable particularly in times of inclement weather. They perform some essentially required functions. Hence it ^{is} very necessary to provide sites for flood shelters cum poor migrants temporary accommodation at sector level.

2.2 Scope:

It is intended to study the planning aspects and land uses to make forecasts for 1981-2001 and to provide sites for flood shelters cum poor migrants temporary accommodation within the frame work of out line development plan of Bheemavaram town prepared by Directorate of Town and country planning.

3 OBJECTIVES.

The objectives are as follows:

1. To study physical characteristics/natural phenomena in general.
2. To know the areas of land uses of different categories.

3. To make forecasts for land uses of different categories for 2001
4. To provide sites for flood shelters cum poor migrants temporary accommodation within the frame work of outline development plan prepared by Directorate of town and country planning.

2.4 METHODOLOGY

2.4.1 THE GENERAL PLANNING OBJECTIVES¹

The simplest definition of planning objectives in urban planning is what the people want. Finding out what the people want is not so simple. Yet this should be a planners solemn obligation first to learn the desires of the people. A primary source of public opinion information the planner should seek and that should influence his planning.

A list of General planning objectives is given here under as a reminder or check list and should be augmented as necessary to meet the situation at hand. The goals could be titled planning objectives during plan formulation, and development objectives when the plan is ready for implementation but they should remain basically the same in each case. This approach indicates the planning process continues after implementation begins.

¹Wm. H. Claire, Hand book on urban planning, Chapter - 1. Planning - the options ahead.

The General planning or development objectives are as follows:

1. Provide for anticipated landuses of various types in appropriate locations and arrangements with respect^{to} each other as the demand in the foreseeable future indicated.
2. Reserve adequate space in appropriate locations for movements of persons and objects in a transportation system and utilities systems to serve proposed land uses.
3. Analyse natural resources and plan their proper utilisation.
4. Protect valuable surface or underground resources from obstruction to access for use or extraction.
5. Preserve available sources of water and add to them where necessary to supplement supply.
6. Arrange for adequate open space in natural conditions where appropriate for man and other living creatures.
7. Establish legal means by which the above objectives are guaranteed
8. Provide for additions or revisions of the above objectives as subsequent events require.

The above list is broad and general in nature as the support they achieve from the people and their representatives.

In general, there are several fundamental objectives which are common to the desires of-us all. The major purpose of urban planning is to eliminate some of the features of urban areas that frustrate, frighten, endanger, and kill, and to improve urban living and the urban environment. The goals include better living, preparation for population increases, and orderly growth.

Several fundamental environmental and sociological objectives are common to the desires of us all. They may be labelled as livability, safety, water supply & sanitation and quiet.

The economic goals of urban planning should include, among other things, an appreciation of the law of supply and demand, a workable budget for needed improvements and provision for maximum benefit from public funds.

2.4. 2. GENERAL LAND USE PLANNING - A METHODOLOGY²

It is essential that complete and accurate data be available regarding the current use according to major classification of each tract or parcel ^{of land} should be visited and inspected to determine its actual use.

² Russell H. Aeley, Manual on Urban Planning .

The land use data should be assembled in both graphical and statistical form.

The area occupied by each land-use classification should be determined by measurement and computation. Where practical, these data should also be compiled separately for major sectors of the area. The land use areas should be related to the existing population; this relationship is usually expressed in acres of land use (according to classification) per 100 or 1000 persons. The ratios of landuse areas per unit of population are useful guide for determining future land requirements. Experience reveals that the ratios do not vary greatly over a period of many years. Some changes are naturally expected, induced by such new trends as the provision of off-street parking space, and horizontal rather than vertical industrial structures; but these ratios can be adjusted when developing estimates of future land use areas. Hence forecasts for future land use areas are to be made.

After developing estimates of future land uses requirements, a general land use plan or model should be prepared. This will indicate the location and extent of the land-use areas according to major classifications that should serve the community's needs for the period covered by the plan.

In determining the location for future land uses, thorough consideration must be given to the existing pattern of use. Land uses do change over a period of

years, and changes have been facilitated by urban renewal projects, but large industrial, commercial, and apartment developments are seldom supplanted by more restricted uses such as single-family structures (although the reverse does occur). Other factors to be considered in providing for future land uses are topography and soil conditions, existing and possible future transportation facilities highways, railways, waterways, and airports -- and feasibility of providing utilities and services. The general land use plan does not contain specific locations for different types of schools and parks, which are contained in later phases of the comprehensive plan, but it should show general location and extent of areas that should remain as open spaces.

The general land use plan normally contains more area than will actually be needed ^{for} some of the uses, especially industrial development, and is based on the premise that some vacant land and lots will always be available. However, it should indicate the approximate extent of the future community, and is a valuable guide in determining where future physical improvements should be installed and where new growth should be encouraged or restricted.

The general land use plan should not be confused with the zoning district map, although it is a valuable aid in selecting the boundaries of the different

zoning districts. The land use plan is a guide that should be considered and used by both public officials and private developers. The district map is an integral part of the zoning ordinance that is officially adopted by the legislative body -- city council, city commission etc-- and should be strictly enforced. It is one of the most effective means of assuring that the land use plan will be followed. A land use planning methodology is shown graphically here under in

FIG.No. 1.

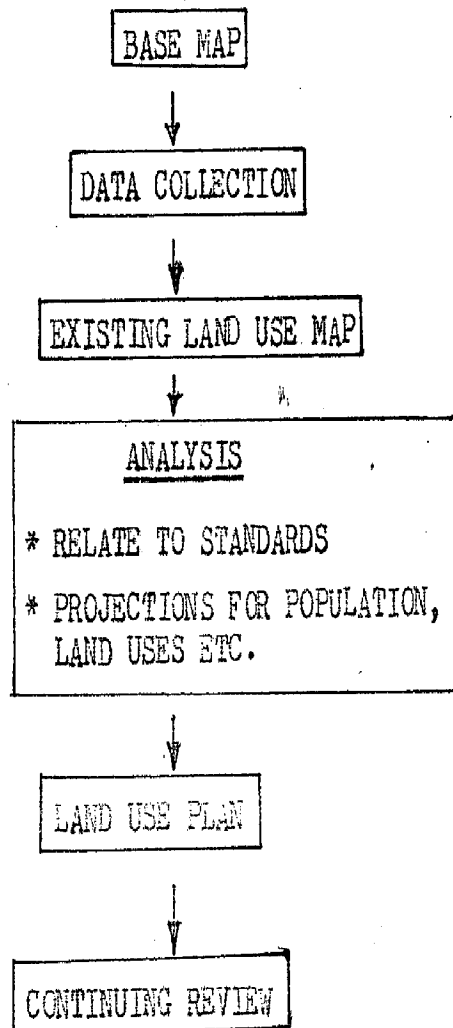


FIG. NO. 1. FLOW CHART FOR GENERAL LAND USE PLANNING³

³ Joseph DeChiara & Lee Koppel men, Urban Planning & Design Criteria.

2.4.3 METHODOLOGY FOR PROVISION OF SITES FOR FLOOD SHELTERS CUM POOR MIGRANTS' TEMPORARY ACCOMMODATION.

Forecasts for different categories of land uses for 2001 are to be made. The total area of all categories of urban land uses except the organised industrial estate should be divided by 250 acres which is sector area needed for 15000 population on average basis for the density of 60 persons per acre so as to get total number of sectors. One or two suitable sites per sector to serve about 2000 population per sector @ 7.5 acres per 1000 population per single storey building density, which comes to about 15 acres per sector are to be located within the frame work of out line development plan of Bheemavaram town prepared by Directorate of town and country planning.

CHAPTER - 3. STUDY OF PHYSICAL CHARACTERISTICS/NATURAL PHENOMENA

3.1 THE LOCATION OF TOWN

The Bheemavaram town is situated in Bheemavaram Taluk of West Godavari District of Andhra Pradesh State. The Town is situated on the Junction of Vijayawada - Gudivada - Narsapur Railway line and Narsapur - Nidadavole Railway Line; and also Palakollu - Pamarru road passes through the town. The location of Bheemavaram town in A.P. Map is shown in map No.1. The location of Bheemavaram town in West Godavari District map is shown in map No. 2.

3.2 TOPOGRAPHY

In general the town area is slopy towards South. The area along the Enamaduru drain is slightly slopy towards Enamaduru drain and then slopy towards south.

3.3 GEOLOGY ^{4 & 5}

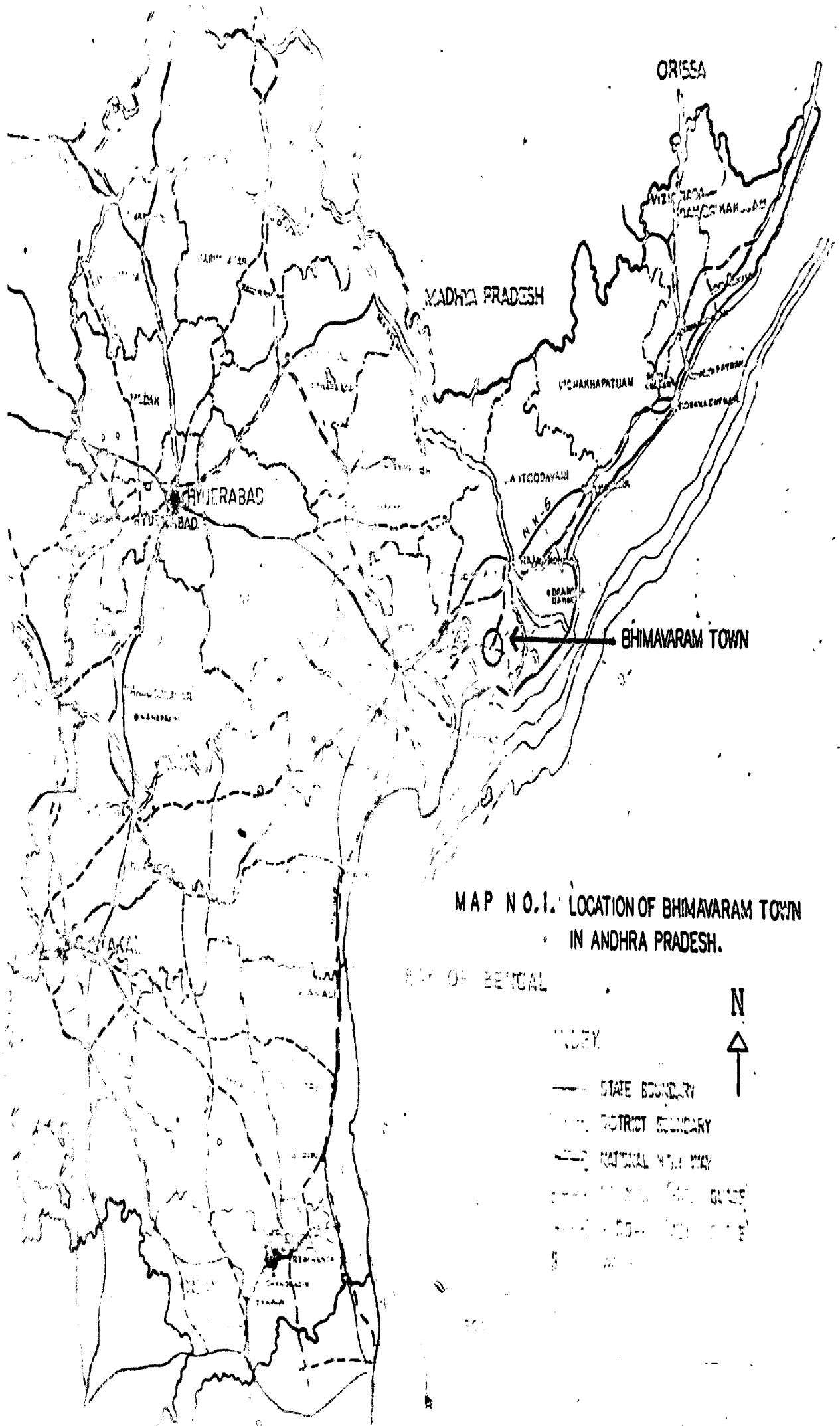
The town area is having alluvial solid and black regar soils, and so the soil is very fertile, which is very good for agricultural purposes.

3.4 CLIMATE ^{4 & 5}

The climate of the town area is characterised by an oppressive summer

4 Dr. N. Ramesan, Andhra Pradesh District Gazetteers - West Godavari .

5 Assistant Director - Planning and Statistics ; Hand book of Statistics - West Godavari District ,



MAP N O. 1. LOCATION OF BHIMAVARAM TOWN IN ANDHRA PRADESH.

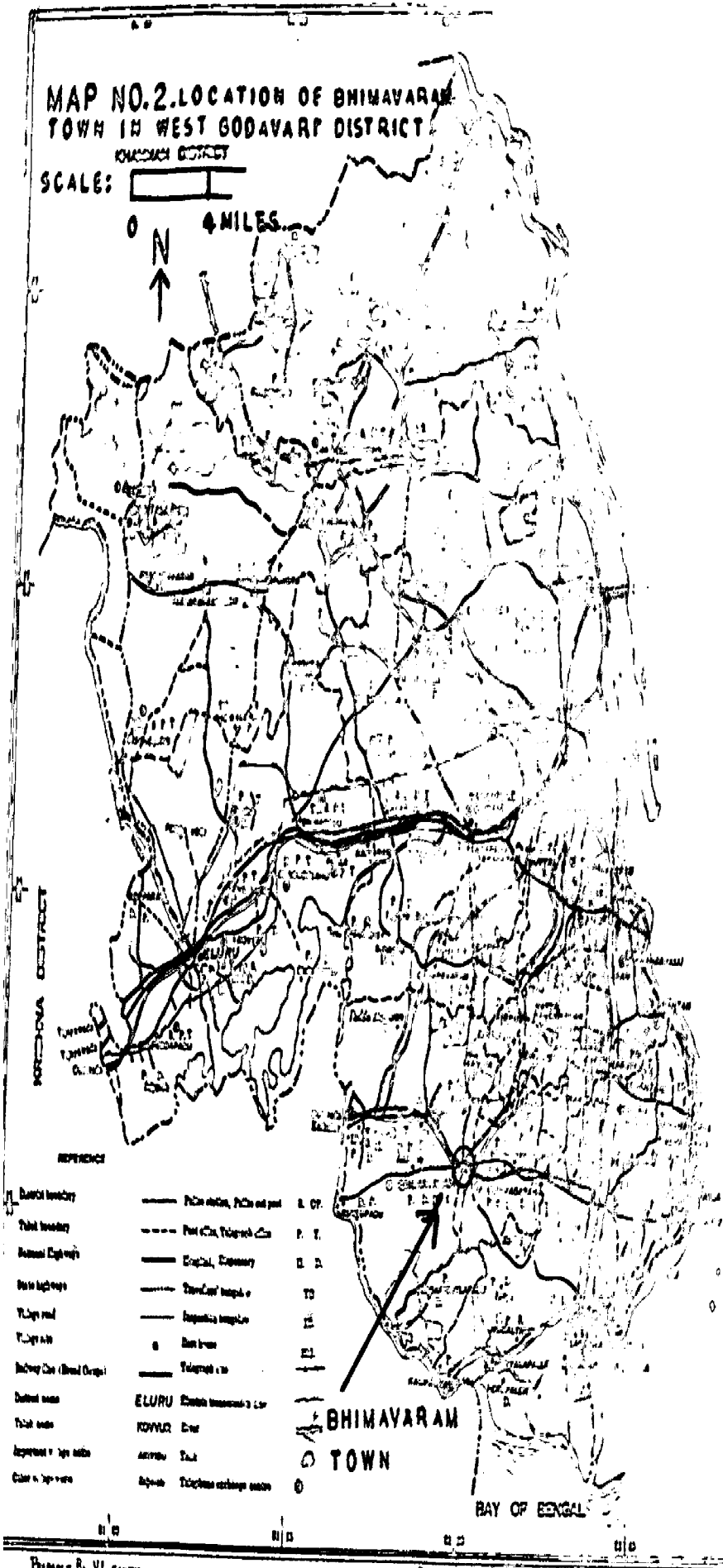
MAP NO. 2. LOCATION OF BHIMAVARAM TOWN IN WEST GODAVARI DISTRICT

WEST GODAVARI DISTRICT

SCALE: 

0 4 MILES

N



REFERENCE

Distric boundary	—— P.C. station, P.C. out post	S. O.
Taluk boundary	- - - - P. C. Sta, P. C. out post	P. T.
Railway	——— English, Company	B. D.
State Highways	——— State Govt. Highways	T. D.
T. C. Highways	——— District Highways	T. D.
T. C. Highways	○ Bus stop	T. D.
Highway (Broad Gauge)	——— Telegraph wire	T. D.
Dotted lines	ELURU District headquarters	
Taluk seats	KOVVUR Taluk	
Approved P. C. stations	▲▲▲▲▲ Taluk	
Canal & Irrigation	□□□□□ Telephone exchange station	

BHIMAVARAM TOWN

BAY OF BENGAL

Season and good seasonal rain fall. The year may be divided into four seasons. The summer season, from about the middle of February to about the first week of June, is followed by the south - west monsoon which lasts till about the end of September. October and November constitute the post monsoon or retrating monsoon season. December to mid February is the season of generally cool weather.

4 & 5

3.4.1 TEMPERATURE

The period from November to about the middle of February is the coolest part of the year, the mean daily maximum temperature being about 30°C (86°F) and the mean daily minimum about 18°C (60°F). From about the middle of February temperature begins to rise rapidly till may, the hottest month of the year with the mean daily maximum temperature at 38°C (101.1°F) and the mean daily minimum at 27°C (80.6°F). The moist heat during the Summer months is very high and the day temperature at times exceed 43°C (109.4°F) during May and early June. In the coastal parts, sea breeze which sets in the late after-noons, give welcome relief. Thunder showers in the afternoons on some days during the late summer season also give temporary relief. With the on set of

4 ibid.

5 ibid.

the monsoon by about the first week of June there is an appreciable drop in temperature and the weather becomes comparatively pleasant.

3.4.2 RAIN FALL^{4 & 5}

In general, the first four months of the year, i.e. Jan. to April are practically rain less. The rain fall increases in general from the south-west towards the North-east. The rain occurs during the South-west monsoon and post monsoon seasons. During the recent past years the total rain fall of the year varied from 684 mm to 1418mm. The rain fall during the south-west monsoon season i.e. June to September constitutes about 67 percent of the annual rain fall, while the retreating monsoon season accounts for about 23 percent. July is the rainiest month.

3.4.3 HUMIDITY⁴

The air is humid through out the year, being more so in the coastal region. The driest part of the year is the period from February to May or early June. In general, the relative humidities during February to early June varies between 45% and 55%. In general the maximum humidity occurs during September, some times raises to 80%.

⁴ ibid.

⁵ ibid.

3.4.4 CLOUDINESS¹

21

During the South-west monsoon the skies are heavily clouded and moderate cloudiness exists during post monsoon season. In the rest of the year the sky is clear or lightly clouded.

3.4.5 SPECIAL WEATHER PHENOMENA⁴

During Storms and depressions originating in the Bay of Bengal during the post monsoon months pass through causing wide spread heavy rain and strong winds. Thunder storms occur during the period March to October.

3.4.6 WINDS⁴

Winds are generally light with some strengthening in force in the south west monsoon season. In the period from October to March winds blow mostly from directions between north and north-east in the mornings and from the south or south-east in the evenings. During the summer season, the winds in the morning blow mainly from the south and from the south-east, or south in the afternoons. South-western to western winds prevail in the south-west monsoon season.

3.5 VEGETATION

There are some trees here and there in the town area. In general, the trees are less in the town. The surrounding areas of the town are agricultural lands. There are horticultural trees in the agricultural lands of the town. Rice crop is main crop in the surrounding areas of the town.

4.1 REGIONAL SETTING OF THE TOWN

The Bheemavaram town is situated in Bheemavaram taluk of West Godavari District of Andhra Pradesh State. The town is developed along the Palakollu Pamarru Road. The Godavari river is flowing along the Eastern border of West Godavari district. The distance to the sea varies from 20 kms to 30 kms. Approximately. There is Kolleru lake between Bheemavaram town and Eluru town (District Head Quarters). The neighbouring towns are Palakollu on eastern side, Narsapur beyond Palakollu on South eastern side, Tanuku on North eastern side, Nidadavole beyond Tanuku on North-eastern side, Tadepalligudem on Northern side, Eluru (District Head Quarters) beside Tadepalligudem on north western side, Akividu a growth centre (at district border) on western side, Gudivada of Krishna District beyond Akividu on Western side, and so on.

4.2 SOCIO-ECONOMIC/PLANNING LINKAGES

4.2.1 REGION'S INFLUENCE/IMPACT ON THE TOWN

The people from about 84 villages of Bheemavaram taluk have been visiting the town for administrative purposes. The people of rural

areas have been using the facilities of the town such as medical hospitals, mostly college level educational facilities, marketing facilities and so on. Approximately 40% of the total employees of the town are commuting from surrounding villages situated within 10 kms radius, by buses, scooters, cycles etc. There is no other town within 15 kms radius and also, the towns are located above the distance of 20 kms. So people of large rural areas are depending on the town for socio-economic needs.

The fertile agricultural lands surrounding the town are provided good irrigation facilities through the godavari river canal system, and so producing rice abundantly, as well as vegetables fruits coconuts etc to some extent. There^{are} trade links with surrounding villages and towns. Above 150 buses are moving through/from the town to the surrounding areas.

Large No. of under-privileged/poor population of surrounding rural areas have been migrating to the town in search of lively hood. This migration has resultedⁱⁿ the growth of population of town vastly in recent decades.

The floating population and migration population have been creating pressure on public utilities, transportation facilities, etc., and also demanding these facilities. Hence the surrounding region has impact/influence on the town.

4.2.2 TOWN'S INFLUENCE/IMPACT ON THE REGION

The administrative facilities pertaining to taluk head quarters have been providing administrative services to the villages of the taluk. The whole sale facilities like agricultural marketing yard, F.C.I. Storage, etc. are serving rural areas. The shopping facilities fertilisers, pesticides, agricultural implements, etc have been serving rural areas, Hence the town has been serving the rural areas with different facilities. Hence the town has influence/impact on the region.

4.3 HINTER LAND OF THE TOWN

In general, the different facilities of the town have different service area boundaries. For general planning purposes the distances to the immediate surrounding towns could be considered for delineating hinter land boundary. The half of the total distance to the immediate surrounding towns could be taken as boundary

limit. The towns are located above 15 kms radius, and within about 30 kms radius. So for general planning purposes the hinter land boundary could be taken as 15 kms. radius as maximum, 10 kms radius as minimum.

5.1 MUNICIPALITY SET UP

The Municipality was constituted in the year 1948 for Bheemavaram town, and later after some years it became special grade Municipality.

5.2 RECEIPTS AND EXPENDITURE OF MUNICIPALITY

The municipality maintains receipts and Expenditure under various heads of accounts such as general account, Lighting account, Elementary Education account, Water supply and drainage account, Town planning account, Deposit and advance account and so on. The total income and total expenditure are approximately equal in the past years. The available municipality finances are not adequate for the implementation of projects of poor migrants temporary accommodation cum flood shelters. Other methods for sources of finances are also adopted. As sample study and general idea of the receipts and expenditure of Municipality for some years are given in table No. 1.

TABLE - 1. RECEIPTS AND EXPENDITURE OF MUNICIPALITY

27

Y E A R	TOTAL			
	RECEIPTS		EXPENDITURE	
	ORDINARY	CAPITAL	ORDINARY	CAPITAL
1976-77	53,97,193	18,19,690	32,79,648	16,26,737
1977-78	48,93,579	30,52,669	40,84,645	27,62,459
1978-79	59,97,897	41,43,223	60,61,950	46,81,867

SOURCE :: MUNICIPALITY OF BHEEMAVARAM TOWN

6.1 POPULATION GROWTH

The population of the town has been growing vastly. The population of the town since 1931 to 1981 increased by about 10 times. The 1981 population is 101894, the decade variation is 38132, the percentage variation is + 59.80

The population growth during last decades are given in Table No. 2

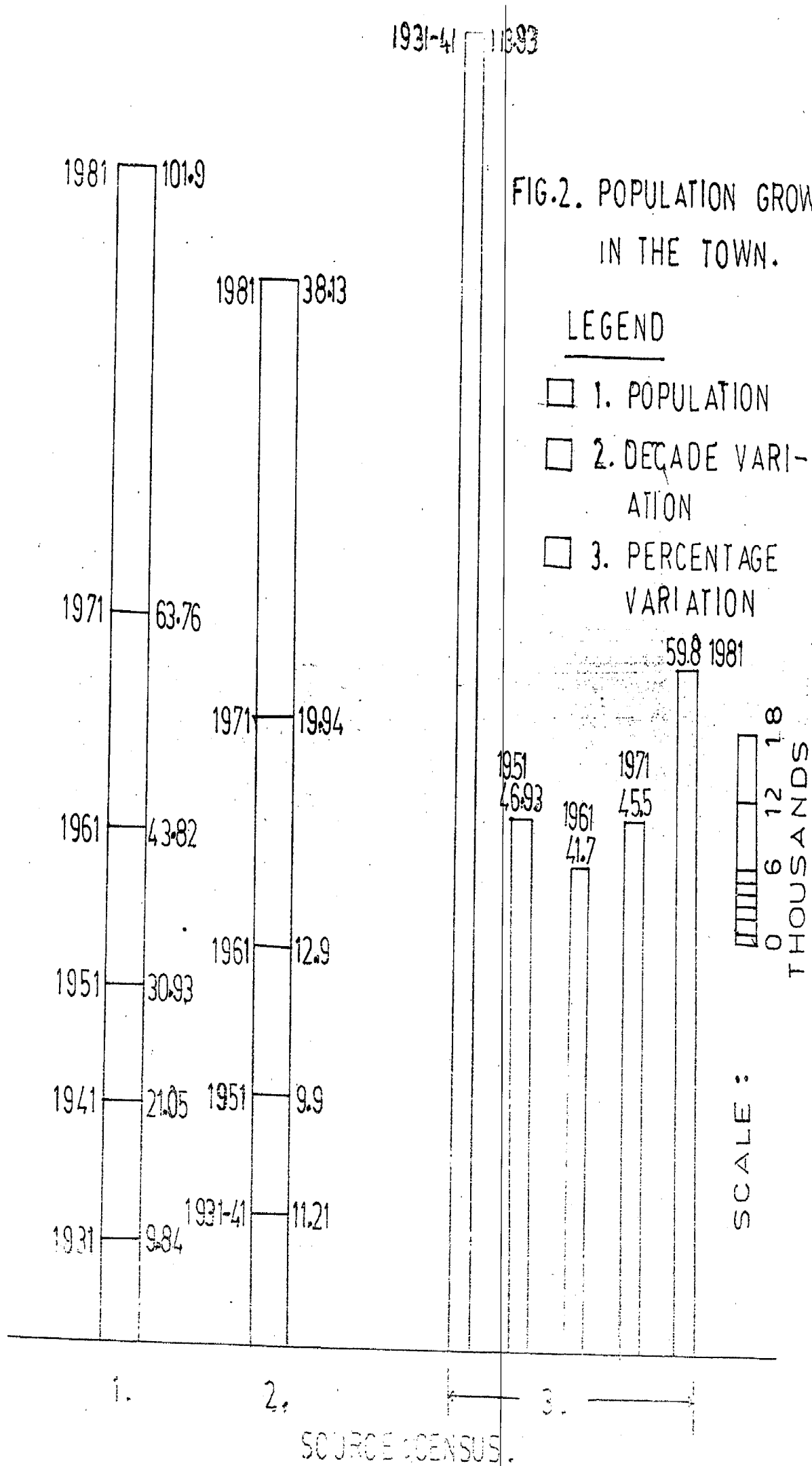
TABLE - 2 POPULATION GROWTH OF BHEEMAVARAM TOWN

Census Year	Total Population	Decade Variation	Percentage Variation
1931	9,839	---	---
1941	21,049	+ 11,210	+ 113.93
1951	30,928	+ 9,879	+ 46.93
1961	43,821	+ 12,893	+ 41.69
1971	63,762	+ 19,941	+ 45.51
1981	1,01,894	+ 38,132	+ 59.80

SOURCE: CENSUS REPORTS

Population growth in the town is shown in figure No. 2.

6 Director, District Census Hand book - West Godavari District - 1981.



SOURCE: CENSUS.

6.2 POPULATION DISTRIBUTION AND DENSITY

30

The population is distributed throughout the town since the houses are dispersed in the town. Almost all the buildings are single storey structures, and there are double and triple storied buildings here and there in the town. As per 1981 census, the number of houses, number of house holds and the population are 19,513; 21,260; 1,01,894 respectively. The average population density in the built up area is about 95 persons per acre.

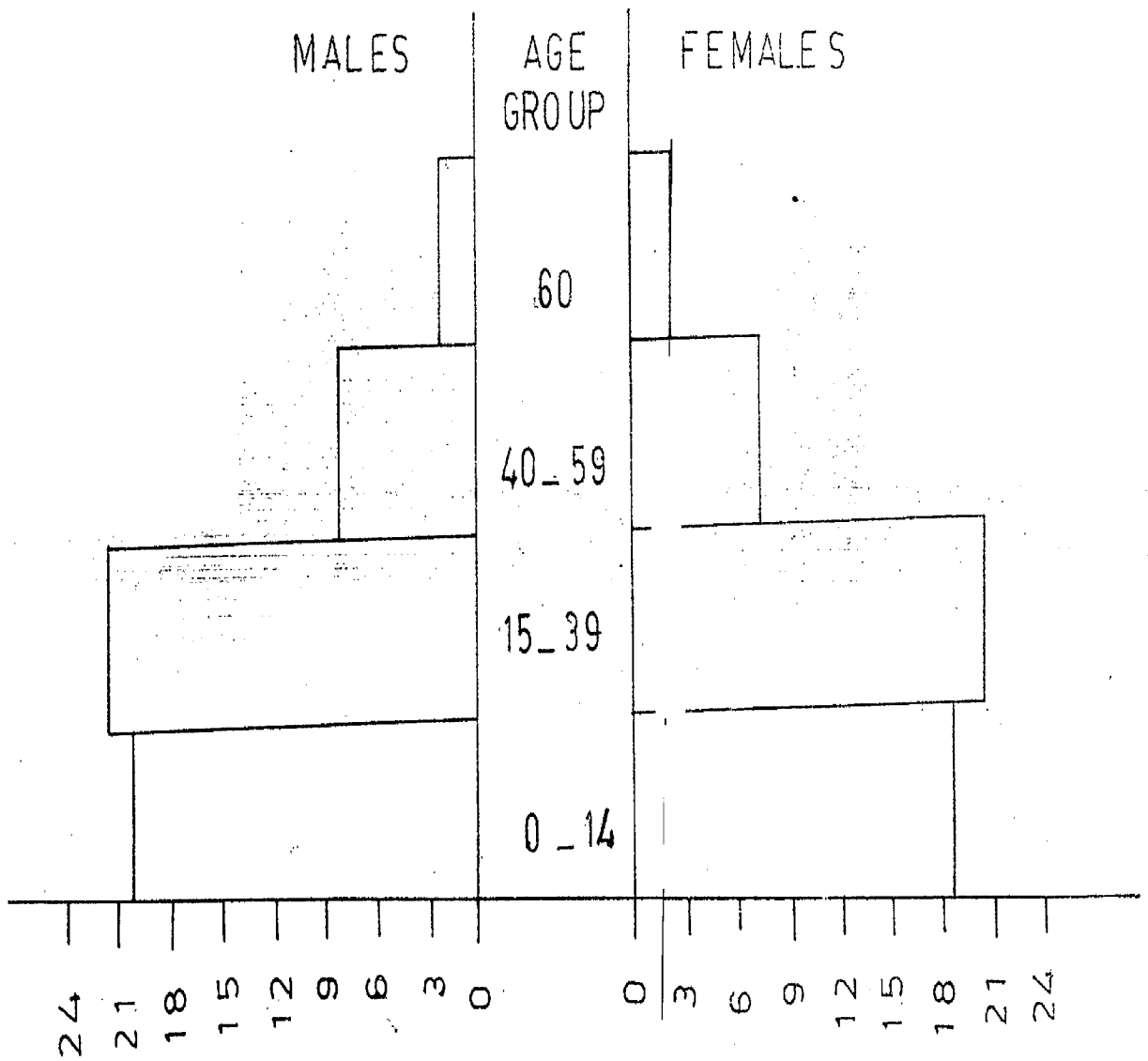
6.3 AGE GROUPS & SEX RATIOS⁶


The sex ratios of all age groups are 951 and 933 females per thousand males as per 1971 and 1981 census reports respectively. The age groups and sex ratios in the town area^{are} given in the table No. 3. The age groups and sex ratios are shown in Fig. No. 3.

6.4 BIRTH RATE & DEATH RATE

During 1971 to 1981 the approximate average birth rate, death rate and net increase rate due to births & deaths per 1000 population are 39.62, 11.44, 28.18 respectively. As sample study the year wise birth rates and death rates are give Table -- 4.

FIG. 3. AGE GROUPS AND SEX RATIOS OF THE TOWNS' POPULATION—1981



SCALE:  0 3 6 9 12 PERCENT

SOURCE : CENSUS

TABLE - 3. AGE GROUPS & SEX RATIOS OF TOWN'S POPULATION

32

CENSUS YEAR	AGE GROUPS VERSUS			SEX RATIOS	
	0 - 14	15 - 39	40 - 59	60 + ALL AGES	
1971	962	969	854	1046	951
1981					933

TABLE - 4. BIRTH RATE & DEATH RATE IN THE TOWN

S.No.	Year	Total births	Total deaths	Net Natural increase.	Birth rate per 1000	Death rate per 1000	Net Natural Increase per 1000
1.	1971	2,683	676	2,007	42.1	10.6	31.5
2.	1972	2,690	769	1,921	40.9	12.1	28.8
3.	1973	2,443	739	1,704	36.1	10.9	25.2
4.	1974	2,646	832	1,814	37.9	11.9	26
5.	1975	2,952	844	2,108	41.1	11.7	29.4

SOURCE : MUNICIPALITY

6.5 MIGRATION

The people have been migrating to Bhee 'aram town for employment, education, business and other purposes. The average population growth is found to be 4000 per year during 1971 to 1981 and the average net natural increase is found to be 2000 per year, so the average net migration is found to be 2000 per year during 1971 and 1981.

6.6 LITERACY⁶

The total literates are 44.56 percent, the literates among males are 47 percent and the literates among females are 37.18 percent in the town. The literacy percentages of the West Godavari District are 36.57% to 31.59% to total population, 41.5% among males, 31.59% among females, hence these literacy percentages are lesser than the literacy percentages of the town. The percentages of literates are given in table No. 5.

⁶ ibid.

TABLE - 5 THE LITERATES IN THE TOWN

34

YEAR	PLACE	PERCENTAGES OF LITERATES		
		PERSONS	MALES	FEMALES
1. 1971	THE TOWN	52.1	59.5	44.2
	W.G.DIST.	34.4	40.4	28.3
2. 1981	THE TOWN	44.56	47.00	37.18
	W.G. DIST.	36.57	41.50	31.59

6.7 OCCUPATIONAL STRUCTURE/ECONOMIC BASE⁶

According to 1981 census, the percentage of work force to total population is 33.67. The total workers in the town are 34,308 persons., among them cultivators are 1492 persons which is 4.35%, agricultural labourers are 8,276 persons which is 24.12%, house hold and manufacturing industry etc. Workers are 1,120 persons which is 3.26% other workers are 23,420 persons which is 68.26% and the marginal workers are 1,128 persons which is 3.29% . Occupational distribution of workers of the town are given in table No.6.

⁶ *ibid.*

TABLE - 6 OCCUPATIONAL DISTRIBUTION OF WORKERS OF THE TOWN

S.NO.	CATEGORY	NO. OF WORKERS	PERCENTAGE OF WORKERS TO TOTAL WORKERS
1.	CULTIVATORS	1492	4.35
2.	AGRICULTURAL LABOURERS	8,276	24.12
3.	HOUSE HOLD & MANUFACTURING INDUSTRY ETC.	1,120	3.26
4.	OTHER WORKERS	23,420	68.26
5.	MARGINAL WORKERS	1,128	3.29
* TOTAL WORKERS		34,308	
* PERCENTAGE OF TOTAL WORKERS TO TOTAL POPULATION			33.67

SOURCE: WEST GODAVARI DISTRICT CENSUS HAND BOOK-1981.

CHAPTER 7. STUDY OF PRESENT LANDUSES.

7.1 RESIDENTIAL

7.1.1 THE HOUSING SITUATION⁵

According to 1981 census, the number of occupied houses are 19,513; the number of house holds are 21,260; the house hold size is 4.8; and the backlog is 866 houses. The number of houses are given in Table No. 7.

TABLE - 7. THE NUMBER OF HOUSES IN THE TOWN

CENSUS YEAR	POPULATION	NO. OF OCCUPIED HOUSES	NO. OF HOUSE HOLDS	HOUSE HOLD SIZE	HOUSING SHORTAGE (BACKLOG)
1961	43,821	6,873	9,330	4.7	1,891
1971	63,762	11,523	13,988	4.6	1,229
1981	1,01,894	19,513	21,260	4.8	866

SOURCE: CENSUS REPORTS

⁵ ibid.

7.1.2 HOUSING SCHEMES COMPLETED BY DIFFERENT AGENCIES 37

Low income group housing scheme of municipality in a site of 2.93 acres; Scavengers and sweepers colony scheme of municipality - 47 tenements; Bheemavaram house building co-operative society's Housing scheme in a site of 21 acres; R.T.C. STAFF QUARTERS SCHEME - 3 blocks of 4 quarters each; Railway Employees Quarters scheme etc., are completed many years ago.

7.1.3 SLUM AREAS⁷

There are several slums in the town. Some important slums are Thurupu Malapalli slum which has 92 huts and 550 population, Pedapeta Harijan locality slum which has 110 huts and 800 population, Mentavari Thota slum area which has 42 huts and 500 population, Slaughter house road slum area which has 87 huts and 650 population, Gunupudi harijan locality slum which has 39 huts and 852 population, Pothulavari street harijan locality slum which has 48 huts and 550 population, Gareebupeta harijan locality slum which has 136 huts and 804 population. The details of the slums areas are given in table No.8.

⁷ Director, Draft outline Development plan for Bheemavaram.

TABLE - 6 THE SLUMS IN THE TOWN

38

NAME OF SLUM	LOCATION		APPROXIMATE SITE AREA IN ACRES.	APPROXIMATE NO. OF HUTS	APPROXIMATE POPULATION.
	WARD NO.	BLOCK NO.			
1. THURUPUMALA PALLI SLUM	D	11	0.77	92	550
2. PEDAPETA HARI- JAN LOCALITY	D	21	5.00	110	800
3. MENTAVARI THOTA SLUM AREA	D	22, 23	1.50	42	500
4. GUNUPUDI HARI- JAN LOCALITY	F	10	4.00	39	852
5. GURUVUPETA HARI- JAN LOCALITY	F	42,43, 44	9.66	136	804
6. SLAUGHTER HOUSE SLUM AREA	D	23	1.47	87	650
7. POTHULAVARI STREET HARIJAN LOCALITY	F	36	4.10	48	550
TOTAL:			26.50	554	4,706

SOURCE: REPORT ON OUT LINE DEVELOPMENT PLAN FOR THE BHEEMAVARAM TOWN.

7.2 COMMERCIAL

39

7.2.1 RETAIL TRADE

8

7.2.1.1 WEEKLY MARKETS CUM SHOPPING CENTRES BELONGING TO MUNICIPALITY

The two weekly markets, such as wednesday market and Sunday market were established long ago. There are some shops in these markets.

Under I.D.S.M.T. Programme one double storeyed shopping complex of about 73 shops at Wednesday market, and one double storeyed shopping complex of about 52 shops at Sunday market were developed.

7.2.1.2 OTHER SHOPS

There are shops here and there dispersed in the town, and approximate number of these shops are 2,250.

7.2.2 WHOLE SALE TRADE

7.2.2.1 AGRICULTURAL MARKET YARD & STORAGE

The agricultural market yard & storage belonging to agricultural marketing committee was established. It is serving as whole sale marketing yard to the surrounding rural areas.

7.2.2.2. F.C.I. STORAGE

Food Corporation of India Storage is established in the town, which has been purchasing food grains.

7.2.3 BANKS

There are about 13 banks in the town, such as Andhra Bank Ltd, 2 Branches; Indian Bank, Canara Bank, Bank of Baroda, Vijaya Bank, 2 Branches; State Bank of India, State Bank Agricultural Development Bank, State Bank of Hyderabad, Central Bank of India, Krishna Co-op. Central Bank, Co-op. Land Mortgage Bank, Co-op. Urban Bank etc.

7.2.4 HOTELS

There are some hotels dispersed in the town. Most of these hotels are either boarding hotels or boarding cum loading hotels, and also, lodges also existing.

7.2.5 CINEMA THEATRES (PREDOMINANTLY COMMERCIAL NATURE)⁷

There are about 14 Cinema Theatres, Mostly concentrated along Falakollu - Pamarru Road. The Cinema Theatres are Sri

⁷ Ibid.

Satyanarayana Talkies, Govardhana Picture Palace, Satyanarayana Picture Palace, Nataraj Theatre, Venkata Rama Talkies, Sri Lakshmi Talkies, Swamiji's Talkies, Maruthi Talkies, Padmasree Picture Palace, Srinivasa Mahal, etc.

7.3 INDUSTRIAL

7.3.1 THE STUDY OF INDUSTRIES⁷

In general, the industries established in this town are agro - based, such as rice mills, oil mills, as well as service industries like automobile repairing and servicing, work shops etc. which are small scale industries, and these industries are located all over the town. Many automobile repair and servicing units are located along the important roads of the town, Mostly along the Palakollu Panarru road.

The general type of industries versus their number are as follows

in Table No. 9.

7.3.1.1

TABLE-9. THE GENERAL TYPE OF INDUSTRIES VERSUS THEIR NUMBER

S.NO.	TYPE OF INDUSTRY	APPROX NUMBER
1.	RICE, FLOUR, & OIL MILLS	59
2.	WORKSHOPS, ELECTRICAL WORKS, MOTOR WORKS, ETC.	45
3.	PRINTING PRESSES	10
4.	COFFEE WORKS	2
5.	SAW MILLS	5
6.	OTHER INDUSTRIES	7
	TOTAL:	128

7.3.2 INDUSTRIAL AREA UNDER DEVELOPMENT

The A.P. Industrial Infrastructure Corporation has acquired a site for industrial area, and the development has been progressing.

7.4 TRANSPORT & COMMUNICATION

7.4.1 RLY. STATIONS & TRACKS

There are two Rly. Stations in the town such as Town Station and Junction Station, and the distance between these stations is about 2 kms.

There are 3 Broad gauge Rly. tracks connecting the town to the surrounding areas, such as Bheemavaram to Gudivada, Bheemavaram to Nidadavole, Bheemavaram to Narasapur.

7.4.2 ROADWAYS

7.4.2.1 BUS TERMINUS

There is A.P.S.R.T.C. Bus Stand in the town and about 150 buses per day move through and from the bus stand. A new site for the construction of new A.P.S.R.T.C. Bus terminus is acquired and is going to be constructed. There is A.P.S.R.T.C. Bus depot in the town.

7.4.2.2 REGIONAL ROADS⁷

44

The Regional Roads which connect the town to the surrounding areas are as follows:

1. Bheemavaram - Gudivada - Pamarru Road leading to Vijayawada.
2. Bheemavaram - Palakollu - Narsapur Road
3. Bheemavaram - Gollalakoderu - Tadepalligudem Road
4. Bheemavaram - Palakollu - Tanuku Road
5. Bheemavaram - Taderu - Narsapur Road
6. Bheemavaram - Juvvala Palem Road
7. Bheemavaram - Kumudavalli Road

7.4.2.3 PRESENT ROAD PATTERN⁷

There are many circulation roads in the town maintained by Municipality, and also Regional Roads which are maintained by P.W.D. These roads are serving as circulation roads. The total length of circulation roads is about 67 kms. In general, the roads surfaces are constructed with different materials. The roads of various categories of surfaces are cement concrete roads, bituminous roads, Gravel roads etc.

7.4.2.4 THE ROAD PATTERN UNDER CONSIDERATION, AS WELL AS BYPASS ROAD UNDER DEVELOPMENT.

Many circulation roads are under consideration for widening and improvement.

The Bypass road is considered under I.D.S.H.T. PROGRAMME TO Develop, and so this road is under development. The other traffic segregation roads are under consideration to develop,

7.4.3 WATER WAYS

The Gosthanadi - Velpur canal of the Godavari River anicut system has been used as inland water transportation facility.

The Launch services are available from Bheemavaram to Gollapalem etc. These launch services have been serving both for passenger traffic and goods traffic.

7.4.4 TELEPHONE EXCHANGES AND TELEGRAPH OFFICES, ETC.

There is a Telephone Exchange in the town, and the approximate number of telephone connections are about 750.

There is a Telegraph office in the Main Post Office of the town.

The Post Offices available in the town are a Main Post Office and about 9 Sub Post Offices.

7.5 PUBLIC UTILITIES

7.5.1 WATER SUPPLY INSTALLATIONS⁷

The G.V. Canal is the water source. Raw water is being pumped from G.V. Canal to the Head water works at Vissakoderu, and after filtration the water is being pumped in to service reservoirs and distributed to the town. The water supply scheme was designed to serve the population of 1 lakh at the rate of 15 gallons per head per day. The Rapid Gravity Filtration Plant is available at filtration works. The capacity of service reservoir is 2.5 lakh gallons. At present 6 lakh gallons of water is being supplied to the town per day which comes to about 6 gallons per head per day. So this supply is inadequate.

⁷ *ibid.*

7.5.2 DRAINAGE INSTALLATIONS & SOLID WASTE DISPOSAL.

The open drains are serving as drainage system in the town.

The capacity of drains is not adequate.

There are trailers etc. to carry waste materials to the disposal sites.

7.5.3 POWER INSTALLATIONS

There are high tension lines and low tension lines in the town.

There are transformers in the town. The sub station is located out side of the town. The new sub station is coming up in the town.

7.6 PUBLIC & SEMI PUBLIC

7.6.1 ADMINISTRATIVE OFFICES³

The administrative offices pertaining to Taluk Head Quarters are available in the town and also some State Govt. Offices etc, in the town. The total number of offices are 25 approximately.

7.6.2 EDUCATIONAL FACILITIES

48

7.6.2.1 NURSERY SCHOOLS

There are no specific Nursery schools in the town.

7.6.2.2 PRIMARY SCHOOLS

There are about 31 primary schools distributed in the town. Out of 31 primary schools 25 schools belongs to Municipality and the remaining are private schools. Many schools have very less site areas and most of the schools don't have play areas. The primary schools with areas are given in table No.10.

TABLE-10 THE PRIMARY SCHOOLS IN THE TOWN.

S.No.	Ward	Name of primary school	Area of site in Sq.mts.	No. of students.
1.	A	Sivaraopet Municipal Elementary School	75	138
2.	D	Special Municipal Elementary School Sivaraopet.	215	360
3.	A	Municipal Elementary School, Nehrupet.	27	104
4.	A	Raja Rajeswari Municipal Elementary School.	153	380

(Contd..)

			49
5.	B	Special Municipal Elementary School, Balusumudi.	32 232
6.	D	R.C.M. Elementary School, Lankapeta.	48 184
7.	D.	Municipal Elementary School, Peddapeta.	48 57
8.	D	Mantevaripeta Municipal Elementary School.	78 91
9.	C	Municipal Elementary School, Guest House, Road.	112 421
10.	D	7th Ward Municipal Elementary School.	487 305
11.	D	Lal Bahadur Shastri Municipal Elementary School,	247 56
12.	D	6th Ward Special Municipal Elementary School, Church Road.	320 205
13.	D	9th Ward Municipal Elementary School.	180 215
14.	D	Sri Venkateswara Memorial Municipal Elementary School.	234 270
15.	D.	Adivibapiraju Memorial Elementary School.	N.A. 559

16	D	Jyothi Convent School	220	30
17.	C	Municipal Elementary School, S.P. Street	230	382
18.	F	Municipal Upper Primary School	1412	426
19.	F	Municipal Girls School	484	140
20.	F	A.U. School	60	50
21.	F	20th Ward Municipal Elementary School	392	368
22.	F	17th Ward Municipal Elementary School	343	369
23.	F	Bathimpet Elementary School	121	361
24.	E	Narasāiah Agraharam Elementary School.	444	231
25.	E	T.S.S. Special Municipal Elementary School.	3750	215
26.	E	Kurmaiah peta Municipal Elementary School.	690	31
27.	E	Chinarangapalam Municipal Elementary School	168	213
28.	E	St. Mary Convent School (Upper primary)	367	320
29.	E.	T. Lakshmi Narasamba Municipal Elementary School	177	117

(Contd..)

Central Library
 ROORKEE

30.	E	Raghu Gurukulam School	478	51
31.	F	Gunupudi Special Municipal Elementary School	96	22
32.				151

7.6.2.3 HIGH SCHOOLS⁷

There are about 9 High Schools in the town. 1 High school is belongs to Municipality and the other 8 schools are under Private management. The high schools are given in table No.11.

TABLE - 11. THE HIGH SCHOOLS IN THE TOWN.

S.No.	WARD	NAME OF THE HIGH SCHOOL	AREA OF SITE IN SQ.MTS.	NO. OF STUDENTS
1.	A	Jhansi Lakshmi Bai Girls High School	540	142
2.	A	Kasturba High School	9105	95
3.	C	S.C.H. B.R.M. High School	8266	970
4.	C.	Luthern High School	18680	980
5.	D	S.P.G.R. Oriental Sanskrit High School	1194	207

6.	D	S.J.G.M. High School	7830	670
7.	D	Potti Sriramulu Municipal Girls High School	1300	504
8.	F	Batmi Girls & Boys High School	3063	202
9.	E	Rama Krishna Raju High School	335	300

7.6.2.4 GENERAL & TECHNICAL COLLEGES ⁷

There are about 6 Colleges in the Municipal limits of the town and also there is one Engineering College situated in Chinamiram Village which is adjoining to the town. The colleges are given in table No. 12.

TABLE - 12 THE COLLEGES IN THE TOWN.

S.NO.	WARD	NAME OF COLLEGE	AREA OF SITE IN SQ.MTS.	NO. OF STUDENTS.
1.	A	Central Sanskrit College	1115	105
2.	A	Kasturba Junior College	1872	300
3.	A	Rajaram Mohan Roy College	1276	10

(Contd..)

4.	C	D.M.R. College of Arts and Sciences & Post Graduate Centre.	96858	2736
5.	D	Govindarao College of Arts and Sciences	863	32
6.	E	Prakruti Vidya College	200	4
7.		Engineering College situated in Chinamiram village adjoining to the town.		

7.6.2.5 LIBRARIES & READING ROOMS

The number of libraries and reading rooms are about 11, out of which 8 are under Municipal management, 1 library belongs to Dist. Libraries Authority.

7.6.2.6 AUDITORIUMS, THEATRES ETC.

There is an Auditorium in the town. There is Town hall in the town.

7.6.3 MEDICAL FACILITIES.

7.6.3.1 HEALTH CLINICS⁷

There are medical consultancy clinics, Nursing homes, etc.

distributed in the town. The approximate number of health clinics are 50 including nursing homes.

7.6.3.2 HEALTH CENTRES/DISPENSARIES

There are no specific health centres in the town. There are no Govt. Dispensaries in the town.

The Maternity centres like Sesha Rathnamma Maternity and Child Welfare Centre belonging to Municipality, Mary Mosis Bethes Maternity Home belonging to Missionary, etc. are present in the town.

7.6.3.3 HOSPITALS ⁷

There are 3 hospitals in the town ^{such} as Govt. Taluk Head quarters hospital, The Augustan Luthern Mission Hospital. The St, Mary's Hospital. There is one Ramakrishna Nature Cure Hospital and one Govt. Maternary Hospital in the town.

The Govt. Taluk head quarters Hospital has about 16 beds, out of which 8 are maternity beds and the remaining are general beds. The available facilities in this hospital are

1. Out-patient department
 2. Family Planning
 3. Casualty
 4. N.G.O's Clinic
 5. X-Ray department
 6. Maternity ward
 7. T.B Clinic.
- On an average about 250 patients per day are treated in this hospital.

The Augustan Luthern Mission Hospital was started in 1929. This hospital has 65 beds. The available medical facilities in this hospital are 1. General ward 2. Surgical ward 3. T.B. Clinic 4. Family Planning Unit 5. Maternity ward and 6. X-Ray Unit. The site area of this hospital is about 25 acres.

The St. Mary's Hospital was started in 1955 and the site area of this hospital is about one acre. This hospital has 120 beds. The available facilities in this hospital are 1. General Ward 2. Surgical ward 3. Maternity ward 4. X-Ray Unit 5. Leprocy Clinic and 6. Children ward.

The hospitals in the town are given in the table No.13.

TABLE - 13 THE HOSPITALS IN THE TOWN.

56

S.NO.	NAME OF HOSPITAL	AREA OF THE SITE IN ACRES.	NO. OF BEDS.
1.	The Govt. Taluk Head Quarters Hospital		16
2.	Augustan Luthern Mission Hospital	25	65
3.	St.Mary's Hospital	1	120
4.	The Ramakrishna Nature Cure Hospital		
5.	The Govt. Veterinary Hospital		

7.7 OPEN SPACES

7.7.1 PLAY GROUNDS, STADIA, ETC.

There are play grounds in some Schools and Colleges.

7.7.2 PARKS⁷

There are 3 small parks belonging to Municipality. The total area of these parks is about 1700 Sq.metres. The parks in the town are given in Table - 14.

TABLE - 14 PARKS IN THE TOWN.

S.NO.	WARD	NAME OF THE PARK	AREA OF SITE IN SQ.MTS.
1.	A	Sivaraopeta Municipal Park	510
2.	D	Manduri Sesharao Municipal Park	440
3.	D	Alluri Satyanarayana Raju Municipal Park.	750
TOTAL :			1,700

7.7.3 OTHER RECREATIONAL USES

58

There is a recreational club in the town, which is meant only for certain class of society. The area of the club is very less. This is not sufficient to serve the town.

7.7.4 CEMETERIES ETC.

There are some cemeteries/Grave Yards distributed in the town.

7.7.5 NON BUILT UP VACANT LAND

There are small non-built up vacant land sites distributed in the town.

7.8 AGRICULTURAL LAND

7.8.1 LAND UNDER CROPS

There are crop lands around the town, mainly Rice crops.

7.8.2 LAND UNDER WATER

The Water Bodies like Enamaduru drain, G.V. Canal, Annako-deru canal etc. are occupied some land.

The identified existing land uses are organised and prepared land use break-up. The category wise land use areas are adopted from the report on out line development plan of Bheemavaram Town and areas of recent developments are added to those figures and up to date category wise land use break-up is prepared.

The residential land use, is about 942 acres commercial land use is about 102.75 acres. The industrial land use is about 120.3 acres, public and semi public land use is about 111.25 acres, Parks & Play fields land use is about 8.2 acres, Roads & Railways land use is about 500.82 acres and other uses land use is about 318.88 acres. The total land use of developed area is about 2104.20 acres.

The residential land use is about 44.77% the commercial land use is about 4.88%, the industrial land use is about 5.72% Public & Semi public land use is about 5.29% parks & play fields land use is about 0.39%, Roads & Railways land use is about 23.8% and other uses land use is about 15.15%.

The residential area per 1000 population is about 9.24 acres, the commercial area per 1000 population is about 1.01 acres, the industrial area per 1000 population is about 1.18 acres, public & semi public land use per 1000 population is about 1.09 acres, parks & play fields land use per 1000 population is about 0.0008 acres, Roads & Railways land use per 1000 population is about 4.91 acres and other uses land use per 1000 population is about 3.12 acres.

The category wise land uses are given in Table-15.

The existing land use map prepared by Directorate of Town & Country planning is shown in map No. 3.

TABLE - 15 LAND USE OF DIFFERENT CATEGORIES - 1981.

LAND USE CATEGORY	EXISTING LAND USE (ACRES)	PERCENTAGE	AREA PER 1000 POPULATION (ACRES)
RESIDENTIAL	942.0	44.77	9.24
COMMERCIAL	102.75	4.88	1.01
INDUSTRIAL	120.3	5.72	1.18
PUBLIC & SEMI PUBLIC	111.25	5.29	1.09
PARKS & PLAY FIELDS	8.2	0.39	0.0008
ROADS & RAILWAYS	500.82	23.8	4.91
OTHER USES	318.88	15.15	3.12
TOTAL :	2104.20	100	20.55

CHAPTER - 8 FORECASTS FOR THE GENERAL LAND USE PLAN - 2001

8.1 DEMOGRAPHIC PROJECTIONS

8.1.1 POPULATION PROJECTION

According to 1981 census, the population of Bheemavaram Town is 1,01,894. The population projections are made by different methods. As per arithmetic rate of increase the projected population for 2001 is 1,78,158, As per Geometric rate of increase the projected population for 2001 is 2,23,758 as per component method the projected population for 2001 is 2,02,454, as per statistical method the projected population for 2001 is 2,01,350 . Population projections by different methods are given in Table No. 16. Popn. Proj. are in fig. No. 4.

8.1.2 FORECASTS OF FUTURE WORK FORCE

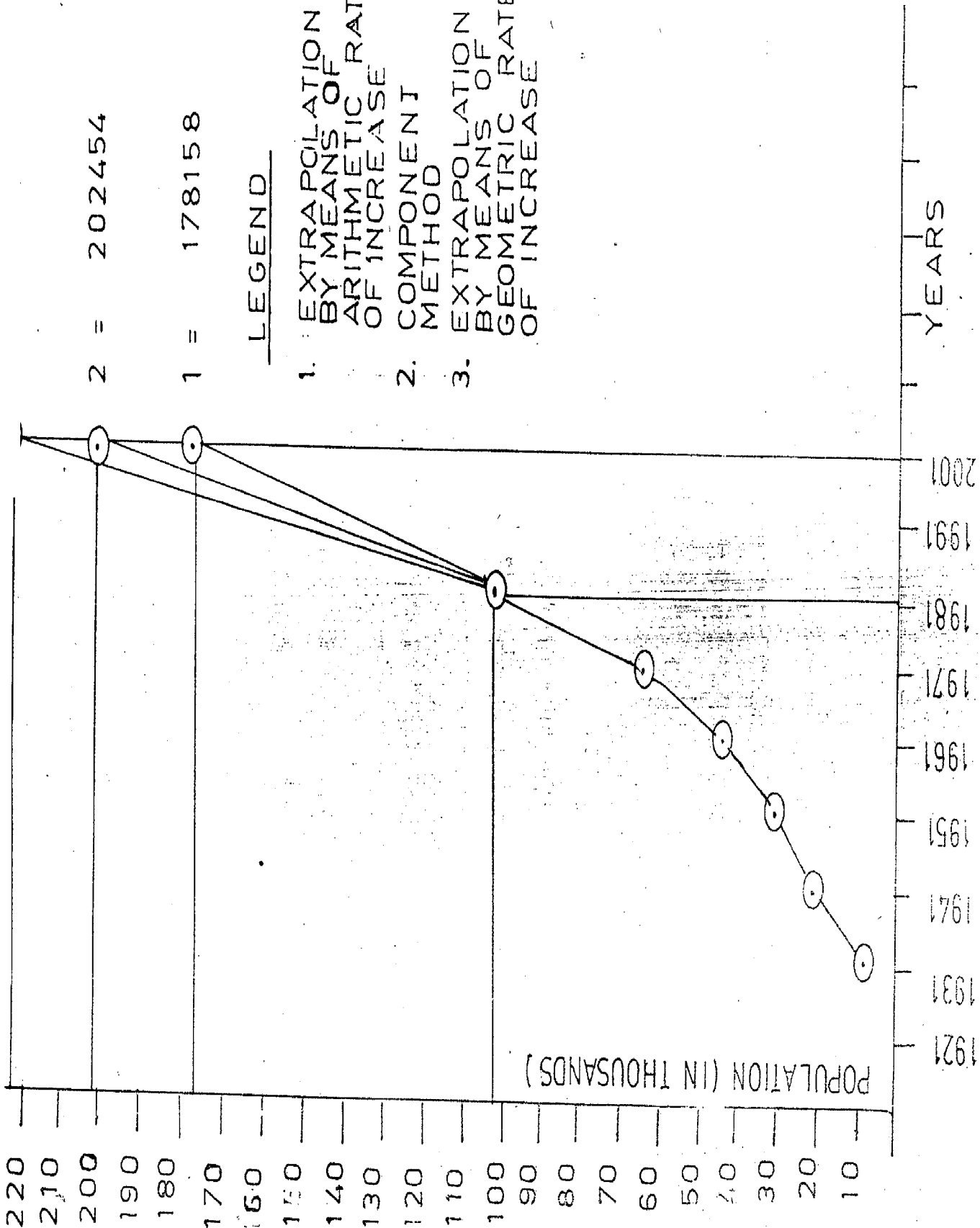
The work force figures from 1961 to 1981 are 16,076, 20,370, 34,308 respectively, which are taken from census reports. The projected figures for 1991 and 2001 are 53,733 and 78,516 respectively. The informal sector work force for 1991 and 2001 are 34,695 and 50,569 respectively, which were estimated as per planning commission estimate of 64.57%^{of} workforce. Forecasts of future work force are shown in Table-17.

TABLE - 16 POPULATION PROJECTION BY DIFFERENT METHODS.

METHOD	POPULATION 1971	POPULATION 1981	PROJECTED POPULATION 1991	POPULATION 2001
. ARITHMETIC RATE OF INCREASE	63,762	1,01,894	1,40,026	1,78,158
. GEOMETRIC RATE OF INCREASE	63,762	1,01,894	1,62,827	2,23,758
. COMPONENT METHOD	63,762	1,01,894	1,52,174	2,02,454
4. STATISTICAL METHOD	63,762	1,01,894	1,51,622	2,01,350

TABLE - 17 FORECASTS OF FUTURE WORK FORCE OF THE TOWN, 1981 - 2001

YEAR	POPULATION	WORK FORCE	% OF WORK FORCE TO TOTAL POPULATION	INFORMAL SECTOR WORK- FORCE @ 64.57% OF WORK FORCE.
1961	43,821	16,076	36.7	
1971	63,762	20,370	31.9	
1981	1,01,894	34,303	33.67	
1991	1,62,827	53,733	33.0	34,695
2001	2,23,759	78,316	35.0	50,569



LEGEND

1. EXTRAPOLATION BY MEANS OF ARITHMETIC RATE OF INCREASE
2. COMPONENT METHOD
3. EXTRAPOLATION BY MEANS OF GEOMETRIC RATE OF INCREASE

FIG. 4. POPULATION PROJECTION FOR 2001

8.2 FORECASTS FOR FUTURE LAND USES VERSUS FACILITIES - 2001

8.2.1 FORECASTS OF FUTURE RESIDENTIAL LANDUSES, 1981 - 2001

The available houses as per 1981 census are 19,513. Total houses required by 2001 @ one house per 5 persons are 44,752. Total residential landuse required by 2001 @ 6.9 acres per thousand population per single storey density⁹ as per committee on planning projects is about 1538.7 acres.

Forecasts for residential landuses for 2001 are given in Table - 18.

8.2.2 FORECASTS FOR COMMERCIAL LANDUSES.

As per COPP⁹, 14 shops per 1000 population for town are required, and these shops are to be distributed in hierarchy of planning unit shopping centres such as neighbour hood shopping centre @ 3.5 shops per 1000 population⁹ which comes to 0.13 acres, Sector centre @ 4.5 shops per 1000 population⁹ which comes to 1.9 acres, community centre @ 3.5 shops per 1000 population⁹ which comes to 4.5 acres, Town centre @ 2.5 shops per 1000 population⁹ which comes to 40 acres approximately. The total retail area is about 0.44 acres per 1000 population⁹. Whole sale area is about 0.078 acres per 1000 population. So total commercial area comes to 0.518 acres per 1000 population. These shopping centres are located

⁹ Committee on Plan Projects, Review of Norms and Standards for Public Sector Towns .

TABLE - 18 FORECASTS OF FUTURE RESIDENTIAL LAND USES, 1981 - 2001

PARTICULARS	YEARS					STANDARDS ⁹
	1961	1971	1981	1991	2001	
1. POPULATION	43821	63762	101894	162827	223759	@ 1 House Per 5 Persons.
2. AVAILABLE HOUSES	6873	11523	19513			
3. ADDE. HOUSES REQUIRED	1891	1229	866			@ 1 House Per 5 Persons.
4. TOTAL HOUSES REQUIRED	8764	12752	20379	32565	44752	
5. TOTAL LAND USE	8764			1124.7	1538.7	@ 6.9 acre/1000 Population for single storey, as per COPP.

as per service radius distances.

Total shops required by 2001 for town are 3136 @ 14 shops per 1000 population. The neighbourhood centres, required for 2001 are 45, the sector centres required for 2001 are 15, the community centres required by 2001 are 5 and 1 town centre is required by 2001. The retail land use required by 2001 is about 17.47 acres. The total commercial land

TABLE - 19 FORECASTS FOR COMMERCIAL LAND USES, 1981 - 2001

PARTICULARS	YEARS			STANDARDS ⁹
	1981	1991	2001	
1. POPULATION	101894	162827	223759	AS PER COPP 14 shops/ 1000 population for town, and these shops are to be distributed in-hierarchy of plann- ing unit shopping centres such as
2. AVAILABLE SHOPS	2300			
3. TOTAL SHOPS REQUIRED	1428	2282	3136	Neighbourhood-3.5-0.13 acres; Sector-4.5 shops- 1.9 acres; community-3.5- 4.5 acres; Town centre 2.5 - 40 acres.
4. PLANNING UNIT SHOP- PING CENTRES				
4.1 NEIGHBOURHOOD CENTRES		33	45	
4.2 SECTOR CENTRES		11	15	
4.3 COMMUNITY CENTRES		4	5	
4.4 TOWN CENTRE		1	1	
5. RETAIL LAND USE REQUIRED		71.72	98.56	The total retail area is 0.44 acres/1000 population.
6. WHOLE SALE & STORAGE LANDUSE REQUIRED		12.72	17.47	The wholesale & Storage area is 0.078 acre/1000 population. i.e.0.518/ 1000 population totally.
7. TOTAL COMMERCIAL LANDUSE REQUIRED		84.44	115.52	

use required by 2001 is 115.52 acres. The forecasts for commercial landuses are given in table - 19.

8.2.3 FORECASTS FOR FUTURE INDUSTRIAL LANDUSES.

In general more industrial land than actually be needed should be reserved with the view of suitability of site and other factors, based on the premise that some vacant land and lots will always be available. In general, the industrial land use varies between 0.6 to 14 acres per 1000 population depending on adjustments in economic base, and other factors. The industrial land use @ 0.6 & 12.5 acres per 1000 population are 141.12 & 2800 acres respectively. The forecasts for industrial uses @ 12.5 acres per 1000 population is adopted for this town with a view of reserving suitable land, which comes to 2800 acres.

8.2.4 PUBLIC & SEMI PUBLIC LAND USE FORECASTS

8.2.4.1 FORECASTS FOR FUTURE CIVIC CENTRES

The Civic facilities should be grouped together and could be distributed in hierarchy of planning units as per needs, or could be located at specific locations. The civic facilities include

TABLE - 20 FORECASTS OF FUTURE HIERARCHY WISE CIVIC CENTRES LAND USES
1981 - 2001, AS PER STANDARDS.

PLANNING UNIT	AREA ADOPTED PER UNIT (IN ACRES)	TOTAL AREA		STANDARDS ⁹	
		1991	2001	COPP	TCPO
1. SECTOR CENTRE	2	22	30	1 to 1.5	1.5 to 2
2. COMMUNITY CENTRE	7	28	35	7	7
3. TOWN CENTRE	0.6/1000 Pop.	97.8	133.8	0.5 to 0.6 per 1000 Population	0.5 to 0.6 per 1000 population
TOTAL :		147.8	198.8		

Govt. administrative buildings and other public service facilities, for example, Municipal Office, Town hall, Community hall, Police Station, Fire Station, Post and Telegraph Offices, Telephone Exchange, Health Centre (Govt), Court, Etc., Libraries, auditorium, Musium, art gallery, and so on. The forecasts of future hierarchy wise civic centres land uses are given here in Table No. 20.

The standards for civic centres area are 1 to 1.5 acres and 1.5 to 2 acres as per COPP and TCPO respectively, out of which 2 acres per sector centre civic area is adopted. Standards for community centre civic area are 7 acres and 7 acres as per COPP and TCPO respectively. Hence 7 acres per community centre civic area is adopted. The standards for town centre civic area are 0.5 to 0.6 acres per 1000 population as per both COPP and TCPO, hence 0.6/1000 population is adopted.

The total area of sector centres civic areas for 2001 is about 30 acres, the total area of community centres civic areas for 2001 is about 35 acres and Town centre civic area is about 133.8 acres. The total area of civic centres land uses of the town for 2001 is about 198.8 acres.

8.2.4.2 FORECASTS FOR FUTURE EDUCATIONAL FACILITIES LAND USES. - 2001

The standards for Nursery school are one Nursery school per 1250 to 1500 population, the service radius is 0.4 Km, the site area is 0.75 acres in which 0.4 acres for school building and 0.35 acres for play field, 75 to 90 seats per school as per TCPO.

TABLE - 21. FORECASTS FOR EDUCATIONAL FACILITIES LAND USES 1981-2001.

EDUCATIONAL FACILITY	EXISTING NO. OF INSTITUTIONS PER ATTENDING STUDENTS	TOTALLY REQUIRED NO. OF INSTITUTIONS PER TOTAL AGE GROUP STUDENTS IN BRACKETS, AND TOTAL LAND USE AS PER STANDARDS.		STANDARDS
		1981	2001	
1. NURSERY SCHOOL		(101/9118)	(139/12530)	0.75 acres Site area as per TCPO. 0.4 for school bldg. + 0.35 play field. 0.4 Km. - Service radius - COPP. 1250 to 1500 - population served - TCPO. 75 to 90 Seats per School - TCPO. 5.6% are 3 to 5 Age group - COPP.
2. PRIMARY SCHOOL	31/7003	(34/20353)	(47/27966)	3 Acres - Site area - COPP. 1 acre for School Bldg. + 2 acres Play field. 0.4 to 0.6 Km - service radius - COPP. 3500 to 5000 population served - TCPO. 600 seats per school - COPP. 12.5% 6 to 10 Age group - COPP.

Conti...

3. HIGHER SECONDARY SCHOOL.	9 H.S. + 1 H.S.S./ 4370	(21/22568)(28/31013) 73.5 + 98 + 73.5 P.F. 98 P.F	6 to 8 acres Site area- COPP. 3.5 School Bldg. + 3.5 Play field. 0.54 to 1.61 Km -Service radius - COPP. 7500 - Population served. 1100 Seats per School-COPP. 13.86% 11 to 18 Age Group - COPP.
4. GENERAL COLLEGE 3/3000		(1) 10 + 5 P.F	One general college and one Technical College for a town of 1/2 to one lakh population as per TCPO.
5. Technical and Vocational Colleges.	ENGG. COL.	(2) 20 + 10 P.F	

		147.9 230.6 + + 176.85 P.F	

		255.65 P.F	

	GRAND TOTAL	326.75 486.25	

The Nursery school age group children of 3 to 5 years are 5.6% as per
COPP.⁹

The standards for primary school are one primary school per 3500
population as per TCPO, the service radius is 0.4 Km. to 0.6 km, the
site area is 3 acres in which 1 acre for school building and 2 acres
for play field, 600 seats per school, the primary school age group
children of 5 to 10 years are 12.5% as per COPP.⁹

3 bbl⁹.

The standards for high school and or higher secondary school are one higher secondary school per 7500 population, the service radius is 0.54 Km to 1.61 Km, the site area is 6 to 8 acres in which 3.5 acres for school building and 3.5 to 4.5 acres for play field, 1100 seats per school, the higher secondary school age group people of 11 to 18 years are 13.86%.

The standards for colleges are one general college, one Technical and vocational college for a town of $\frac{1}{2}$ to 1 lakh population as per TCPO.

The nursery schools required by 2001 are 139 per 12530 children and the land use is about 104.25 acres in which 55.6 acres for buildings and 48.65 acres for play fields. The primary schools required by 2001 are 47 per 27966 children, and the landuse is about 141 acres in which 47 acres are for buildings and 94 acres for play fields.

The higher secondary schools required by 2001 are 29 per 34013 age group people and the landuse is about 196 acres in which 98 acres are for buildings and 98 acres for play fields. One General college for of 15 acres in which 10 acres for buildings and 5 acres for play fields. One III cum Polytechnic college and one Agricultural college are

required for 2001 and the landuses are 45 acres in which 30 acres are for buildings and 15 acres are for play fields. The total area of educational facilities landuses is 486.25 acres in which 230.6 acres for buildings and 255.65 acres for play fields. Refer Table - 21.

8.2.4.3 FORECASTS FOR FUTURE CULTURAL FACILITIES AND RELIGIOUS FACILITIES LAND USES.

The areas of Cultural facilities & Religious facilities are included in the Hierarchy of planning unit Civic centres, hence they are to be added while designing the civic centres, as per needs & standards.

8.2.4.4 FORECASTS FOR FUTURE MEDICAL FACILITIES LAND USES AS PER STANDARDS.

The standards for health clinics are one health clinic per 12000 population and the site area is about 0.5 acres⁹.

The standards for health centres are one health centre per 20000 population and the site area is 1 acre to 1.5 acres as per COFP, one health centre per 36000 population and the site area is 1.5 acres as per TCFU⁹, the health centre contains Emergency unit

as well as 4 to 6 beds⁹.

TABLE - 22. FORECASTS FOR FUTURE MEDICAL FACILITIES LAND USES AS PER STANDARDS, 1981 - 2001.

FACILITY	EXISTING NO. OF FACILITIES PER NO. OF BEDS	TOTAL LAND USE AND NO. OF FACILITIES OR TOTAL NO. OF BEDS IN BRACKETS, AS PER STANDARDS.		STANDARDS
		1991	2001	
1. HEALTH CLINICS	53	7 (14)	9.5 (19)	One health clinic per 12000 population and the site area is 0.5 acres as per TCPO.
2. HEALTH CENTRES	1	12	16.5	1 No. for 20000 population & the site area is 1 to 1.5 acres, As per COPP. 1 unit per 35000 population & the site area is 1.5 acres, as per TCPO. Health centre contains Emergency unit as well as 4 to 6 beds.

(Contd...)

3. HOSPITALS 2/201	25	40	4 beds per 1000 population as per TCPO.
	(652 Beds)	(892 Beds)	25 Bed - 5 Acres @ 720 Sft/bed 50 Bed - 15 @ 660 Sft.per bed. 100 Bed - 15 @ 450 Sft per Bed. 200 Bed - 15 @ 400 Sft. per Bed. 500 to 700 Maximum - 25 acres, as per COPP.
Total :	44	66	

The standards for hospitals are 4 beds per 1000 population as per TCPO; for 25 bed hospital @ 720 Sft per bed, 5 acres are required; for 50 bed hospital @ 660 Sft 15 acres are required; for 100 bed hospital @ 450 Sft 15 acres are required; for 200 bed hospital @ 400 Sft 15 acres are required; for 500 to 700 beds maximum 25 acres are required as per COPP.

The health clinics required by 2001 are 19 and the area is about 9.5 acres. The health centres required by 2001 are 11 and the area is about 16.5 acres. The hospital beds required by 2001 are 892 beds and the area is about 40 acres. The total area of Medical facilities land uses are 66 acres by 2001. Refer Table - 22.

8.2.4.5 FORECASTS FOR FUTURE PARKS & PLAY FIELDS LANDUSES.

The standards for parks & play fields landuses are 4 acres per 1000 population for urban area, which should be distributed in various levels of planning units as per COPP.⁹

In neighbour hood level 1 acre per 1000 population should be distributed.⁹ In sector level 1 acre per 1000 population should be distributed as per COPP.⁹ In community level of 45,000 population 0.75 acres per 1000 population should be distributed as per COPP.⁹ In town level 1.25 acres per 1000 population should be distributed as per COPP.⁹

The parks & play fields landuses in neighbour hood level, sector level, community level & town level are 225 acres per 45 centres, 225 acres per 15 centres, 169 acres per 5 centres, 280 acres per 1 unit of town respectively. The total area of parks & play fields for the town by 2001 is 899 acres.

The forecasts for future parks & play fields landuses are given in Table - 25.

⁹ ibid.

TABLE - 23. FORECASTS FOR FUTURE PARKS AND PLAYFIELDS LAND USES
AS PER STANDARDS, 1981 - 2001.

LEVEL OF PLANNING UNIT	EXISTING FACILITIES 1981	TOTAL LAND USE AND TOTAL PLANNING UNITS IN BRACKETS		9 STANDARDS
		1991	2001	
1. NEIGHBOURHOOD		(33) 165	(45) 225	1 acre per 1000 population in Neighbourhood level, as per COPP.
2. SECTOR LEVEL		(11) 165	(15) 225	1 acre per 1000 population in sector level, as per COPP.
3. COMMUNITY		(4) 135	(5) 169	0.75 acre per 1000 population in community level of 45,000 population, as per COPP.
4. TOWN LEVEL		(1) 203	(1) 280	1.25 acre per 1000 population in Town level, as per COPP.
TOTAL :	8.2	668	899	4 acres per 1000 population.

8.3 SUMMARY OF FORECASTS OF LAND USES

The standards for residential landuses are 6.9 acres per 1000 population per single storey density at cluster level as per copp.

The standards for commercial landuses are 0.44 acres per 1000 population for retail and 0.078 acres per 1000 population for whole sale and ware housing, i.e. total of 0.518 acres per 1000 population as per COPP.

The standards for industrial landuses are 0.345 acres per 1000 population for essential service & small scale industries and other industrial landuse should be added to this depending on various factors such as economic base, availability of raw materials etc. but industrial area of 12.5 acres per 1000 population is adopted for this town with the view of reserving suitable land.

The standards for Public & Semi public landuses are 2.415 acres per 1000 population excluding play fields of educational facilities, since they are included in parks & play fields land use category.

The standards for parks & play fields landuses are 4 acres

per 1000 population which should be distributed in various levels of planning units.

TABLE - 24. FORECASTS FOR LAND USES OF DIFFERENT CATEGORIES AS PER STANDARDS 1981 - 2001

LANDUSE CATEGORIES	TOTAL LAND USE		AREA PER 1000 POPN.	STANDARDS AND REMARKS
	1991	2001		
1. RESIDENTIAL	1124.7	1538.7	6.9	@ 6.9/1000 Popn. for single storey, as per COPP.
2. COMMERCIAL	84.44	115.52	0.518	@ 0.44/1000 Popn. for retail + @ 0.078/1000 Popn. for whole sale and warehousing i.e. 0.518/1000 popn. as per COPP.
3. INDUSTRIAL	2037.5	2800	12.5	As per COPP, 0.345/1000 Popn. for essential service & small scale industries, other ind. land use adds depending on various factors. But 12.5 acres/1000 popn. which is adopted in New ind. towns is adopted here with the view of reserving suitable land.
(Essential service & Small Scale Industries)	(56.24)	(76.94)	(0.345)	
4. PUBLIC & SEMI PUBLIC	393.55	540.96	2.415	As per COPP, 2.415/1000 Popn. excluding play fields of educational facilities, since

They are included in parks & play fields land use category.

5. PARKS & PLAY FIELDS	652	892	4	As per, COPP, 4 acres/1000 popn. which should be distributed in various levels of planning units.
6. ROADS	618.59	850.08	3.795	As per COPP, 3.795 acres per 1000 popn. other transport land uses adds to this depending on other factors.
7. OTHER USES				Other uses are to be computed at last stages, as they depend on topography and other factors.

TOTAL 4910.88 6737.26 30.128

The standards for Roads land uses are 3.795 acres per 1000 population other transportation land uses should be added depending on other factors.

The residential area required by 2001 is about 1538.7 acres which comes to 6.9 acres per 1000 population. The commercial area required by 2001 is 115.52 acres which comes to 0.518 acres per 1000 population. The industrial area required by 2001 is about 2800 acres which is 12.5 acres per 1000 population. The area of public & semi public land uses required by 2001 is about 540.96

acres which is 2.415 acres per 1000 population. The parks & play fields land uses required by 2001 is about 892 acres which is 4 acres per 1000 population. The area of roads required by 2001 is about 850.08 acres, which is 3.795 acres per 1000 population. The area of other uses are not added here as it is variable as per topography.

The total area of various landuses required by 2001 is 6737.26 acres which is 30.128 acres per 1000 population. Refer Table-24.

8.4 THE ADOPTED FACILITIES FOR CALCULATING LANDUSES FOR THE GENERAL LANDUSE PLAN - 2001.

The adopted facilities for the general landuse plan - 2001 are neighbour hood shopping cum civic centres 13 Nos., Sector centres 6 Nos., Community Centres 5 Nos., Town shopping centres 1 No., Town Civic centre 1 No.; Regarding Educational facilities, Nursery schools, 22 Nos., Primary schools 22 Nos., Higher secondary schools 8 Nos., General and Technical Colleges such as ITI cum Polytechnic College, Agricultural college etc., 4 Nos., regarding Medical facilities Health centres 6 Nos., Community General Hospitals 2 Nos.; Regarding parks & play fields, cluster parks 15 Nos., Neighbourhood/sector park

15 Nos., Community parks 5 Nos., Tot lots of Nursery schools 22 Nos., play fields of primary schools 22 nos., play fields of Higher Secondary schools 8 Nos., Play fields of General and Technical Colleges 4 Nos. Neighbour Hood/Sector playfields for Adults 5 Nos.; Solid waste disposal sites 2 Nos., as in Table - 25.

The adopted facilities are formulated on the basis of service radius of different facilities and population requirements. By considering adopted facilities, the areas of land uses of different categories should be computed. By considering adopted facilities, of land use plan on the basis of service radius of different facilities and population requirements. The required number of sites and totally required area for poor migrants; temporary accommodation cum flood shelters are to be calculated @ one site of about 15 acres per sector area of about 250 acres. Since the Directorate of town & country Plng. has already prepared layout for outline development plan for 1991, so it is thought reparation of layout plan is unnecessary, and so the sites for poor migrants temporary accommodation

TABLE - 25. THE ADOPTED FACILITIES FOR CALCULATING THE LANDUSES OF DIFFERENT CATEGORIES FOR GENERAL LANDUSE PLAN - 2001.

S.No.	Facility	Number of facilities required as per standards, 2001	Number of adopted facilities for landuse plan - 2001.
1.	Shopping cum civic centres		
1.1	Neighbour hood (Shopping cum civic) centres	45	13
1.2	Sector centres	15	6
1.3	Community centres	5	5
1.4.1	Town shopping centre	1	1
1.4.2	Town civic centre	1	1
2.	Educational facilities		
2.1	Nursery schools	135	22
2.2	Primary schools	45	22
2.3	Higher Secondary schools	30	8
2.4	General & Technical Colleges	4	4
3.	Medical facilities		
3.1	Health centres	15	6

S.No.	Facility	Number of facilities required as per standards-2001.	Number of adopted facilities for landuse plan -2001.
3.2	Community General Hospitals	2	2
4	Parks & play fields		
4.1.1	Cluster parks	135	15
4.1.2	Neighbourhood/ Sector park	15	15
4.1.3	Community park	5	5
4.2.1	Tot lots of nursery schools	135	22
4.2.2	Play fields of Primary schools	45	22
4.2.3	Playfields of Higher Secondary schools	30	8
4.2.4	Play fields of General & Technical Colleges	4	4
4.2.5	Neighbour hood/ sector play fields for Adults	15	5
5.1	Solidwaste disposal sites		2

cum flood shelters could be located within the frame work of outline development plan prepared by Directorate of town & country planning.

8.5 THE ADOPTED AREAS OF DIFFERENT CATEGORIES OF LANDUSES FOR THE GENERAL LANDUSE PLAN-2001.

The Category wise adopted landuse areas for the general landuse plan 2001 are - residential area is 1621 acres which is 30.05% of development area and 7.24 acres per 1000 population, commercial area is 250.72 acres which is 34.65% of development area and 1.12 acres per 1000 population, the industrial area is 988.3 acres which is 18.32% and 4.41 acres per 1000 population, the public & Semi public landuses are 553.85 acres which is 10.26% of development area and 2.47 acres per 1000 population, parks & play fields landuses are 429.9 acres which is 7.96% of development area and 1.92 acres per 1000 population, the area of roads is 959.62 acres which is 17.78% of development area and 4.28 acres per 1000 population and area of other uses is 592.67 acres which is 10.98% of development area and 2.64 acres per 1000 population.

The total area of all categories of urban landuses is 5395.78 acres which is 24.06 acres per 1000 population. Refer Table - 26.

TABLE - 26 ADOPTED LAND USES OF DIFFERENT CATEGORIES FOR THE GENERAL
LAND USE PLAN - 2001

LAND USE CATEGORY	EXISTING LAND USE - 1991			THE GENERAL LAND USE PLAN 2001		
	AREA IN ACRES	% OF DEVE- LOPED AREA	AREA PER 1000 POPN.	AREA IN ACRES	% OF DEVE- LOPMENT AREA	AREA PER 1000 POPN.
1. RESIDENTIAL	942	44.77	9.24	1621	30.05	7.24
2. COMMERCIAL	102.75	4.88	1.01	250.72	4.65	1.12
3. INDUSTRIAL	120.3	5.72	1.18	988.3	18.32	4.41
4. PUBLIC & SEMI PUBLIC	111.25	5.29	1.09	553.85	10.26	2.47
5. PARKS & PLAY FIELDS	8.2	0.39	0.0008	429.6	7.96	1.92
6. ROADS	500.82	23.8	4.91	959.62	17.78	4.28
7. OTHER USES	318.88	15.15	3.12	592.67	10.98	2.64
TOTAL:	2104.2	100	20.55	5395.78	100	24.08

The total area of all categories of urban land uses except the organised Industrial estate area is 4407.48 acres which should be divided by sector area of 250 acres required for 15,000 population along with community facilities, So as to get number of sites required for poor migrants

temporary accommodation cum flood shelters.

The adopted landuses of different categories for the General landuse
plan - 2001 are shown in table - 26

CHAPTER - 9 PROVISION OF SITES FOR FLOOD SHELTERS CUM POOR
MIGRANTS TEMPORARY ACCOMMODATION.

9.1 THE NEED FOR PROVISION OF SITES FOR FLOOD SHELTERS CUM POOR
MIGRANTS, TEMPORARY ACCOMMODATION.

The town has been affected by flood water due to heavy rains in the town and in its environs and also along Godavari river. The town and its environs are low lying areas, hence Godavari water enters into these areas. The people have been migrating to the town, mainly from surrounding rural areas. The migrants try to occupy Govt. and or private lands. The slums are increasing in number in the town. Even some of the wage earners spent the night on pavements. Their plight is deplorable particularly in times of inclement weather. They perform some essentially required functions. The people staying along Enamaduru drain in squatters, slums and on pavements get badly affected. Many people become shelterless, and their house hold belongings are dumped in water. Hence there is need to save these people from these natural calamities and it is not fair to leave these people to their fate in these civilised days. Hence there is need to provide sites for flood shelters cum poor migrants temporary

accommodation so as to provide social security measures.

9.2 THE CRITERIA FOR LOCATION OF SITES.

The areas of landuses of different categories should be computed by formulating the needed facilities on the basis of service radius of different facilities and population requirements. Since the Directorate of Town & Country planning has already prepared out line development plan for 1991, so that it is thought/repreparation of layout plan is unnecessary and so the sites for poor migrants temporary accommodation cum flood shelters should be located within the frame work of out line development plan prepared by Directorate of Town & country planning.

The total area of all categories of urban landuses except the organised industrial estates should be computed, and then it should be devided by sector area of 250 acres needed for 15,000 population for the density of 60 persons per acre along with community facilities so as to get the number of sites required. Each site should contain about 15 acres to serve the population and to provide temporary accommodation for about

2,000 population per sector area @ 7.5 acres per 1,000 population for single storey density i.e. 60 persons per area.

The total area of all categories of urban land uses is 5395.78 acres which is 24.08 acres per 1000 population.

The total area of all categories of urban land uses except the organised industrial estates area is 4407.48 acres, which is divided by sector area of 250 acres needed for 15,000 population for the density of 60 persons per acre, so we get about 18 sites and each is about 15 acres of land per sector which should be located at suitable places to provide temporary accommodation for about 2000 people per sector @ 7.5 acres per 1000 population for single storey density i.e. 60 persons per acre. These sites should serve for flood shelters and poor migrants temporary accommodation.

9.3 LOCATION OF SITES OF FLOOD SHELTERS

As per the standards & computation, we got 19 sites for flood shelters and poor migrants temporary accommodation out of which 12 sites are located at various locations within the frame work of outline development plan for Bheemavaram town which was prepared by Directorate of town & country planning, and the remaining 6 sites are located to be

While preparing layouts for extending urban areas and in central places of old urban areas as urban renewal projects in future to fulfil the condition of providing one site of about 15 acres per sector area i.e.,

The facilities which would be provided in these sites are family quarters of different types, rooms and halls so as to provide shelter for families, men, women, boys and girls respectively. Night shelters with storage facilities for personal belongings and public conveniences are to be provided in these sites. Mass public shelter facilities and mass storage facilities for their household things should be provided in these sites at higher level in framed structures so as to serve flood victims. These buildings of temporary accommodation & flood shelters should be made strong enough to add additional floors in future. Some space should be left in each site to put up temporary huts when needed. Hence the facilities to be provided in each site are family quarters of different types, rooms and halls so as to provide shelters for families, men, women, boys and girls respectively; night shelters with storage facilities for their personal belongings; public conveniences; mass public shelter facilities and mass storage facilities for their household things so as to serve flood victims; some space to put up temporary huts and so on.

These sites are to be developed and managed under the ownership of town planning section of Municipality. The location and form of sites may be changed as per the design of lay outs, but the condition of one site of about 15 acres per sector area of about 250 acres should remain the same.

The location of sites for flood shelters cum poor migrants temporary accommodation are shown in map No: 4. The areas of the sites of flood shelters cum poor migrants temporary accommodation are given in table No. 27.

The areas of sites of flood shelters cum poor migrants temporary accommodation located within the frame work of out line development plan of Bheemavaram Town are site No.1 - 14.23 acres, Site No.2 - 11.07 acres, Site No.3 - 18.98 acres, Site No. 4 - 25.3, acres, Site No.5 - 18.98 acres, Site No.6 - 16.6 acres, Site No.7 - 18.98 acres, Site No.8 - 18.98 acres, Site No.9 - 15.42 acres, Site No.10 - 26.88 acres, Site No.11- 14.44 acres, and site No. 12 - 11.86 acres.

The areas of sites located within the frame work of outline

OUTLINE DEVELOPMENT PLAN BHIMAVARAM GENERAL TOWN PLANNING SCHEME PROPOSED LAND USE MAP

SCALE 1:10000



WORKS OF THE TOWN PLANNING AUTHORITY
BIMAVARAM
GENERAL TOWN PLANNING SCHEME
PROPOSED LAND USE MAP
SCALE 1:10000
WORKS OF THE TOWN PLANNING AUTHORITY
BIMAVARAM
GENERAL TOWN PLANNING SCHEME
PROPOSED LAND USE MAP
SCALE 1:10000

TABLE - 27 THE SITES AND AREAS OF FLOOD SHELTERS CUM POOR MIGRANTS
TEMPORARY ACCOMMODATION

Site Number	Approximate Area	
	Sq. Meters	Acres
1.	57,600	14.23
2.	44,800	11.07
3.	76,800	18.98
4.	1,02,400	25.3
5.	76,800	18.98
6.	67,200	16.6
7.	76,800	18.98
8.	76,800	18.98
9.	62,400	15.42
10.	1,08,800	26.88
11.	58,432	14.44
12.	48,000	11.86
TOTAL :	8,52,632	211.72

development plan of the Bheemavaram Town varied depending on availability of land, service area and population to be served.

CHAPTER - 10 CONCLUSIONS AND RECOMMENDATIONS:

10.1 CONCLUSIONS

The forecasts are made for facilities and land uses of different categories. The adopted facilities are formulated on the basis of service radius of different facilities and population requirements. The areas of land uses of different categories are computed by considering adopted facilities and the total area of all categories of land uses is 5395.78 acres. The area of all categories of land uses except the area of organised industrial estates is 4407.48 acres, which is divided by sector area of 250 acres required for 15,000 population along with community facilities, and got 18 sites, and each site is about 15 acres of land needed for 2000 population @ 7.5 acres per 1000 population. Since the Directorate of Town & Country planning has already prepared layout for out line development plan for 1991, so it is thought re-preparation of layout is unnecessary. About 12 sites are located within the framework of out line development plan prepared by Directorate of town & country planning, and the remaining 6 sites are located while preparing layouts for extending urban area, and also in central places of old urban areas as urban renewal projects.

in future to fulfil the condition of providing one site of about 15 acres per sector area of 250 acres, ^{including} community facilities.

The areas of the sites of flood shelters cum poor migrants temporary accommodation located within the frame work of out line development plan of Bheemavaram Town are; site No.1 - 14.23 acres, Site No.2 - 11.07 acres, Site No.3 - 18.98 acres, Site No.4 - 25.3, acres, Site No.5 - 18.98 acres, Site No.6 - 16.6 acres, Site No. 7 - 18.98 acres, Site No.8 - 18.98 acres, Site No.9 - 15.42 acres, Site No.10 - 26.88 acres, Site No.11 - 14.44 acres, and Site No. 12 - 11.86 acres.

The areas of sites located within the frame work of outline development plan of the Bheemavaram Town varied depending on availability of land, service area and population to be served.

The facilities which would be provided in these sites are family quarters of different types, rooms and halls so as to provide shelter for families, men, women, boys and girls respectively, and Night shelters with storage facilities for personal belongings and public conveniences are to be provided in these sites, and also

mass public shelter facilities and mass storage facilities for their house hold things should be provided in these sites at higher level in framed structures so as to serve flood victims. These buildings of temporary accommodation & flood shelters should be made strong enough to add additional floors in future. Some space should be reserved in each site to put up temporary huts, so as to use when needed.

These sites should be developed, and the buildings are to be constructed and maintained under the ownership of town planning section of Municipality. The general location and form of sites may be changed as per the design of layouts, but the condition of one site of about 15 acres per sector area of about 250 acres should remain same.

RECOMMENDATIONS :

1. The outline development plan for Bheemavaram town - 1991 prepared by Directorate of town & country planning should be reviewed and revised as per present situation. The spreading of urban area should be restricted strictly and also villages and other growth centres should be developed.

2. The town planning schemes should be subjected to public participation programmes so as to make the people aware of town planning schemes and to invite public opinions, and they are to be analysed and changes may be done in the town planning schemes if needed.
3. The town development area should be sub-divided as per standard Land sub-division regulations. It is found that most of the buildings are single storeyed, and there are many dilapidated and semidilapidated buildings in the town, so urban renewal programmes should be prepared. The sites for community facilities should be acquired and or reserved so as to develop in future as per timely needs.
4. As far as possible, the increasing population should be accommodated by urban renewal projects, and provisions are to be made for vertical extension in future. Some percentage of substandard housing units and or blighted area should be taken up annually to be replaced by Multistoreyed apartment buildings, and provisions are to be made for vertical extension in future, and more percentage of houses should be given for Govt. Employees, Industrial workers and so on. Govt. should take up public housing projects for

orderly growth, of the right amount, in the right place and at the right time; and provisions are to be made for vertical extension in future.

5. All the necessary measures are to be taken to check population migration. Adequate community facilities and employment facilities are to be provided in regional growth centres and or at central places of groups of villages as per needs of population, of the right amount, in the right place and at the right time; and also provisions are to be made for vertical extension in future.
6. The sites of night shelters for unorganised or informal sector work force and floating population should be developed and reserved at the right place. Adequate sites should be reserved at Agricultural market yard & F.C.I. storages for rural visitors who visit for marketing their agricultural produce. In general night shelters are to be located and developed at shopping centres, Rly stations, bus terminus, wholesale markets, industrial areas, and so on; and public toilet facilities are to be added to them. Adequate training institutions are to be located and developed at appropriate places and training should be given to informal sector work force. Adequate areas are to be reserved for petty sellers at off street places

- rather than on roads and streets.
7. Shopping cum civic centres are to be reserved and developed as per timely needs, and provisions are to be made for vertical extension in future.
 8. Some areas for essential service industries are included in various tiers of shopping centres, so the existing service industries should be shifted to these industrial areas; and also the other nuisance industries located in residential areas etc. are to be shifted to specific industrial areas.
 9. The sites for public & semi public uses should be reserved and should be developed as per timely needs, and provisions are to be made for vertical extension in future for population increase and density.
 10. The present per capita water supply should be increased as per standard per capita water supply requirements. The measures are to be taken to increase power supply. The drainage facilities should be improved to accommodate discharges - present and future. Solid wastes disposal sites should be reserved and developed as per timely needs.

11. The sites for parks & play fields should be reserved and developed as per timely needs. Parks should be well designed and landscaped, and suitable species of trees are to be selected and planted in parks and other green belts. The margins of Enamaduru drain, G.V. Canal, etc. should be well landscaped and should be planted with suitable plants.

12. The roads are to be well located and designed as per standards.

The right of way widths should be reserved as per standards.

The encroachments should not be permitted. Adequate parking facilities should be provided in sites etc. as per parking standards.

13. The sites for other landuses should be reserved and developed.

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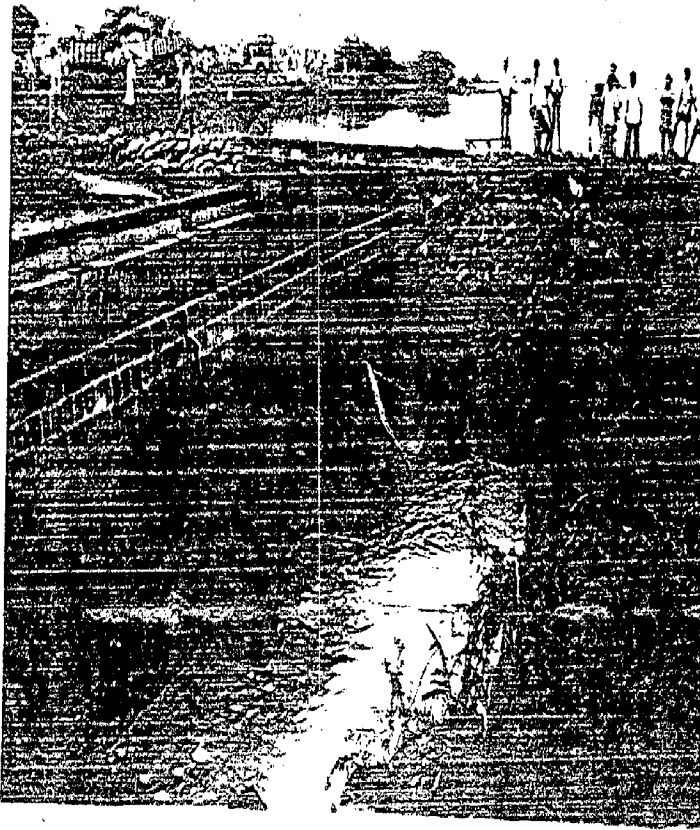
APPENDIX A

SUPPORTIVE CUM INFORMATIVE PHOTOGRAPHS RELATING TO FLOODS IN WEST GODAVARI DISTRICT

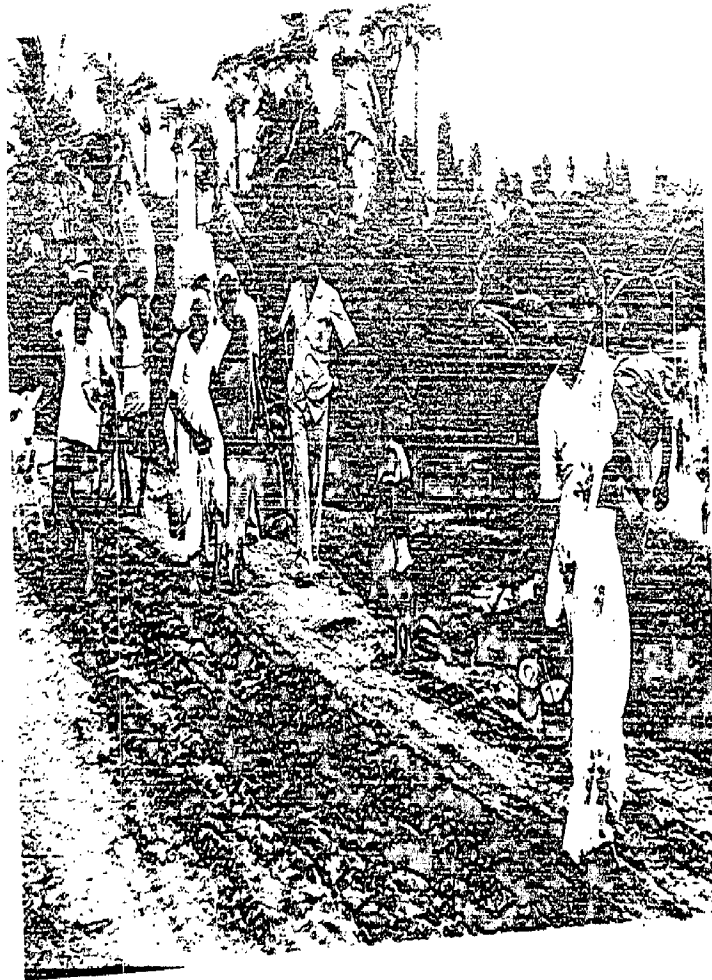
LIST OF PHOTOGRAPHS

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The people were moving to safe places and there was flood water on both sides of the Road as well as on the road to some extent at some places of road.	11
trucks were also used for moving to safe places, and there was water in the fields.	11
people were using trucks for moving to safe places, and there flood water in the fields	11

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10. There was flood water in the urban area of the district 11
11. A Village and the surrounding fields were submerged in flood water
12. A Village and its environs were submerged in flood water
13. A Village and its surrounding areas were dumped in flood water
14. Medical Camp at Gowri Patnam of Devarapalli Mandal of the District
15. About 5,000 people who affected by flood water were sheltered at
a Junior College in Nidadavole.



PHOTOGRAPH - 1. DAMAGED AT LOCK CHAMBER WHICH IS LOCATED NEAR
VIJESWARAM VILLAGE , THE PEOPLE WERE FILLING
THE DAMAGE.



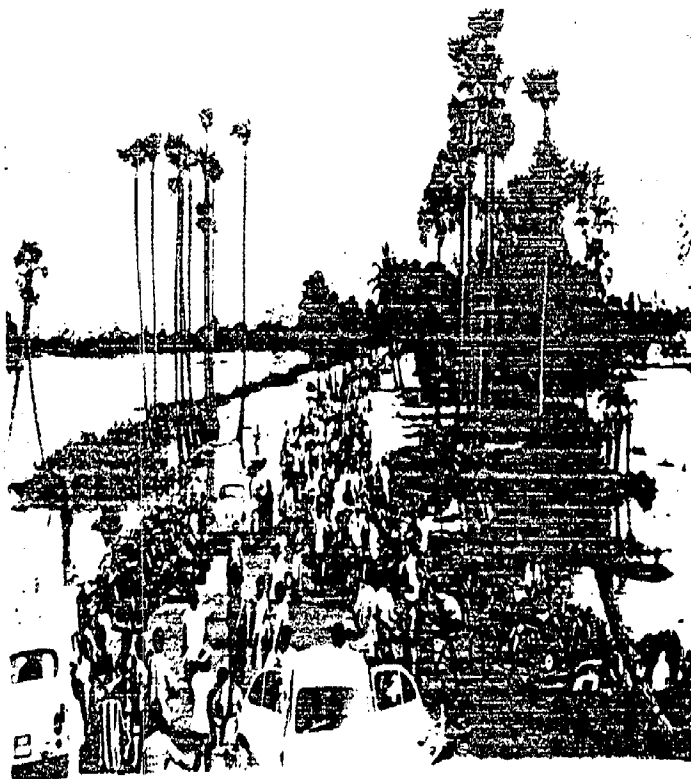
PHOTOGRAPH - 2. THE VLUJESWARAK VILLAGE PEOPLE WITH THEIR SUGGAGE WERE
MOVING TO SAFE PLACES.



PHOTOGRAPH - 8. THE PEOPLE WERE VACATING THE VIJESWARAN VILLAGE LOCATED
NEAR RIVER BOND.



PHOTOGRAPH - 4. THE PEOPLE WERE STAYING ON RIVER BANK IN THE HINTERLAND
OF THE TOWN.



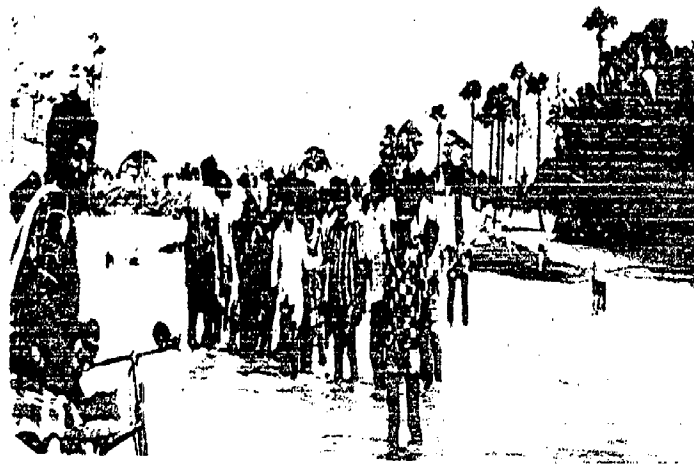
PHOTOGRAPH - 5. THE PEOPLE WERE MOVING TO SAFE PLACES AND THERE WAS FLOOD WATER ON BOTH SIDES OF THE ROAD AS WELL AS ON THE ROAD TO SOME EXTENT AT SOME PLACES OF THE ROAD.



PHOTOGRAPH - 6. THE TRUCKS WERE ALSO USED FOR MOVING TO SAFE PLACES,
AND THERE WAS FLOOD WATER IN THE FIELDS.



PHOTOGRAPH - 7. SOME PEOPLE WERE USING TRUCKS FOR MOVING TO SAFE
PLACES, AND THERE WAS FLOOD WATER IN THE FIELDS.



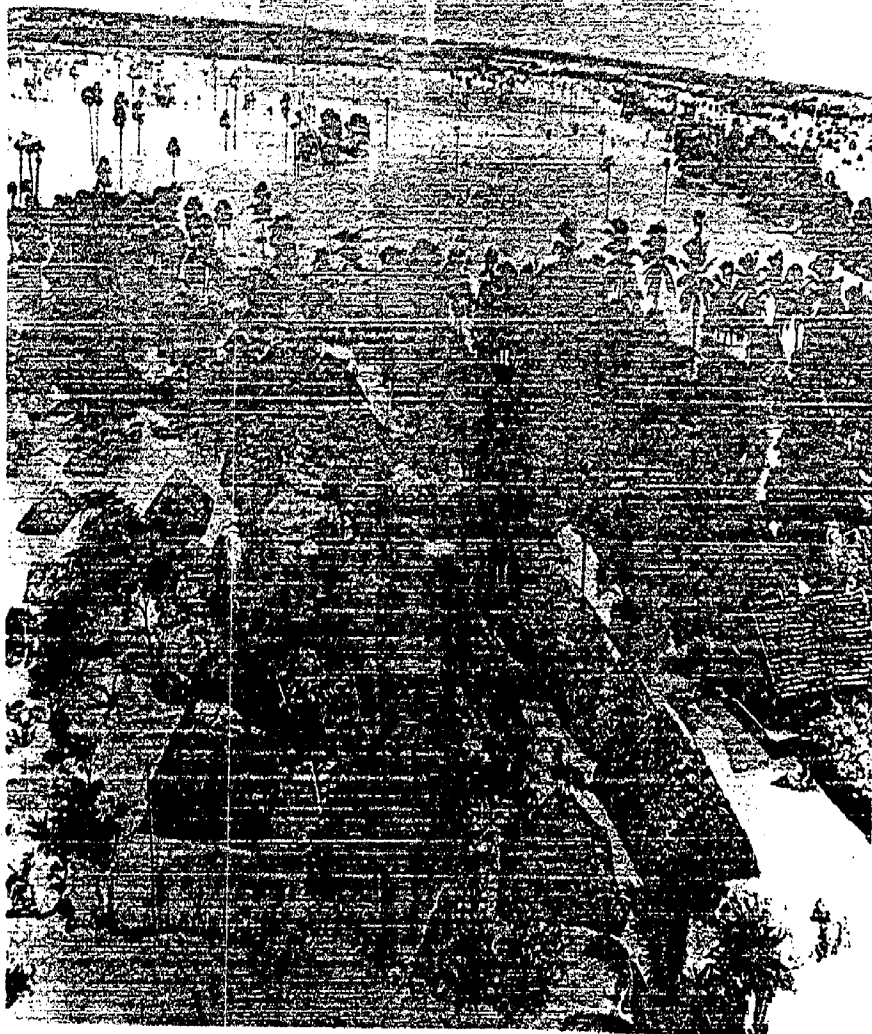
PHOTOGRAPH - 3. THE FIELDS WERE DUNKED AND THE PEOPLE WERE WADING IN
THE FLOOD WATER TO REACH SOME PLACES.



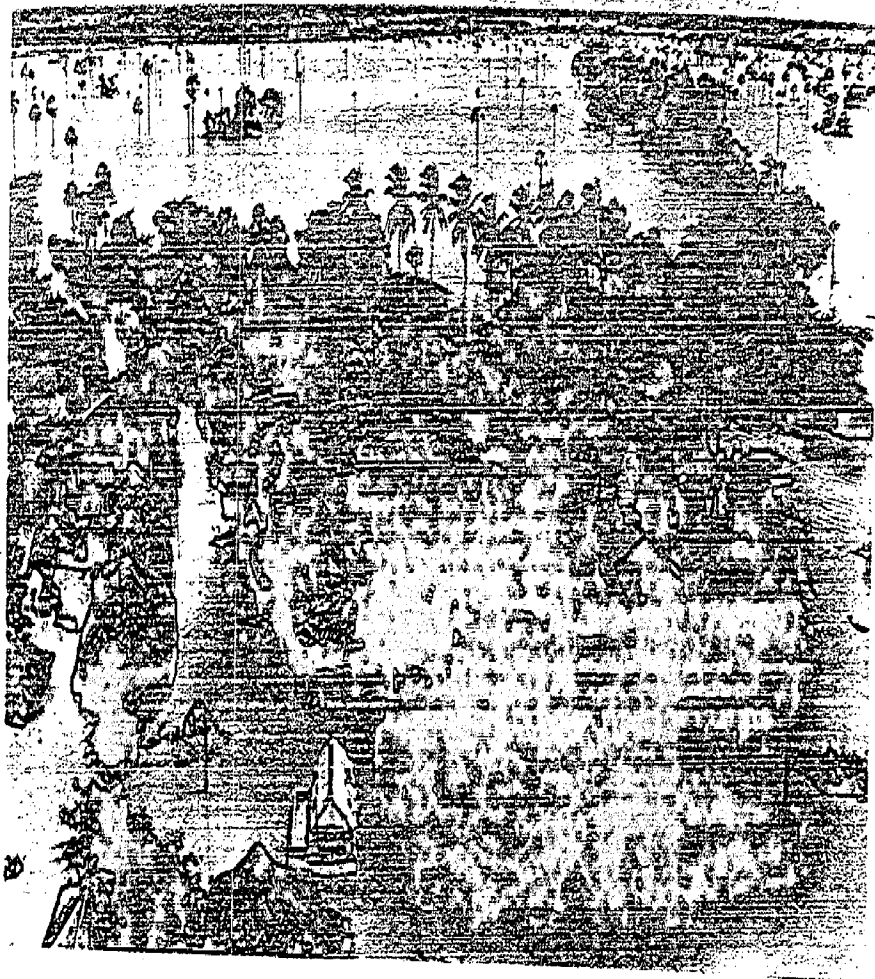
PHOTOGRAPH - 9. THE URBAN AREA IN THE DISTRICT WAS SUBMERGED IN
FLOOD WATER.



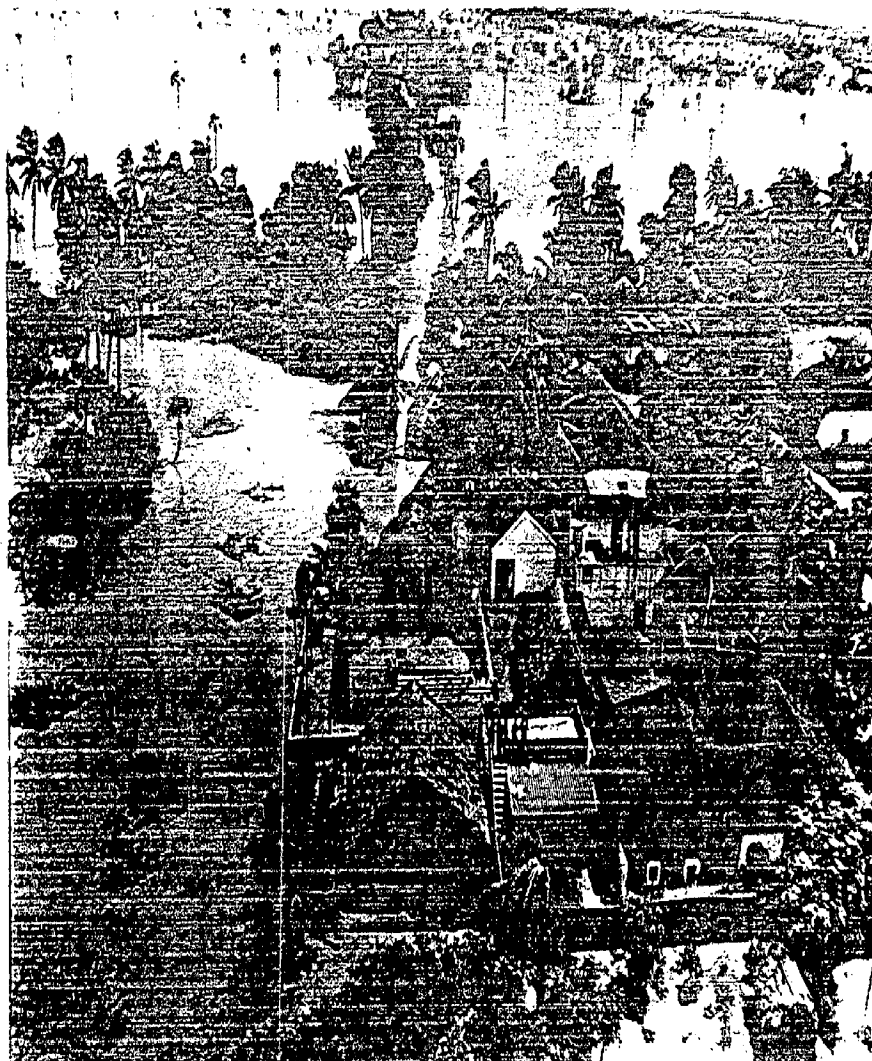
PHOTOGRAPH - 10. THERE WAS FLOOD WATER IN THE URBAN AREA OF THE
DISTRICT.



PHOTOGRAPH - 11. A VILLAGE AND THE SURROUNDING FIELDS WERE SUBMERGED
IN FLOOD WATER.



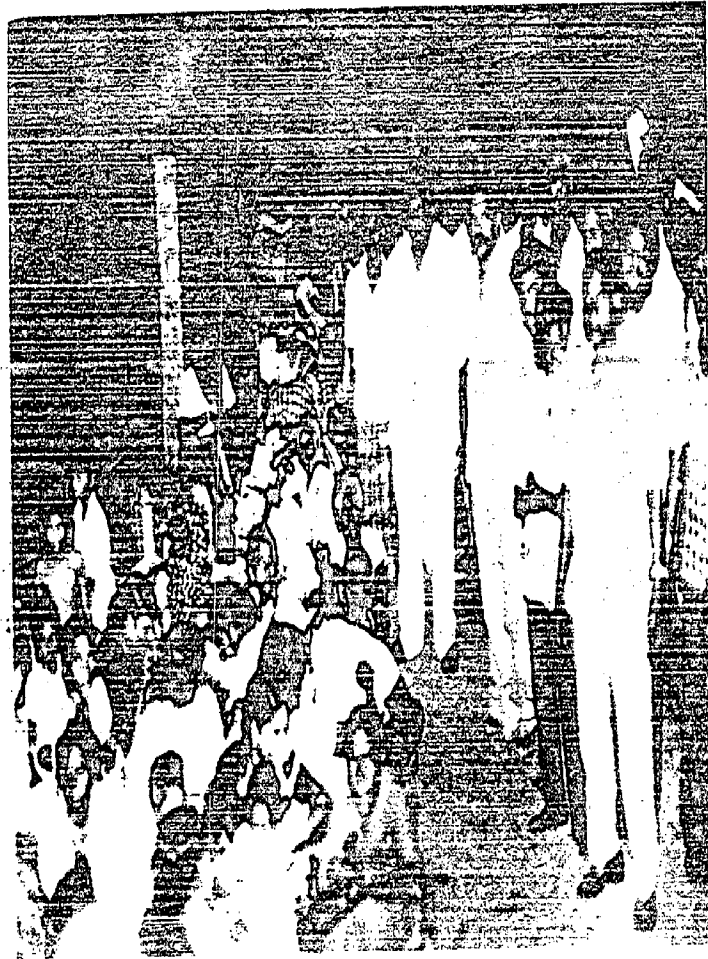
PHOTOGRAPH - 12. A VILLAGE AND ITS ENVIRONS ARE SUBMERGED IN FLOOD
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PHOTOGRAPH - 13. A VILLAGE AND ITS SURROUNDING AREAS WERE DUNKED
IN FLOOD WATER.



PHOTOGRAPH - 14. MEDICAL CAMP AT GOURI PETHAN OF DEWASA PALLI MANDAL
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PHOTOGRAPH - 16. ABOUT 5,000 PEOPLE WHO AFFECTED BY FLOOD WATER

AND SHELTERED AT JUNIOR COLLEGE IN MINDANAO.

APPENDIX B

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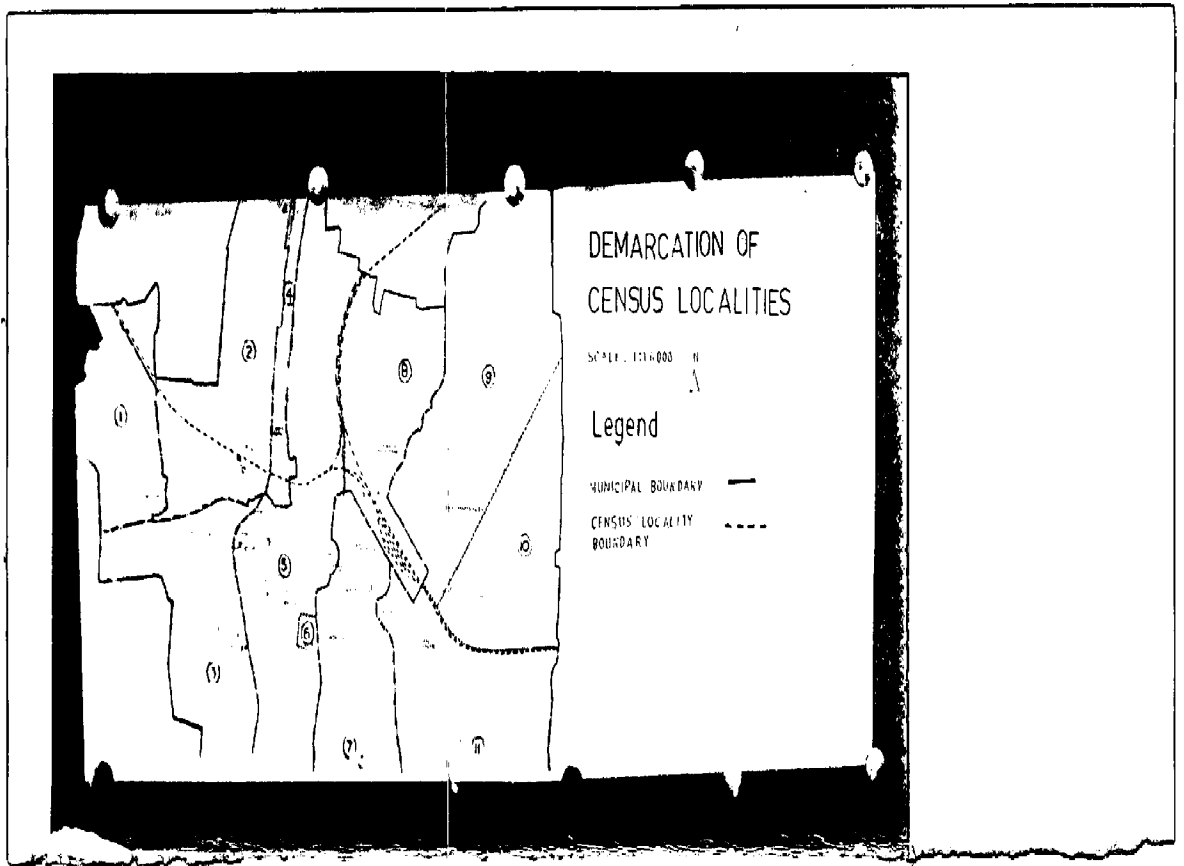
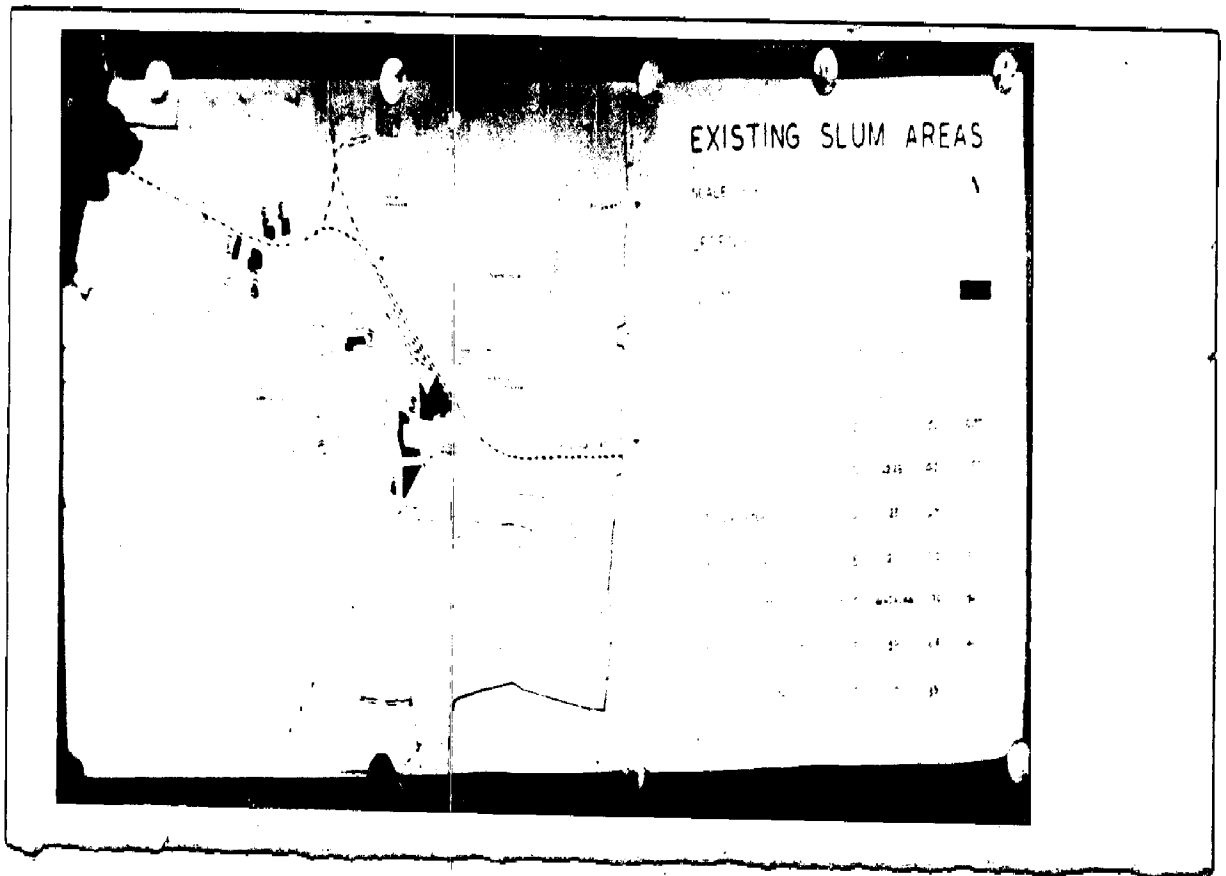


PHOTO. MAP I. DEMARICATION OF CENSUS LOCALITIES



PHOTO, MAP 2. EXISTING SLUM AREAS

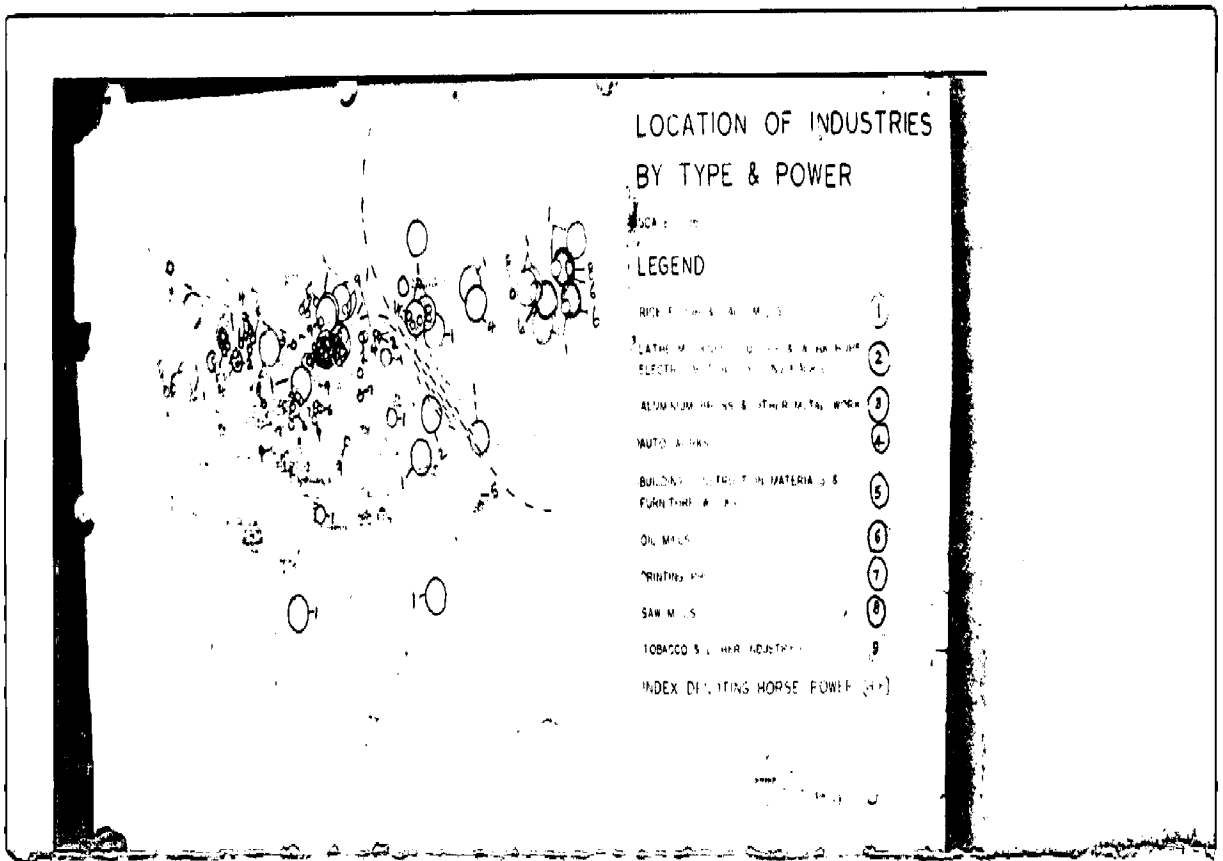


PHOTO. MAP 3. LOCATION OF INDUSTRIES BY TYPE AND POWER

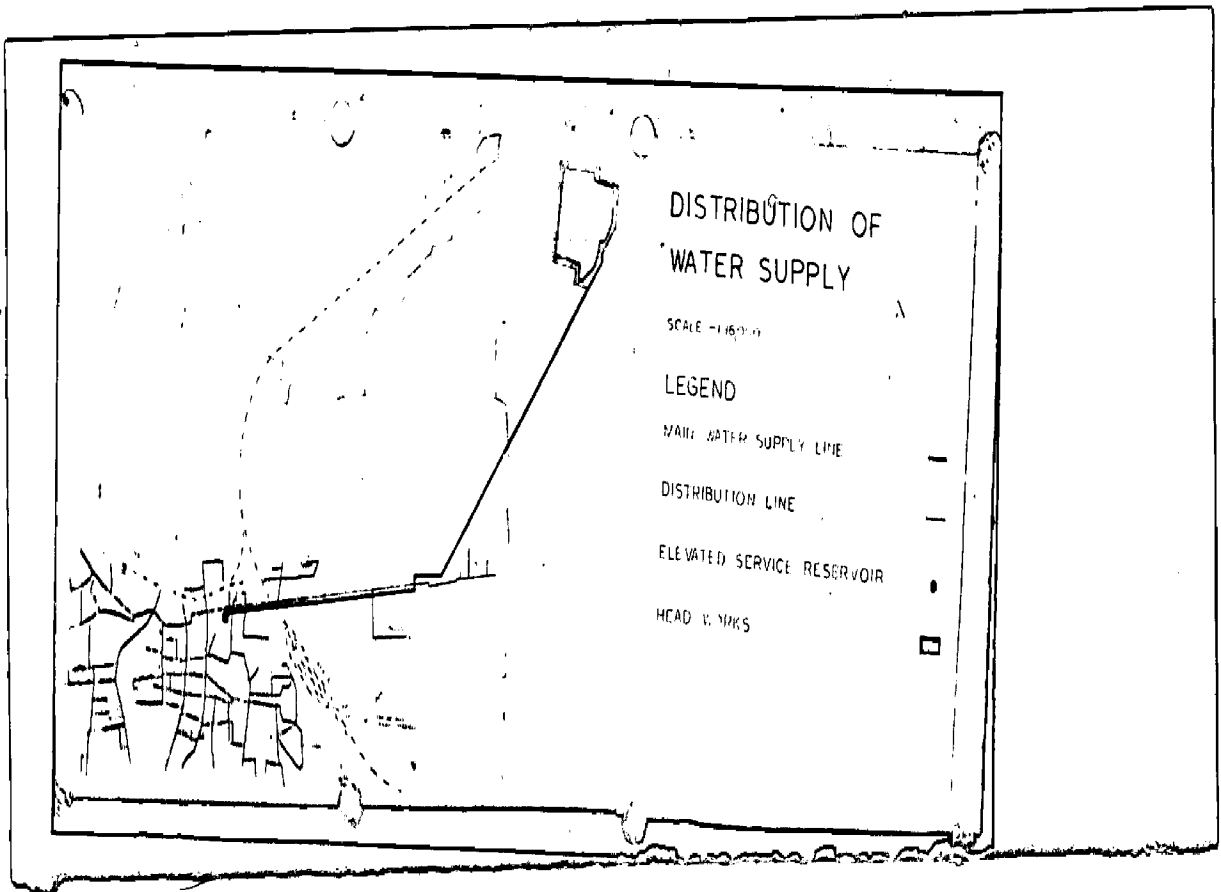
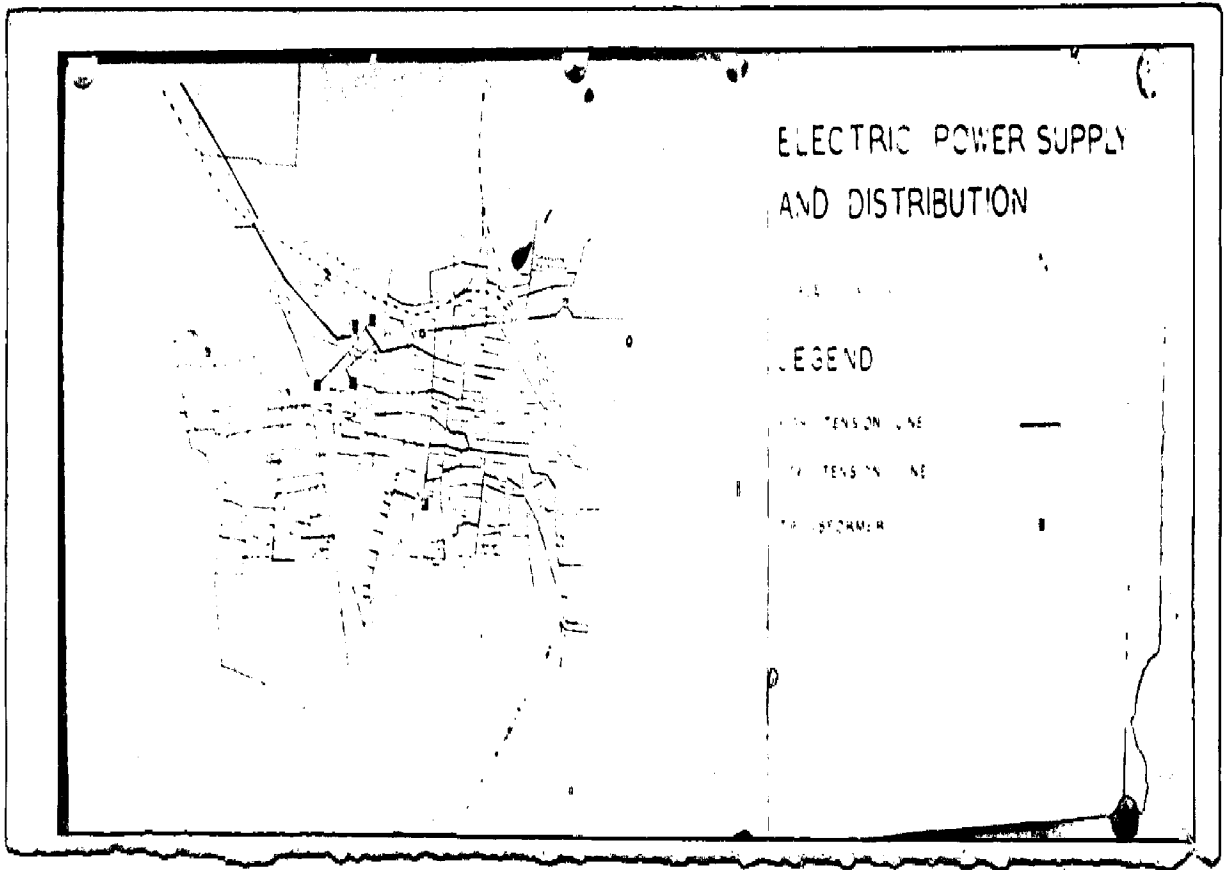


PHOTO. MAP 4. DISTRIBUTION OF WATER SUPPLY



PHOTO, MAP 5. ELECTRIC POWER SUPPLY AND DISTRIBUTION

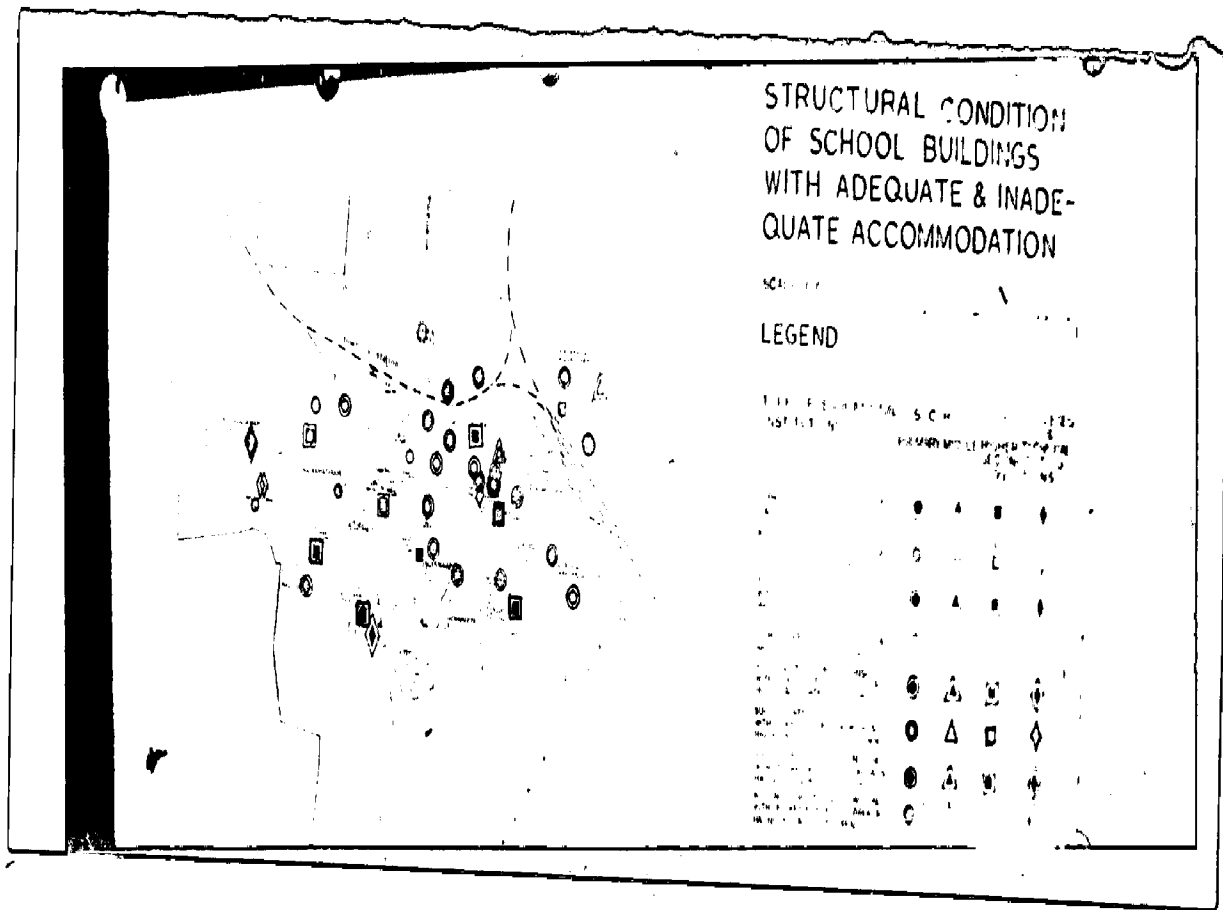


PHOTO. MAP 6. STRUCTURAL CONDITION OF EDUCATIONAL BUILDINGS
WITH ADEQUATE AND INADEQUATE ACCOMMODATION

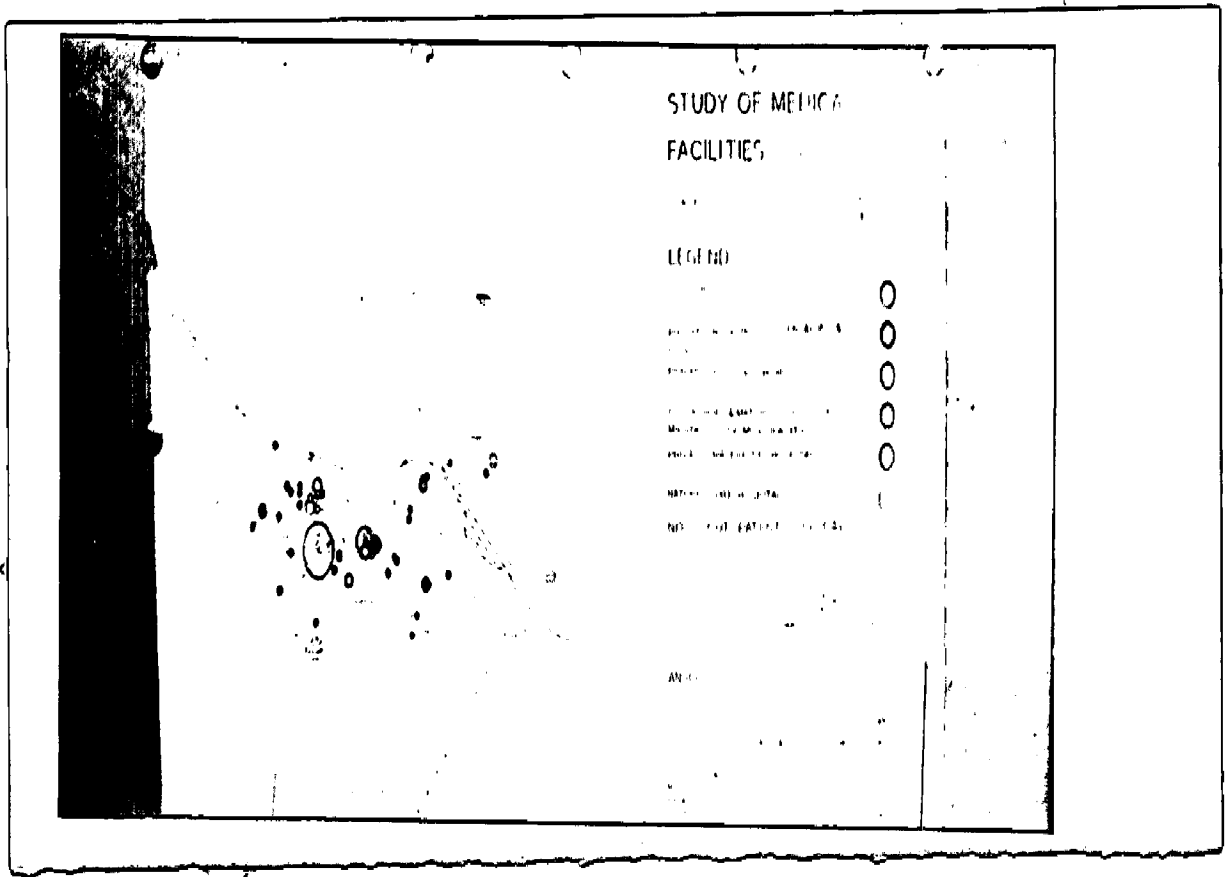


PHOTO. MAP 7. STUDY OF MEDICAL FACILITIES (BY OUT PATIENTS)

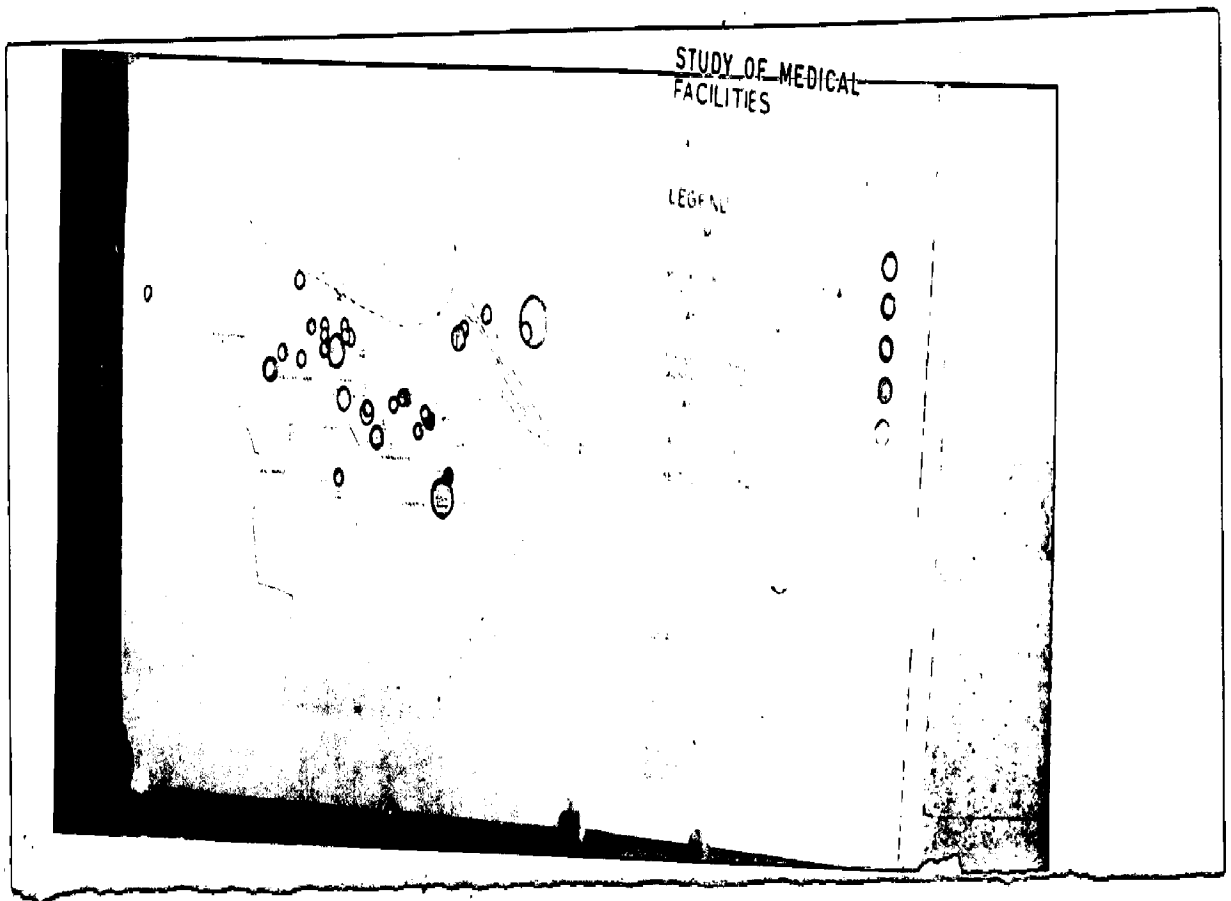
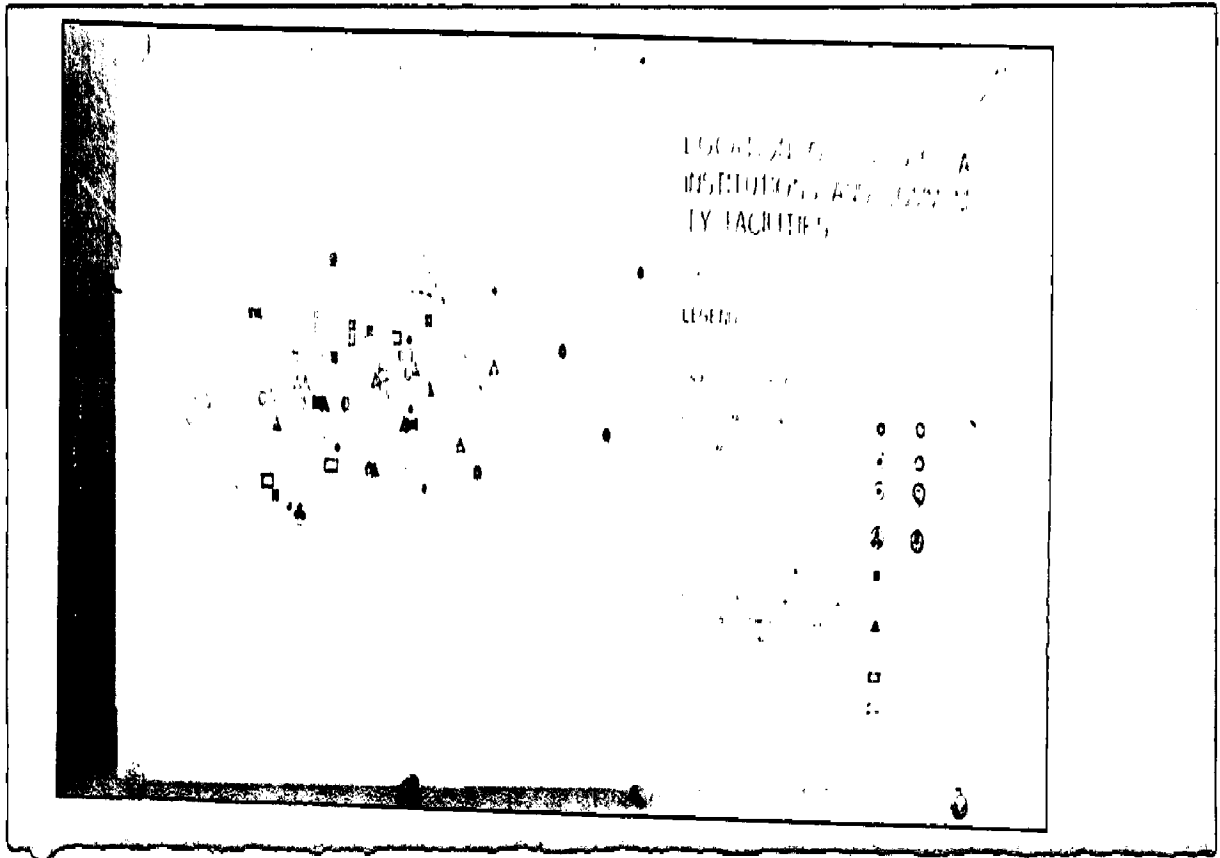


PHOTO. MAP 8. STUDY OF MEDICAL FACILITIES (BY BED STRENGTH)



PHOTO, MAP 9, LOCATION OF COMMUNITY FACILITIES

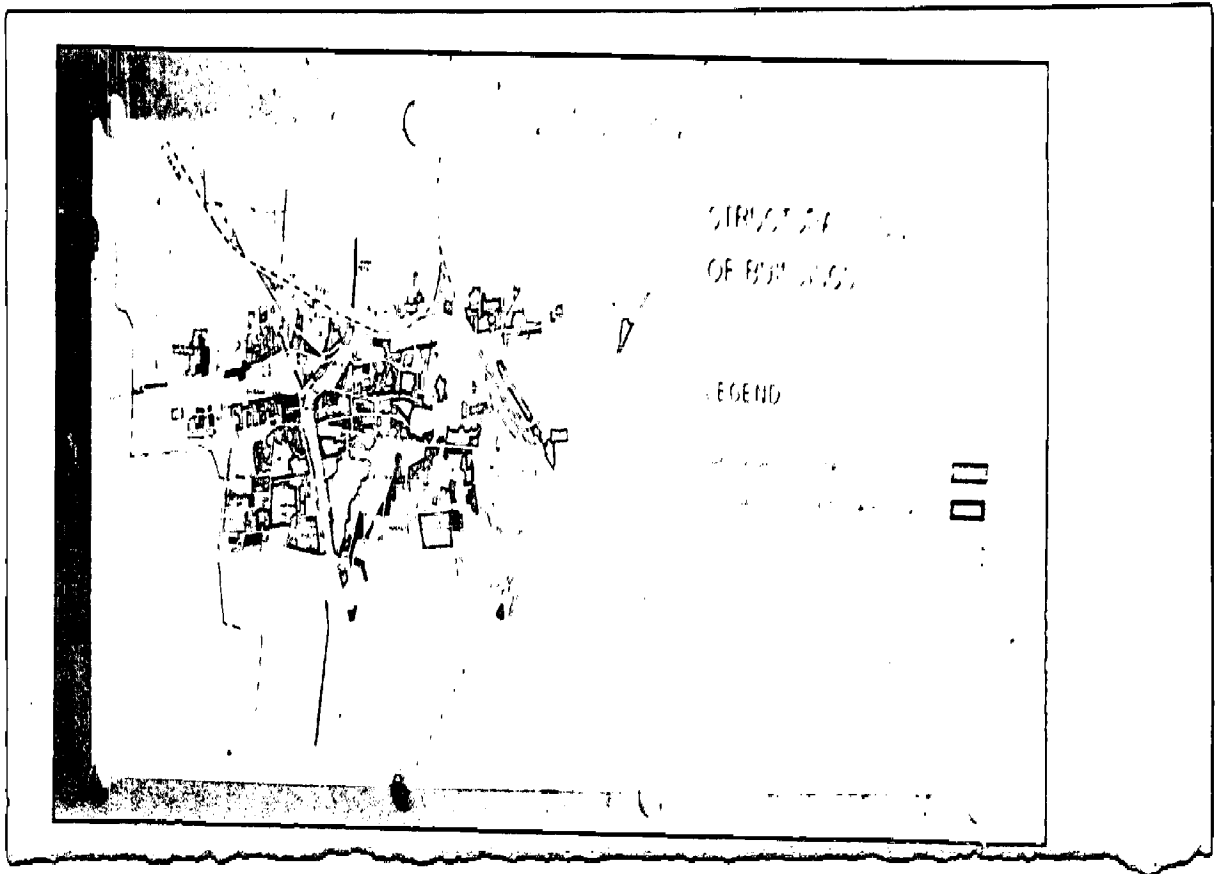


PHOTO MAP 10. STRUCTURAL CONDITION OF BUILDINGS

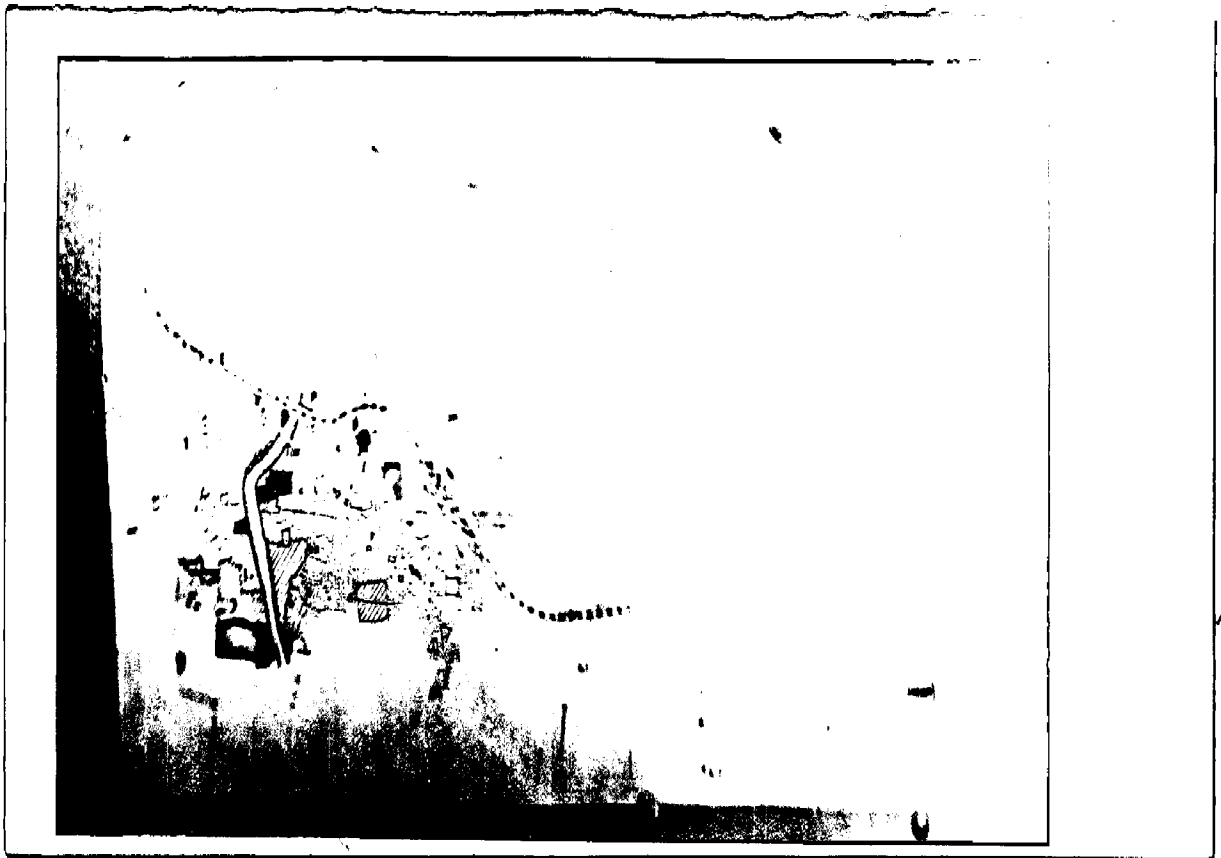
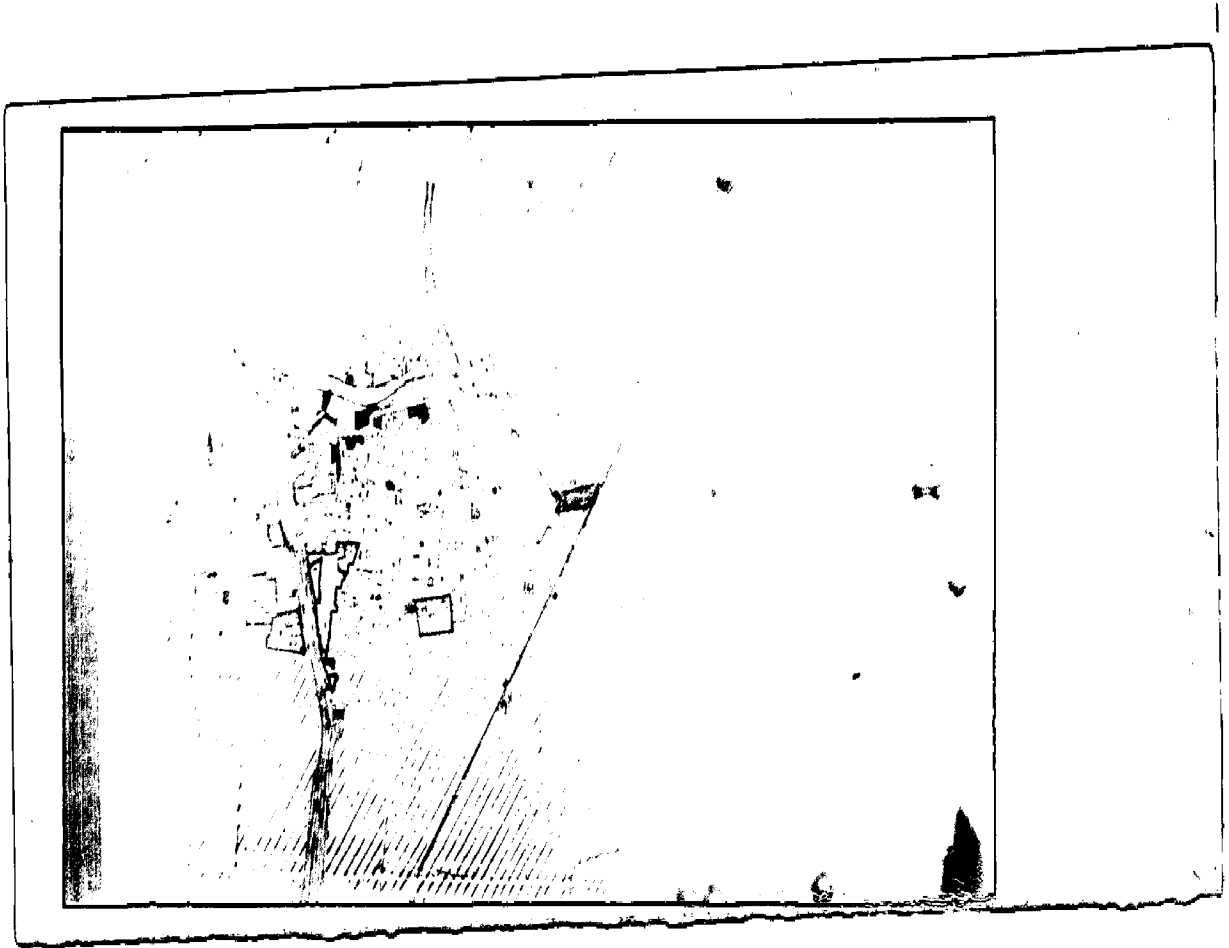


PHOTO. MAP II. LAND OWNERSHIP



PHOTO, MAP 12. EXISTING LAND USE MAP